IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF ILLINOIS

CITY OF GREENVILLE, ILLINOIS *et al.*,	)	
	)	
Plaintiffs,	)	
	)	
v.	)	
	)	Case No. 10-188-JPG-PMF
SYNGENTA CROP PROTECTION, LLC f/n/a	)	
SYNGENTA CROP PROTECTION, INC. *et al.*,	)	
	)	
	)	
Defendants,	)	

DEFENDANT SYNGENTA CROP PROTECTION, LLC'S RESPONSES TO PLAINTIFFS' FIRST INTERROGATORIES DIRECTED TO DEFENDANT SYNGENTA CROP PROTECTION, LLC

COMES NOW Defendant Syngenta Crop Protection, LLC, f/n/a Syngenta Crop Protection, Inc. ("Syngenta"), and for its Responses to Plaintiff's First Interrogatories directed to it, states that its responses to the Interrogatories below remain subject to, and do not waive, any objections asserted by Syngenta in response to similar Requests served in parallel litigation pending in the Circuit Court of Madison County, Illinois, namely *Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al.,* Cause No. 2004-L-000710 (the "*HSSD* case" or "*HSSD* litigation"). Notwithstanding the above, and for its Responses to Plaintiff's First Interrogatories, Syngenta states as follows:

DEFINITIONS

As used in these Requests, the following terms shall have the following meanings:

1. "Atrazine" means 2-chloro-4 ethylamino-6-isopropylamino-s-triazine.

2. "Atrazine related compound" means any of the compounds identified collectively as "related compounds" in the list of active ingredients on an atrazine-containing product's label or packaging.

3. "Atrazine-containing product" means a product in which atrazine is an active ingredient.

4. "Atrazine Degradate(s)" means any of the chemicals into which atrazine breaks down or that are formed by the reaction and/or combination of atrazine or its degradants and other chemicals commonly found in water supplies. These include, but are not limited to:

- deethylatrazine (a/k/a DEA and 2-Amino-4-chloro-6-isopropylamino-s-triazine);
- deisopropylatrazine (a/k/a DIA and 2-Amino-4-chloro-6-ethylamino-s-triazine);
- diaminochloroatrazine (a/k/a DAC or 2,4-Diamino-6-chloro-s-triazine);
- ammeline;
- ammelide;
- n-ethylammelide
- n-isopropylammelide;
- cyanuric acid;
- hydroxyatrazine;
- hydroxideethylatrazine;
- hydroxydeisopropylatrazine; and
- n-nitrosoatrazine:

RESPONSE: Syngenta states that several of the chemicals listed above are not "commonly found in water supplies" as suggested by Plaintiffs. Moreover, although n-nitrosoatrazine is defined as a degradate by plaintiffs, Syngenta states that n-nitrosoatrazine is not a true breakdown product of atrazine.

5. "Date" means the exact day, month, and year, if ascertainable, or if not, a description of the temporal relationship of the occurrence for which the date is sought to the closest dates which are ascertainable.

6. "Defendants" means Syngenta Crop Protection, Inc. and Syngenta AG, and any predecessors, divisions, subdivisions, foreign subsidiaries, foreign subsidiaries of predecessors, domestic or foreign corporate parents, and/or affiliates.

OBJECTIONS: Syngenta objects to this Definition on the grounds that the same is overbroad, burdensome, oppressive, harassing, meant to annoy Syngenta seeks information which is irrelevant and immaterial to any issue in this case, seeks information which is not reasonably calculated to lead to the discovery of admissible evidence at trial,

and seeks information which is beyond the scope of permissible discovery. Certain of the subsidiaries and/or predecessors of Syngenta date back to at least the mid-1700's and it is unreasonable to demand that Syngenta search for responsive information that far back in time. Syngenta further objects to any discovery directed to "all of its and its predecessor companies' direct and indirect domestic and foreign parent companies...and subsidiaries" on the grounds that Plaintiffs have failed to sustain their legally-required burden of demonstrating requisite control by any such entities over Syngenta or Syngenta's control over the documents of any of its "all of its and its predecessor companies' direct and indirect domestic and foreign parent companies...and subsidiaries." Additionally, Syngenta objects to this Definition on the grounds that the same violates the due process rights of any "domestic and foreign parent companies...domestic and foreign subsidiaries... and...independent contractors" of Syngenta, including any such entities located in or organized or existing under the laws of the nation of Switzerland. Syngenta further objects to any discovery related to any entity associated or affiliated with Syngenta which is located or domiciled in Switzerland, as such discovery is violative of various provisions of Swiss law, including, but not limited to, Articles 271 and 273 of the Swiss Penal Code, the Federal Act on Data Protection, and its accompanying Ordinance on the Federal Act on Data Protection.

RESPONSE: Subject to the foregoing objections, without waiving the same, and to protect the Record, Syngenta continues to note it objections to this Definition, its scope, and continues to assert its position that production of documents located in Switzerland is barred (as noted above) to the extent that any such documents cannot be obtained due to computer or IT access limits placed on certain types and categories of information. Syngenta has advised both Plaintiffs of the minimal measures that need to be taken to apply to a Swiss court to obtain release of certain electronic and hard copy documents located therein, but Plaintiffs refuse to engage in such process.

Subject to the foregoing objections, without waiving the same, and subject to the Protective Order entered in this case, Syngenta will produce any non-privileged, relevant and responsive information that is information or documents. Further answering, the correct name of the Defendant is Syngenta Crop Protection, LLC f/n/a Syngenta Crop Protection, Inc.

7. "Document(s)" means documents or electronically-stored information stored in any medium from which information can be obtained either directly or, if necessary, after translation by the responding party into a reasonably usable form, including but not limited to writings, drawings, graphs, charts, photographs, sound recordings, images, other data and data compilations, and information or data that identifies, describes, locates or links to such documents or data, including but not limited to computer and network activity logs, file inventories, file folders, indices, and metadata.

8. "Health effects" means any effect or potential effect, adverse or otherwise, to human health or the health of other living organisms.

9. "Identify" or "state" means provide information with precision and accuracy sufficient,

after reasonable investigation (including but not limited to directing inquiries to your employees and agents and examining documents in your possession, custody or control), to distinguish and describe the subject matter with reasonable specificity. For example:

- For a person – full name, last known address (or date of death, if applicable), employer name and job title.
- For a place – information including but not limited to:
    - state;
    - county, township, city, town, village or other political subdivision;
    - street address;
    - township, range, section and quarter-section;
    - parcel number;
    - latitude and longitude; and
    - GPS coordinates.
- For a date – e.g., year, season or quarter, month, day, time.
- For a document – date, title or subject, description of contents, author(s), recipient(s), custodian(s).
- For data – description, format, date (or date range), source(s), custodian(s).
- For an entity – name, address, principal place of business, state of incorporation (if applicable).

10. "Metabolite" means a breakdown product, intermediate, or other biochemical substance produced by biological processes.

11. "Or" shall be construed either conjunctively or disjunctively to bring within the scope of these Interrogatories any information which might otherwise be construed to be outside their scope.

12. "Study" or "studies" should be understood to include all internal and external studies and all research, surveys, tests, investigations, assessments, drafts and summaries of same and all communications concerning such study or studies.

13. "Water resource" or "water supply" means groundwater, surface water, and/or any system for the provision to the public of water for human consumption.

14. "You," "your," "yours," "Syngenta," or "Syngenta" means the answering defendant and any of its merged, consolidated, or acquired predecessors, divisions, subdivisions, foreign subsidiaries, foreign subsidiaries of predecessors, domestic or foreign corporate parents, and/or affiliates including, but not limited to J.R. Geigy Limited, Ciba Crop Protection, Zeneca Agrochemicals, Ciba-Geigy Limited, and Novartis Agribusiness. This definition includes present or former officers, directors, agents, representatives, employees, and all other persons acting or purporting to act on behalf of Syngenta Crop Protection, Inc., or its predecessors, subsidiaries, and/or affiliates. "Predecessors" means any business firm, whether or not incorporated, which had all or some of its assets purchased or acquired by

Syngenta Crop Protection, Inc., whether by merger, consolidation, or otherwise. "Subsidiaries" further means any business firm, whether or not incorporated, which is or was in any way owned or controlled, in whole or in part, by Syngenta Crop Protection, Inc., or its predecessors. Representative means any partner, agent, employee, consultant, attorney, accountant, or anyone else acting or purporting to act for, at the direction of, or on behalf of another.

OBJECTIONS: See objections and response to Definition 6 above.

1. **INTERROGATORIES**

***NOTES:**

1. Syngenta has heretofore produced ~4.8 Million unique pages of documents in the Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710, litigation. Syngenta designates and stipulates that any documents produced in the HSSD litigation shall be deemed to have been produced in the instant Greenville case as well.

*2. **Additionally, Syngenta is limited in certain respects by its previously produced Records Retention policies as to certain kinds of documents it still has in its possession. Thus, responses to Requests for "any and all documents...." are necessarily limited by the operation and implementation of such policies.***

3. Finally, Syngenta has requested several times pursuant to the Local meet and confer Rules for clarification and limitation of the scope of discovery going forward since its last formal document collection in February, 2010,and while Plaintiffs have advised they would discuss the same but Plaintiffs have failed to respond or clarify. Thus, Syngenta intends to continue with its current and ongoing rolling document production until Plaintiffs provide the requested response and clarification.

1. Identify each person that you have reason to believe may have knowledge of facts and/or possession of information relevant to any of the claims or defenses in this case, and for each such person, describe the knowledge or information you have reason to believe the person may have.

RESPONSE: Syngenta has thousands of employees and it is impossible to identify every employee who has knowledge which Plaintiffs may consider relevant to the claims or defenses in this case. Plaintiff has been provided the organizational structure of Syngenta in prior discovery responses, with the names, titles and departments in which various employees work. Potentially hundreds of employees have some relevant knowledge related to some aspect of either the Plaintiffs' claims or Syngenta's defenses. Additionally, Syngenta has produced and continues to produce millions pages of documents, and many of those documents identify numerous persons with the knowledge of or related to the topics discussed within those same

documents; Syngenta discloses all such persons as persons having some knowledge of relevant facts as requested herein.

Subject to continuing investigation, and reserving the right to amend these responses in the future, Syngenta further identifies the following persons who it believes have knowledge of relevant facts concerning any of the claims or defenses relative to the subject matter involved in this case:

i. Janis McFarland, Ph.D., Head, Regulatory Affairs NAFTA, Syngenta Crop Protection, LLC, Greensboro, NC. Principally involved in atrazine matters since initiation of Special Review in 1994.

ii. Charles Breckenridge, Ph.D., Sr. Science and Technology Fellow, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in toxicological atrazine research.

iii. James Stevens, Ph.D., retired Syngenta employee, NC. Wake Forest University School of Medicine, Winston-Salem, NC. Consultant in ongoing atrazine toxicological research.

iv. Tim Pastoor, Ph.D., Principal Scientist, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in toxicological atrazine research.

v. Dennis Tierney, Ph.D., former Syngenta employee, Greensboro, NC. Involved with atrazine stewardship.

vi. Brian Christensen, BCC, Inc., Minnetonka, MN. Involved with atrazine monitoring and stewardship.

vii. Andrew Merritt, Technical Expert III, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine monitoring.

viii. Peter Hertl, Ph.D., Head, Product Safety Americas, Syngenta Crop Protection, LLC. Involved in atrazine research and monitoring.

ix. David Volz, Ph.D., former Syngenta employee, University of South Carolina, Columbia, SC. Involved in toxicological atrazine research.

x. David Flakne, Sr. State Government Relations Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship.

Responsible for state government relations in various states, including Iowa, Illinois, Indiana and Ohio.

xi. Alan Hosmer, Technical Expert V, Syngenta Crop Protection, LLC, Greensboro, NC, Involved in toxicological atrazine research.

xii. Ron Williams, Ph.D., Stewardship Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship.

xiii. Dan Campbell, Regulatory Affairs Team Leader, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine registration.

xiv. John Licata, Operational HSE & QA Head, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in manufacturing worker safety.

xv. John Stone, Ph.D., former Syngenta employee. Involved in manufacturing worker safety.

xvi. John Davis, Global Product Supply Chain Manager, Triazines and Chlorothalonil, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with triazine product supply and FIFRA 7 reports re triazines.

xvii. Kevin Gesse, Brand Manager CM3, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with strategies for herbicide marketing and purchases of atrazine by Syngenta.

xviii. Ken Fister, Head-Herbicide Brand Management, Syngenta Crop Protection, LLC, Greensboro, NC. Manages all herbicides; involved with marketing, distribution and sale of atrazine.

xix. Travis Dickinson, Head-Marketing, Syngenta Crop Protection, LLC, Greensboro, NC. Manages all herbicides; involved with marketing, distribution and sale of atrazine.

xx. Scott Langkamp, Head, Horticulture, Syngenta Crop Protection, LLC, Greensboro, NC. Predecessor to Mr. Fister; involved with marketing, distribution and sale of atrazine.

xxi. Dennis Kelly, State Affairs Team Lead, Syngenta Crop Protection, LLC, Greensboro, NC. Oversees state government relations on behalf of Syngenta; involved in atrazine stewardship; interacts with various agricultural, trade, and industry third parties and groups.

xxii. Todd Barlow, State Government Relations Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship;

responsible for state government relations in various states, including Missouri, Kansas, and Nebraska.

xxiii. Danelle Farmer, Senior State Government Relations Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship; responsible for state government relations in various states, including Louisiana.

xxiv. Jessica Adelman, Head Corporate Affairs, Syngenta America, Inc. Involved with lobbying and communications activities.

xxv. Angus Kelly. Head, Federal Relations, Syngenta America, Inc. Involved in lobbying activities on behalf of Syngenta.

xxvi. Lloyd Day. Former Head, US Government Affairs, Syngenta America, Inc. Involved in lobbying activities on behalf of Syngenta.

xxvii. Paul Hendley, Senior Science & Technology Fellow, Product Safety, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with ecological studies, fate and transport, and certain SAP hearings/matters.

xxviii. Chris Harbourt, Adjunct Assistant Professor, Agriculture & Bioengineering, University of Illinois, and Principal Engineer for Waterbourne Environmental, Inc., Champaign, IL. Involved in the development and application of modeling and the application of field instrumentation technology to address chemical partitioning, degradation, and dispersion on atypical and complex urban and agricultural settings.

xxix. Sherry Ford, former Community Outreach, former Senior Communications Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Previously involved with media and communications.

xxx. Steven Goldsmith, former Senior Communications Manager at Syngenta Crop Protection, LLC, Greensboro, NC; currently employed at Syngenta Bio-Technology, Inc., Research Park Triangle, NC. Previously involved with media and communications.

xxxi. Ann Bryan, Senior Manager, External Communications-Crop Protection, Greensboro, NC. Involved with media and communications.

xxxii. Gene Hill, former Syngenta Crop Protection, Inc., employee now with Olsten Staffing for assigned activities within Syngenta Crop Protection, LLC, Greensboro, NC, including biological data summarization, EPA registration activities for multiple active ingredients, source of historical information.

xxxiii. Dennis Hackett, Team Lead Compliance and Regulatory Support, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in regulatory compliance.

xxxiv. Jim Wojciak, Senior Technical Manager, Technical Support, Customer Care, Commercial Operations, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in customer contact, service and complaints.

xxxv. Eric Kuhn, former Atrazine Project Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Liaison between NAFTA and Global re ATZ including the lawsuit.

xxxvi. Harvey Minnick, Global Manager Data Privacy/Records, Records Retention, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with records retention.

xxxvii. Rex Martin, Industry Affairs Lead II, Communications/Public Affairs, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship; interacts with various agricultural, trade, and industry third parties and groups.

xxxviii. Nina Heard, Science & Technology Fellow, Operator & Consumer Risk Assessment, Syngenta Crop Protection, LLC, Greensboro, NC. Knowledgeable re atrazine chemistry and breakdown products.

xxxix. Madan Verma, Analytical Manager, Analytical and Product Chemistry, Technology/Products, Syngenta Crop Protection, LLC, Greensboro, NC.

xl. Gordon Vail, Senior Technical Brand Manager, Technical Support, Customer Care, Commercial Operations, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in application technology.

xli. Chuck Forsman, Senior Technical Brand Manager, Herbicide Brand Management, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in application technology.

xlii. Tom Parshley, Senior 1 Regulatory Product Manager, Professional Products, Regulatory Affairs; former Senior Regulatory Manager, Regulatory Affairs, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in product registrations and regulatory support therefor.

xliii. Steven Wall, Technical Leader II, Greensboro, NC. Involved in environmental safety.

xliv. Larry Gasper, Science and Technology Fellow, Greensboro, NC. Knowledgeable re atrazine chemistry and breakdown products.

xlv. Growmark employees whose names have been disclosed in Growmark's documents and responses to discovery requests may have the knowledge of relevant facts described in said documents or discovery responses.

xlvi. Any employees or witnesses disclosed in either documents produced or discovery responses by the registrants in the companion *Holiday Shores Sanitary District* litigation may have the knowledge of relevant facts described in said documents or discovery responses.

xlvii. Any employees, agents or witnesses of the named Plaintiffs may have knowledge of relevant facts.

xlviii. Any employees, agents or witnesses of the named Plaintiffs disclosed in either their public web sites, documents produced or discovery responses by said Plaintiffs may have the knowledge of relevant facts described in said web sites, documents or discovery responses.

xlix. Any employees, agents or witnesses of the putative class members may have knowledge of relevant facts.

l. Any employees, agents or witnesses of the putative class members disclosed in either their public web sites, documents produced or discovery responses by said Plaintiffs may have the knowledge of relevant facts described in said web sites, documents or discovery responses.

2. Identify the Syngenta officer, employee or agent who, as of the date of your answers to these interrogatories, has the most knowledge regarding:

a. The purchase by Syngenta of atrazine and/or atrazine-containing products;

b. The formulation by Syngenta of atrazine and/or atrazine-containing products;

c. The marketing by Syngenta of atrazine and/or atrazine-containing products;

d. The distribution by Syngenta of atrazine and/or atrazine-containing products;

e. The sale by Syngenta of atrazine and/or atrazine-containing products;

f. The application by Syngenta or Syngenta customers of atrazine and/or atrazine-containing products, including the locations of applications and quantities applied;

g. The purchase, formulation, marketing, distribution, sale and/or application (including but not limited to locations of applications and quantities applied) of atrazine and/or atrazine-containing products by customers of Syngenta;

h. Precision farming and other custom application planning and/or application services offered by Syngenta, including but not limited to knowledge about the nature and location of information and data regarding atrazine and/or atrazine-containing-product application rates and locations obtained in connection with the provision of such services;

i. The collection of information and keeping of records by Syngenta and Syngenta customers regarding sales and applications of atrazine and atrazine-containing-products for the purpose of compliance with 8 Illinois Administrative Code Section 250.150 and similar regulations of other states;

j. The registration and regulation of atrazine and atrazine-containing products as restricted-use pesticides under federal and state law;

k. Syngenta's policies and procedures regarding the registration, licensing and/or certification of employees of Syngenta and Syngenta customers to manufacture, formulate, distribute, sell, purchase and/or apply atrazine and/or atrazine-containing products;

l. Complaints received by Syngenta about atrazine, atrazine-containing products and/or atrazine degradates or metabolites;

m. Health and environmental safety issues with respect to atrazine, atrazine-containing products and/or atrazine degradates or metabolites, including but limited to issues regarding the health effects of and/or contamination of water sources or water supplies by such substances.

RESPONSE: Syngenta has thousands of employees and it is impossible to identify every employee who has knowledge which Plaintiffs may consider relevant to the claims or defenses in this case. Plaintiff has been provided the organizational structure of Syngenta in prior discovery responses, with the names, titles and departments in which various employees work. Potentially hundreds of employees have some relevant knowledge related to some aspect of either the Plaintiffs' claims or Syngenta's defenses. Additionally, Syngenta has produced and continues to produce millions pages of documents, and many of those documents identify numerous persons with the knowledge of or related to the topics discussed within those same documents; Syngenta discloses all such persons as persons having some knowledge of relevant facts as requested herein.

Subject to continuing investigation, and reserving the right to amend these responses in the future, see response to Interrogatory 1 above. Further responding, Syngenta states:

a. With respect to the purchase by Syngenta of atrazine and/or atrazine-containing products: Alan Camp, Ken Fister and Kevin Gesse.

b. With respect to the formulation by Syngenta of atrazine and/or atrazine-containing products: Madan Verma.

c. With respect to the marketing by Syngenta of atrazine and/or atrazine-containing products: Travis Dickinson, Ken Fister and Scott Langkamp.

d. With respect to the distribution by Syngenta of atrazine and/or atrazine-containing products: Ken Fister and Scott Langkamp.

e. With respect to the sale by Syngenta of atrazine and/or atrazine-containing products: Ken Fister and Scott Langkamp.

f. With respect to the application by Syngenta or Syngenta customers of atrazine and/or atrazine-containing products, including the locations of applications and quantities applied: Dan Kidder, Gordon Vail, Chuck Forsman and Gene Hill.

g. With respect to the purchase, formulation, marketing, distribution, sale and/or application (including but not limited to locations of applications and quantities applied) of atrazine and/or atrazine-containing products by customers of Syngenta: See Responses above re each such category.

h. With respect to precision farming and other custom application planning and/or application services offered by Syngenta, including but not limited to knowledge about the nature and location of information and data regarding atrazine and/or atrazine-containing-product application rates and locations obtained in connection with the provision of such services: The phrase/term "precision farming" is very broad and vague, and no definition is provided by plaintiffs. Syngenta identifies Dan Kidder, Gordon Vail and Chuck Forsman as being involved in the application, use of, practices regarding and technology and equipment behind various application techniques.

i. With respect to the collection of information and keeping of records by Syngenta and Syngenta customers regarding sales and applications of atrazine and atrazine-containing-products for the purpose of compliance with 8 Illinois Administrative Code Section 250.150 and similar regulations [undefined by plaintiffs] of other states: Syngenta states that the administrative regulation referenced herein applies only to dealers and

applicators, not registrants, so Syngenta is not required to comply and no such information or records are kept in that regard by Syngenta.

j. With respect to the registration and regulation of atrazine and atrazine-containing products as restricted-use pesticides under federal and state law: Janis McFarland.

k. With respect to Syngenta's policies and procedures regarding the registration, licensing and/or certification of employees of Syngenta and Syngenta customers to manufacture, formulate, distribute, sell, purchase and/or apply atrazine and/or atrazine-containing products: Janis McFarland.

l. With respect to complaints received by Syngenta about atrazine, atrazine-containing products and/or atrazine degradates or metabolites: Jim Wojciak and Dennis Hackett.

m. With respect to health and environmental safety issues with respect to atrazine, atrazine-containing products and/or atrazine degradates or metabolites, including but limited to issues regarding the health effects of and/or contamination of water sources or water supplies by such substances:

OBJECTION: Syngenta objects to the term "environmental safety" on the grounds that it is vague, ambiguous and undefined. Subject to the foregoing objections, and without waiving the same, Syngenta identifies the following persons with general knowledge Charles Breckenridge and Tim Pastoor (health) and Peter Hertl (ecological monitoring) and Andrew Merritt (community water system monitoring programs).

3. Identify each Syngenta officer, employee or agent who, as of the date of your answers to these interrogatories, has possession, custody or control of documents and/or information regarding:

a. The purchase by Syngenta of atrazine and/or atrazine-containing products;

b. The formulation by Syngenta of atrazine and/or atrazine-containing products;

c. The marketing by Syngenta of atrazine and/or atrazine-containing products;

d. The distribution by Syngenta of atrazine and/or atrazine-containing products;

e. The sale by Syngenta of atrazine and/or atrazine-containing products;

f. The application by Syngenta or Syngenta customers of atrazine and/or atrazine-containing products, including the locations of applications and quantities applied;

g. The purchase, formulation, marketing, distribution, sale and/or application (including but not limited to locations of applications and quantities applied) of atrazine and/or atrazine-containing products by customers of Syngenta;

h. Precision farming and other custom application planning and/or application services offered by Syngenta, including but not limited to knowledge about the nature and location of information and data regarding atrazine and/or atrazine-containing-product application rates and locations obtained in connection with the provision of such services;

i. The collection of information and keeping of records by Syngenta and Syngenta customers regarding sales and applications of atrazine and atrazine-containing-products for the purpose of compliance with 8 Illinois Administrative Code Section 250.150 and similar regulations of other states;

j. The registration and regulation of atrazine and atrazine-containing products as restricted-use pesticides under federal and state law;

k. Syngenta's policies and procedures regarding the registration, licensing and/or certification of employees of Syngenta and Syngenta customers to manufacture, formulate, distribute, sell, purchase and/or apply atrazine and/or atrazine-containing products;

l. Complaints received by Syngenta about atrazine, atrazine-containing products and/or atrazine degradates or metabolites;

m. Health and environmental safety issues with respect to atrazine, atrazine-containing products and/or atrazine degradates or metabolites, including but limited to issues regarding the health effects of and/or contamination of water sources or water supplies by such substances.

RESPONSE: See responses to Interrogatories 1 and 2 above. Syngenta has approximately 9,000 employees in the United States. The persons identified in response to Interrogatories 1 and/or 2 have had or still may have documents related to the categories listed above. Obviously, co-workers of those persons in the departments/areas referenced may also have possession of documents or records related to the categories above. Plaintiffs have been provided an organizational chart that details the roles of the various persons working in different departments who may also have custody to certain documents which relate to their assigned tasks.

4. For each year from the year in which you first sold atrazine or any atrazine-containing product through the present, identify (including the person's position or job title):

a. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the purchase by Syngenta of atrazine and/or atrazine-containing products;

b. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the formulation by Syngenta of atrazine and/or atrazine-containing products;

c. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the marketing by Syngenta of atrazine and/or atrazine-containing products;

d. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the distribution by Syngenta of atrazine and/or atrazine-containing products;

e. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the sale by Syngenta of atrazine and/or atrazine-containing products;

f. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the application by Syngenta of atrazine and/or atrazine-containing products, including the locations of applications and quantities applied;

g. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the purchase, formulation, marketing, distribution, sale and/or application (including but not limited to locations of applications and quantities applied) of atrazine and/or atrazine-containing products by Syngenta customers;

h. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing precision farming or other custom application planning and/or application services offered by Syngenta or Syngenta customers;

i. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the collection of information and keeping of records by Syngenta and Syngenta customers regarding sales and applications of atrazine and atrazine- containing-products for the purpose of compliance with 8 Illinois Administrative Code Section 250.150 and similar regulations in other states;

j. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing Syngenta's activities with respect to the registration and regulation of atrazine and atrazine-containing products as restricted-use pesticides under federal and state law;

k. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the registration, licensing and/or certification of employees of Syngenta and its customers to manufacture, formulate, distribute, sell, purchase and/or apply atrazine and/or atrazine-containing products;

l. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing the handling of complaints received by Syngenta or about atrazine, atrazine-containing products and/or atrazine degradates or metabolites;

m. Your officer, employee or agent with primary responsibility for managing, supervising and/or overseeing health and environmental safety issues with respect to atrazine, atrazine-containing products and/or atrazine degradates or metabolites, including but limited to issues regarding the health effects of and/or contamination of water sources or water supplies by such substances.

RESPONSE: Syngenta objects to Interrogatory 4 on the grounds that it is burdensome, oppressive, harassing, impossible and unreasonable to have to investigate or respond to Interrogatory 4 to the extent it seeks information over a period of 50+ years. Subject to the foregoing objections and without waiving the same, see responses to Interrogatories 1 and 2 above. Syngenta has approximately 9,000 employees in the United States and its records retention policies preclude the maintenance of records that span the 50+ years during which atrazine was sold.. Plaintiff has been provided an organizational chart that details the roles of the various persons working in different departments who may also have custody to certain documents which relate to their assigned tasks, and Syngenta does not keep old organizational charts as a matter of routine business practice. If Plaintiffs can provide specific departments in which they have a particular inquiry, Syngenta will attempt to accommodate such limited inquiries.

5. For each atrazine-containing product that you have sold to other herbicide, pesticide, or other chemical manufacturers, distributors, producers, co-ops, or wholesalers, identify:

a. The name, address, and location of the purchaser of atrazine, each atrazine-containing product, and/or each constituents of such products;

b. The corresponding identity of the product, including: (1) chemical composition; (2) form in which product was sold (e.g., liquid, mixable powder, flowable powder); (3) brand name; and (4) EPA registration number;

c. The person or group within Syngenta that first made or approved the decision to begin selling the product and when that decision was made;

d. The date on which you began, and if applicable, stopped selling the product or any part thereof, why you stopped, and who made the decision to stop;

e. The corresponding quantities of each product sold;

f. The corresponding date that each entity purchased the product(s);

g. The name of each product that the purchaser manufactured, marketed, and/or sold as a result of their purchase from you;

h. The product(s) for which it is intended to be used with, or mixed, blended or made into;

i. The geographic markets (i.e., country, state, county, city, watershed) in which each product was sold or used (including the corresponding dates);

j. For each year during the period of sale, state the quantities of the product that were applied or sold for application at particular locations; and

k. For each year during the period of sale, state the amount of revenue and profit you received from sales of the product.

RESPONSE: Syngenta became the sole supplier of Atrazine to Dow in approximately August 2006. Syngenta currently sells Atrazine to BASF, Dow, Bayer, DuPont, and Monsanto, among others. With respect to sales by Syngenta to different entities, see attached National Pesticide Information Retrieval System ("NPIRS") Database **exhibit** regarding all Atrazine and Atrazine-containing product registrations from 1959-present.

a. Information re the purchasers of Syngenta's atrazine or atrazine-containing products has been previously produced and Syngenta will produce any additional updated. non-privileged, relevant, and responsive information or documents that have not already been produced in the instant case or in the Holiday Shores Sanitary District, et al. v. Syngenta Crop Protection, LLC, et al. litigation.

b. Syngenta refers the Plaintiff to the NPIRS Database, via which Plaintiff can conduct various searches regarding Syngenta and its registrations of Atrazine and Atrazine-containing products. For purposes of conducting searches, the registration numbers for Syngenta and its legacy companies are 100 and 10182. Using this publicly available database with the registration numbers of 100 and 10182, Plaintiff can access information as to atrazine products sold by name, but Syngenta considers the same **Confidential and Subject to the Protective Order** in this case as this is a proprietary database for which a fee is paid to NPIRS and Syngenta does not have a license that would allow it to provide the information to third parties voluntarily.

To look up any/all atrazine registrations, Syngenta provides directions which are bolded and underlined; the balance of the information provided is from the actual NPIRS site.

Go to: http://ppis.ceris.purdue.edu/

You will see this on the screen:

The following queries were developed using U.S.EPA/OPP's PPIS databases:

- OPP's registered and cancelled pesticide product database (product name search)
- OPP's chemical ingredients database (chemical nomenclature, current products and registrants)
- OPP's company information database
- If you know the EPA registration number, you may view the OPP's product labels at the Pesticide Product Label System (PPLS).

Click on the 4th bullet (Pesticide Product Label System (PPLS))

It will take you to this screen:

Enter EPA Pesticide Product Registration Number:

Company Number - Product Number

-

For Syngenta Crop Protection, LLC's atrazine products enter 100 for the company number and 497 for the product number and it will take you to this screen (below is just part of the screen):

COMPANY NUMBER	PRODUCT NUMBER	IMAGE SIZE	APPROVAL (DESCENDING)	DATE
100	497	1498430	18-JUL-2005	
100	497	1533336	14-SEP-2004	
100	497	1585006	11-AUG-2004	
100	497	1348364	06-OCT-2003	

COMPANY NUMBER	PRODUCT NUMBER	IMAGE SIZE	APPROVAL (DESCENDING)	DATE
100	497	813720	16-MAR-2001	
100	497	1251392	28-SEP-2000	

You can click on any of the dates and find the dates and documents for the Syngenta products.

To look up other atrazine registrations/registrants go back to the NPIRS first page and click on the second bullet

OPP's chemical ingredients database (chemical nomenclature, current products and registrants)

You will see this screen

Chemical Ingredients

Search for chemicals by a PC codes, Chemical Abstract Services (CAS) numbers, or partial names.

Top of Form

This query yields information on pesticide chemical ingredients that meet the criteria you enter below. The PC code is OPP's unique chemical identifier. To enter multiple numbers or names, separate them with a comma. For product name or trade name, use query on prior page.

☐ Search by PC codes, CAS numbers or partial names:

Enter atrazine a hit "query"
You will see this screen which defaults to "active registrations. If you want all registrations go to the bottom of this screen and click on "All Registrants"

- PC Code: 80803

Display: Active Registrants Only All Registrants

When you click on "All Registrants" and Click "Get Company Info" you will see the following screen (the entire list is not pasted). On this screen under each

registrant you can select either "Active Product Only" or "All Products" to get everything.

Company Information

PC Code:		80803	
Chemical Number	of	Name: Registrants:	Atrazine 117

Represents a link to a registrant list for this chemical.
<hr size=2 width="70%" noshade style='color:black' align=center>.

Firm Number: 100
SYNGENTA CROP PROTECTION, INC.
PO BOX 18300
GREENSBORO NC 27419
336/632-2473

Display: Active Products Only All Products

Further responding, see the Confidential Statements of Formula previously produced in the *Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al.*, Cause No. 2004-L-000710, litigation (which identify the permitted constituents in Syngenta's Technical Atrazine), and the "Manufacturing Process" and Formation of By-Products" documents to be produced, all of which are "Confidential Business Information" pursuant to FIFRA and are designated as **Confidential and Subject to the Protective Order** entered in this case.

c. Syngenta cannot identify any single person or group who made the decision to begin selling atrazine.

d. Atrazine was registered in the United States in 1958 and was first sold by predecessors of Syngenta at some places in the United States in 1959. Atrazine and atrazine-containing products are still sold in the United States today.

e. Syngenta will produce any additional updated. non-privileged, relevant, and responsive information or documents re quantities sold that have not already been produced in the instant case or in the Holiday Shores Sanitary District, et al. v. Syngenta Crop Protection, LLC, et al. litigation.

f. Syngenta will produce any additional updated. non-privileged, relevant, and responsive information or documents re dates of sale that have not already been produced in the instant case or in the Holiday Shores Sanitary District, et al. v.

Syngenta Crop Protection, LLC, et al. litigation.

g. Syngenta will produce any additional updated. non-privileged, relevant, and responsive information or documents re names of products sold that have not already been produced in the instant case or in the Holiday Shores Sanitary District, et al. v. Syngenta Crop Protection, LLC, et al. litigation.

h. This Interrogatory is vague and confusing, but answering as Syngenta understands the question, the Atrazine product labels provide examples of tank mixes with which the product can be used. The product can be mixed with any product/compound not precluded by the Syngenta label if another company's label permits such use. The product labels contain this information. Specific directions can be given on how to mix the brand with other herbicide brands in tank mixtures. Where appropriate, sequential applications are specified. Other statements may appear specifying not to mix with any product unless specified on the label, or the brand may be mixed with any brand labeled for the specific use pattern. Further responding, Atrazine is used in a variety of mixtures and pre-pack products, including those set forth below:

Atrazine* and Atrazine-Containing Products Registered by Syngenta Crop and Its Predecessors (Geigy, Ciba-Geigy, Ciba Crop Protection, Novartis and Syngenta Crop Protection, Inc.) Include:

Registered Product Name	EPA Reg. No.
Aatrex 4l herbicide	100-497
Aatrex 4l tank mix with princep 80 & paraquat cl corn	100-9218
Aatrex 4lc	100-535
Aatrex 4lc	100-4285
Aatrex 4l-corn	100-4263
Aatrex 4l-corn	100-4274
Aatrex 4l-corn	100-4308
Aatrex 4l-sugarcane	100-4284
Aatrex 5l	100-621
Aatrex 80 w-corn	100-4261
Aatrex 80 w-corn	100-4309
Aatrex 80w	100-4286
Aatrex 80w	100-4290
Aatrex 80w	100-4306
Aatrex 80w herbicide	100-439
Aatrex 80w weeds	100-7441
Aatrex 80w-corn	100-4275
Aatrex 8g herbicide	100-660
Aatrex 90 wp	100-572
Aatrex 90w herbicide	100-630

Aatrex accu-pak	100-756
Aatrex nine-0 herbicide	100-585
Aatrex rp4l	100-581
Aatrex-propachlor herbicide mixture	100-513
Atra-bor 8p granular herbicide	100-447
Atratol 80w herbicide	100-503
Atratol 8p pelleted herbicide	100-475
Atratol 90	100-622
Atrazine base mix manufacturing use product	100-1235
Atrazine mg80 for manufacturing use only	100-521
Atrazine technical	100-529
Atrazine technical	100-1207
Atrazine wet paste manufacturing use product	100-1236
Bicep 4.5l	100-590
Bicep 4.5l herbicide	100-623
Bicep df herbicide	100-748
Bicep herbicide	100-645
Bicep ii herbicide	100-710
Bicep ii magnum herbicide	100-817
Bicep ii magnum manufacturing use product	100-1214
Bicep lite herbicide	100-731
Bicep lite ii herbicide	100-766
Bicep lite ii magnum herbicide	100-827
Bicep lite ii magnum manufacturing use product	100-1213
Bicep magnum	100-886
Bicep magnum tr herbicide	100-928
Brawn herbicide	100-1165
Expert herbicide	100-1161
Expert nt herbicide	100-972
Lexar herbicide	100-1201
Lumax selective herbicide	100-1152
Primaze 80w herbicide	100-492
Prosulfuron + atrazine herbicide	100-956
Tritol	100-637
AAtram 20G Herbicide	100-519
SYN-A17227	100-1356
Callisto Xtra	100-1359

*In some instances Syngenta sells the Atrazine Technical to another company who then formulates it into their product.

i. The product labels specify some of the agricultural areas/crops/soil types in which the product can be used. As Syngenta interprets this Interrogatory, the label use pattern shows the crops for which the product is labeled and on which crops it can be used after registration/approval in each such state. Further responding,

additional information regarding this Interrogatory can be obtained for a fee from the GfK Kynetec service, (formerly Doane's AgroTrak), accessible at http://www.gfk.com/gfk-kynetec/). Further responding, Syngenta is making provisions to produce to plaintiffs all Doane/GfK data runs it has in its possession that were conducted by or at the request of Gary Gries and/or Gene Hill related to atrazine.

j. See response to sub-part e. above. Additional information regarding this Interrogatory can be obtained for a fee from the GfK Kynetec service, (formerly Doane's AgroTrak), which was previously identified in Syngenta's discovery responses in the Holiday Shores Sanitary District v. Syngenta Crop Protection, LLC, Case no. 04-L 00710, and is accessible at http://www.gfk.com/gfk-kynetec/). Further responding, Syngenta is making provisions to produce to plaintiffs all Doane/GfK data runs it has in its possession that were conducted by or at the request of Gary Gries and/or Gene Hill related to atrazine.

k. See the Syngenta Atrazine Brands Standard Cost and Net Selling Price document for 2001-2008, which has been previously produced to Plaintiffs. Syngenta will produce any additional updated. non-privileged, relevant, and responsive information or documents re costs and pricing that have not already been produced in the instant case or in the Holiday Shores Sanitary District, et al. v. Syngenta Crop Protection, LLC, et al. litigation.

Syngenta's investigation continues for additional information responsive to this Interrogatory and it will continue its rolling production of documents in the Holiday Shores litigation, which documents are also responsive to Plaintiffs' discovery requests herein..

6. For each atrazine-containing [product] that you have sold not otherwise identified in response to Interrogatory No. 5, identify:

a. The name, address, and location of the purchaser of atrazine, each atrazine-containing product, and/or each constituents of such products;

b. The corresponding identity of the product, including: (1) chemical composition; (2) form in which product was sold (e.g., liquid, mixable powder, flowable powder); (3) brand name; and (4) EPA registration number;

c. The person or group within Syngenta that first made or approved the decision to begin selling the product and when that decision was made;

d. The date on which you began, and if applicable, stopped selling the product or any part thereof, why you stopped, and who made the decision to stop;

e. The corresponding quantities of each product sold;

f. The corresponding date that each entity purchased the product(s);

g. The name of each product that the purchaser manufactured, marketed, and/or sold as a result of their purchase from you;

h. The product(s) for which it is intended to be used with, or mixed, blended or made into;

i. The geographic markets (i.e., country, state, county, city, watershed) in which each product was sold or used (including the corresponding dates);

j. For each year during the period of sale, state the quantities of the product that were applied or sold for application at particular locations; and

k. For each year during the period of sale, state the amount of revenue and profit you received from sales of the product.

RESPONSE: See responses to Interrogatory 5 above.

7. Have you purchased atrazine, atrazine-containing products, any atrazine related compound, and/or constituents of such products or compounds from other herbicide, pesticide, or other chemical manufacturers, distributors, producers, co-ops, or wholesalers? If so, state:

a. The name of the seller from whom you purchased the product, and their address and location;

b. The corresponding names of each product purchased;

c. The corresponding quantities of each product purchased;

d. The corresponding date that you purchased each product;

e. The chemical make-up/composition of the product you purchased; and

f. The name of the product that you manufactured, marketed, and/or sold as a result of your purchase.

RESPONSE: Syngenta states that it has acquired atrazine in the past from others as follows, which information it considers **Confidential and Subject to the Protective Order:**

Syngenta had VanDiest Supply Company in Webster City, IA, produce for it 420,000 gallons of Bicep II Mag Bulk in May, 2007.

Syngenta also had Omnium, LLC, in St. Joseph, MO, produce for it 157,302 gallons of

Aatrex 4L Bulk in May, 2009.

Syngenta purchased Atrazine Technical 500 kg from Oxon starting in 2008-2011 the following amounts:

2008—1292 tons
2009—2698 tons
2010—2014 tons
2011—1216 tons + 330 tons paid for but not yet delivered.

Additionally, Syngenta imported Atrazine Technical 500 kg from Changxing Zhongshan in China 3,999 tonnes or 5,616,000 kg from October 2008-March, 2009.

Further responding, Syngenta purchased Atrazine from Makhteshim Agan during the years 1993-1996 (approximately 12 million pounds) and from 1997-2000 (approximately 16 million pounds).

8. Identify all locations of which you are aware where atrazine is applied or has been applied, and identify and describe any and all documents of which you have knowledge that identify where atrazine is applied or has been applied.

RESPONSE: Information regarding this Interrogatory can be obtained for a fee from the GfK Kynetec service, (formerly Doane's AgroTrak), accessible at http://www.gfk.com/gfk-kynetec/). Further responding, Syngenta is making provisions to produce to plaintiffs all Doane/GfK data runs conducted at the request of by Gary Gries or Gene Hill it has in its possession that were conducted related to atrazine. Syngenta will produce any non-privileged, relevant, and responsive information or documents regarding where atrazine is applied or has been applied that have not already been produced in the instant case or in the Holiday Shores Sanitary District, et al. v. Syngenta Crop Protection, LLC, et al. litigation.

9. Identify and describe any and all correspondence, meetings, and/or communications with any farmer or pesticide applicator concerning atrazine in the States of Illinois, Indiana, Iowa, Kansas, Missouri, and Ohio or within the watershed of any body of water located in whole or in part in the States of Illinois, Indiana, Iowa, Kansas, Missouri, and Ohio, including, but not limited to, the date of such correspondence, meeting, and/or communication, the identity of each such farmer or pesticide applicator, and the substance of the correspondence, meeting, and/or communication.

RESPONSE: Syngenta objects to this Interrogatory on the grounds that use of the phrase "any farmer" is overbroad, burdensome, oppressive and harassing. Syngenta further states that over the years there have been many past and present employees from the Marketing, Customer Relations, Regulatory and Media Relations departments that have inter-acted with farmers and pesticide applicators in the States of Illinois, Indiana, Iowa, Kansas, Missouri, and Ohio regarding atrazine. Further answering, Syngenta states that it has produced or will produce Best Management Practice (BMP) brochures, stewardship and educational materials, watershed plans and drinking water and ecological management plan information.

Also, as Plaintiffs know, each CWS has access to its own atrazine residue levels through the Water Monitoring Center (WMC) web-driven database, with each CWS having its own confidential user name and password. To the extent that any CWS personnel utilizing that database are farmers or restricted use pesticide applicators themselves, there may have been communications/questions/data submissions made and which are available through that website.

Further responding, Syngenta states that it continues to be engaged in certain, ongoing watershed plans, and drinking water and ecological monitoring and watershed management plans.

10. Identify and describe any and all alternatives to and/or competitors of atrazine and atrazine-containing products, and all herbicides or other products that may be used instead of atrazine in areas where the use of atrazine is not allowed or is not desired. For each such herbicide or product, identify:

a. When it was first developed;

b. Who developed it;

c. Who manufactured and distributed it;

d. The trade names by which it is/was sold;

e. The markets in which it is used;

f. Why it is used in those markets;

g. The date on which the product was first sold;

h. The quantities of the product sold by year;

i. All health effects posed by exposure to this product;

j. The documents relating to those health effects;

k. The person(s), group(s), and/or company who first approved of or made the decision to start making or producing the product.

RESPONSE: There is no complete single alternative and/or competitor to Atrazine. Some corn herbicides/sorghum herbicides were developed to target broadleaf weed control; others treat both broadleaf weeds and grasses; some operate mainly as grass control products; and still others are non-selective unless genetically modified. Additionally, certain products do not have the crop selectivity of Atrazine and for which there are no genetically modified crops for which they are marketed. Thus, registered herbicides other than Atrazine which per their label could be used on corn/sorghum in Illinois are generally either less efficacious, have less application flexibility, are not as compatible to mix with atrazine or other products, are less cost effective or pose greater crop injury risks. Over time new herbicides have entered the marketplace but as yet none are true Atrazine replacements. In fact, as new herbicide active ingredients and new technologies like herbicide-tolerant corn cultivars are introduced, Atrazine continues to be relied upon for use with other herbicides, including mesotrione. Atrazine is registered as a pre-mix with more than 40 other herbicide products. Further responding, Syngenta states as follows:

a. Syngenta assumes that "developed" means when there is a brand of the active ingredient available for sale. This would be at the EPA approval date. Where the active ingredient preceded EPA approval, Syngenta's best estimate is given. Plaintiff can utilize the NPIRS system to search and obtain information in addition to that provided herein.

b. The requested information would be on the first label for the active ingredient and would also appear on a brand label. Many of these companies are no longer in existence.

c. The NPRIS system can be used to determine which entities manufactured/distributed any atrazine-containing products.

d. The NPIRS system can be used to determine the trade names by which atrazine-containing products are or were sold.

e. The requested information is available through publicly available product labels; however, Syngenta has previously produced to Plaintiff in the instant case or in the Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710, litigation certain labels and will produce additional labels to the extent it has any in the course of its rolling production of documents. Syngenta will submit and Exhibit which describes changes in various atrazine-containing product labels.

f. Products are used in various crop markets on the crops for which they are registered, in the manner they are registered, and because they are labeled for control of grasses or weeds on each specific label.

g. The exact first selling date is not possible to determine at this point in time, but would occur shortly after EPA acceptance and the next application season following registration of that

specific use pattern.

h. As for quantities sold, see the two (2) **exhibits** previously produced in Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710 regarding Mesotrione and S-Metolachlor 2006-2009 sales. Further responding, see response to Interrogatory 5.e. above.

i.-j. The risk assessments and reference doses of any registered active ingredient, including atrazine, can be reviewed via the EPA public docket and web sites (discussed more fully below), the SAP White Papers and Minutes, the Cumulative Risk Assessment performed by the USEPA in 2006, the product labels and the Material Safety Data Sheets for each product which have heretofore been produced in the state case of Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710 or which are available on the web site www.syngentacropprotection.com/labels/.

Syngenta states that there are voluminous materials on the USEPA web site which are responsive to this Request. Generally, EPA has atrazine specific information, or links to atrazine or related information, at the following sites:

1. The USEPA has the following web site: http://www.epa.gov/oppsrrd1/reregistration/atrazine/. This is what may be termed the general USEPA Atrazine web page. It lists all of the Docket Information, including various docket information relating to the:

- USEPA's Review of Atrazine;
- EPA's Special Review Process for Atrazine;
- Atrazine Reregistration Risk Assessments; and the
- FIFRA SAP materials associated with the 2003 Atrazine Reregistration and the 2009 Atrazine Evaluation, including the SAP separate Docket ID numbers for all of the SAP Hearings.

This web site also lists in detail and links to (which are described more fully below):

- Atrazine Updates (as of April 28, 2011) through March, 2011;
- Decision Documents related to Atrazine; and
- Various Federal Notices related to Atrazine.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

2. The USEPA also has the following web site: http://www.epa.gov/oppsrrd1/reregistration/atrazine/atrazine_update.htm. This site contains information related to atrazine re-registration and atrazine updates, including:

- The Atrazine Evaluation Process;
- Triazine Cumulative Risk Assessment;
- Atrazine Post-IRED Results, including the OPP's Monitoring in Community Water Systems, Ecological Watershed Monitoring Program, Cancer and Amphibians.

- This page also has search boxes on the right hand side of the screen re Atrazine SAP Meetings and Atrazine Evaluation.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

3. The USEPA also has the following web site: http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OPP-2003-0367. This site contains information related to the Atrazine "Docket Folder Summary," or what is commonly called the Atrazine Public Docket. The USEPA Docket ID Number is EPA-HQ-OPP-2003-0367. The home page of that Folder Summary is entitled: "Atrazine: Notice of Availability of Revised Atrazine Interim Reregistration Eligibility Decision (IRED)." Contained within that web site (as of April 28, 2011) are 209 items in the Docket Folder. These items include:

- 137 Public Submissions;
- 71 items of Supporting and Related Material; and
- 1 Notice.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

4. Additionally, the USEPA has the following web site: http://www.epa.gov/pesticides/chemical/foia/cleared-reviews/reviews/080803/080803.htm. This site contains it Freedom of Information Act (FOIA) page for Atrazine, and the Index of Cleared Science Reviews for Atrazine (PC Code 080803). Adobe Reader is needed to view many of the files on this page. As of April 28, 2011, this page contained links to and/or pdf's of various scientific reviews ranging in date from at least 1964-2006. These are among the thousands of studies that USEPA has considered regarding Atrazine.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

5. For comprehensive data sets, USEPA has multiple sites which are all listed on the following link: http://www.epa.gov/pesticides/science/models_db.htm#databases. Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through these web sites or any of its links. These are among the approximately 6,000 studies that USEPA has considered regarding Atrazine. In particular, Syngenta advises Plaintiffs that if they access the web site http://www.epa.gov/pesticides/science/models_db.htm#databases, a search window appears. The USEPA Science and Policy page appears which lists models and databases. If Plaintiffs type in (search for) atrazine, as of April 28, 2011, 614 results appear all related to the Science and Policy collection. Syngenta intends to rely upon, reference or utilize any or all references, sources or content set forth therein. In addition, a box appears in the upper right hand portion of that aforesaid page entitled: "Related Searches." If Plaintiffs click in that search box on "risks atrazine," 5,450 results regarding atrazine are listed in all areas of the USEPA web site. Syngenta also intends to rely upon, reference or utilize any or all data, materials, documents, references,

sources or content set forth therein. These are among the thousands of studies that USEPA has considered regarding Atrazine.

Syngenta addresses below the active ingredients identified in this Interrogatory so that Plaintiffs can search the EPA docket for the requested information. Plaintiffs can obtain labels and MSDSs for the active ingredients identified herein at the web site www.synentacropprotection.com/labels/ with the understanding that many of these active ingredients/products are not sold by Syngenta. Syngenta continues to make a rolling production of documents and various responsive documents have been or will be produced.

k. Syngenta knows of no single person who was responsible for the decision to make or sell any of the products referenced herein.

Further responding to Interrogatory 10, see the below product-specific responses covering the 2009 time frame which was previously provided in the Holiday Shores Sanitary District, et al. v. Syngenta Crop Protection, LLC f/n/a Syngenta Crop Protection, Inc., Case No. 04-L-000710, which were designated as **Confidential and Subject to the Protective Order** entered in that case.

Atrazine was developed for broad spectrum weed control during the 1950s and registered for use in corn in 1958 by J.R. Geigy, Ltd. According to a survey conducted by GfK kynetec (formerly DMRKYNETEC) a total of thirty-six (36) herbicides were used on corn acres in Illinois in 2009. These herbicides were developed either as primary broadleaf weed herbicides, both broadleaf and grass herbicides, primary grass weed herbicides, or non selective herbicides unless corn is genetically modified to be tolerant.

These herbicides vary in their modes of action for inhibiting weed growth and have a wide range of weed control attributes. No single herbicide developed for weed control in corn has the combination of the following weed management characteristic attributed to atrazine: these include broad spectrum broadleaf weed control in addition to some grass weed control; excellent crop tolerance with no corn injury; soil residual weed control, both pre-emergence (before corn emerges from the soil) and post-emergence applications; easily mixes with other herbicides; provides consistent weed control across a wide range of soil moisture and geographic conditions; application timing flexibility; and has registered uses that include field corn, sweet corn, popcorn and sorghum. In 2009 atrazine was used on 67.5 % of corn acres in Illinois (GfK Kynetec).

The following broadleaf or broadleaf and grass herbicides were used on more than 4% of the Illinois corn acres in 2009 and a brief description of some of the differences when compared to atrazine follows:

2,4-D only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control; is primarily used post-emergence and has less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2, 4 D spray drift occurs. Syngenta believes 2,4-D was developed in 1942 by AmChem. (7.4 % Illinois corn acres)

Clopryalid only controls broadleaf weeds and does not control grass weeds. It has a post-emergence use only and can cause injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical Company and registered in 1997 for use in corn. (4.5% Illinois corn acres)

Dicamba only controls broadleaf weed and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol. (5% Illinois corn acres)

Flumetsulam can only be used pre-emergence and has no post emergence applications. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993. (4.5 % of Illinois corn acres)

Mesotrione has less soil residual weed control activity in certain soils and controls fewer grass weeds than atrazine. Mesotrione was first registered for use in corn in 2001 by Syngenta Crop Protection, Inc. Mesotrione was used on 18.1% of Illinois corn acres in 2009 and 90% of those acres also received atrazine.

Simazine has pre-emergence use only and cannot be used post-emergence in corn. Simazine has less consistency than atrazine under low moisture conditions. Simazine was registered in 1957 by J.R. Geigy Ltd. (6.4% Illinois corn acres).

Isoxaflutole cannot be used post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicidal activity is less consistent than atrazine's under low soil moisture conditions. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical. (6.2% Illinois corn acres)

Of the herbicides developed primarily for grass weed control, only acetochlor, dimethenemide and s-metolachlor were used on more than 4% of the Illinois acres in 2009. These herbicides are almost always used in combination with broadleaf herbicides for broad spectrum weed control and they are not used for post-emergence control of weeds. Acetochlor was developed in 1980 by Monsanto and registered for use in corn in 1994 and was used on 30.4% of the Illinois corn acres in 2009; Dimethenamid was developed in 1988 by Sandoz and registered on corn in 1993 and was used on 4.9% of corn acres; and S-metolachlor was developed by Novartis registered in 1997 and used on 21% of the corn acres.

Of the herbicides developed for non-selective weed control unless corn is genetically modified, Glyphosate is the only product used on more than 4% of the acres. When compared to atrazine, Glyphosate can only be used on corn that is genetically modified and otherwise will cause severe corn injury. Glyphosate has no soil residual weed control activity. Glyphosate was developed in 1971 by Monsanto and registered for use on genetically modified corn in approximately 1998. Glyphosate was used on 74.4% of Illinois corn acres in 2009.

Three recently registered herbicides in corn were topramezone developed by BASF Corporation and registered in 2005 (1% Illinois corn acres), tembotrione developed by Bayer CropScience and registered in 2007 (1.4% corn acres) and saflufenacil developed by BASF Corporation and registered in 2009. When compared to atrazine, topramezone and tembotrione are only used post-emergence and have little to no soil residual weed control. Saflufenacil cannot be used after corn emergence and is less consistent than atrazine under low moisture conditions.

Certain herbicides developed or being developed for weed control in corn have not been registered for use in the United States. Terbuthylazine was developed by J.R.Geigy Ltd. as a broadleaf weed herbicide in the 1960s and was registered for use on corn in Germany in 1983. When compared to atrazine, Terbuthylazine's weed control is less consistent under low moisture conditions. A broadleaf weed control herbicide for corn (SYN449280) has been under development by Syngenta. The registration data package for this product is currently under development. This herbicide has a higher risk to injure soybeans the following year than atrazine and will have rotational restrictions due to injury on soybeans unless the soybeans have been certified for rotational tolerance.

Further responding, see the following product-specific responses which cover the 2010 time frame which are designated by Syngenta to be **Confidential and Subject to the Protective Order** entered in the instant case.

2010 use of all corn herbicide active ingredients for the state of Illinois..

The products addressed by Syngenta below are grouped into spectrum classes: "broadleaf," "grass," "broadleaf and grasses," and "non-selective for broadleaves and grasses." In 2010, there were **35 unique actives** used in IL corn.

Broadleaf Herbicide Grouping for Illinois (IL) in 2010

Atrazine treated 74.0% of the planted acres. Flexible applications allows for preplant, preemergence and postemergence for control of many broadleaves and certain grass species. Atrazine has excellent corn selectivity. It is commonly used in combination or sequentially with other registered products. Atrazine fits well with all tillage systems and also with herbicide tolerant crops to Glufosinate and glyphosate.

Mesotrione treated 20.0% of the planted acres. Of these acres, 81% also received atrazine. It has limited grass activity versus atrazine and does not provide commercial control of several broadleaf species including cocklebur, kochia, morninglories, and giant ragweed. Common waterhemp has developed resistance to mesotrione. Syngenta developed mesotrione and it was labeled for use on corn in 2001.

2,4-D treated 7.6% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control, is primarily used post-emergence, and has less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2,4-D drift occurs. Syngenta believes 2,4-D was developed in

1942 by AmChem.

Dicamba treated 4.5% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol.

None of the other "broadleaf" products treated more than 4% of the planted acres. Limited market penetration is due to a variety of limitations, some of which are listed below for each of these products.

Clopyralid treated 3.3% of the planted acres. It only controls certain broadleaf weeds and does not control grass weeds. It has post-emergence use only and can cause corn injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical company and registered in 1997 for use in corn.

Flumetsulam treated 3.3% of the planted acres. It can be used preemergence or postemergence. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993.

Diflufenzopyr treated 3.1% of the planted acres. Developed in 1999 by BASF. It is not applied alone but is mixed exclusively with dicamba for more consistent postemergence broadleaf control.

Simazine treated 2.8% of the planted acres. Simazine has preemergence use only and cannot be used postemergence in corn. Its weed control spectrum includes some broadleaf and grass weeds. Its performance is less consistent than atrazine, especially under low moisture conditions. Simazine was registered in 1957 by J.R. Geigy Ltd.

Tembotrione treated 1.8% of the planted acres. Bayer Crop Science received registration in 2007 for postemergence control of broadleaf weeds. It is used postemergence for some grass and broadleaf weed control and is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Saflufenacil treated 1.8% of the planted acres. BASF Corporation received registration in 2009 for burndown control of broadleaf weeds, preplant surface and preemergence applications before corn emergence. It provides short residual control of several broadleaf species and needs atrazine for control of many.

Thifensulfuron treated 1.6% of the planted acres. Developed by DuPont in the mid-1990s for postemergence burndown and preemergence and postemergence broadleaf weed control of a limited spectrum. It is usually used in combination with rimsulfuron to increase its weed control spectrum.

Prosulfuron was applied on 0.3% of the planted acres. Developed in 1995 by Syngenta for postemergence broadleaf weed control. It has the potential to carryover to rotational crops such as soybeans that limit the use.

Flumiclorac was applied on 0.1% of planted acres. Valent USA corporation received registration in 1994 for postemergence control of a limited broadleaf spectrum. The product has no grass activity or residual weed control.

Foramsulfuron was applied on 0.04% of planted acres. Bayer Crop Science received registration in 2002 for postemergence of grass and a limited broadleaf weed species. It has potential for crop injury and drift to non-target sites. It has no residual activity.

Halosulfuron was applied on 0.01% of planted acres. Developed in 1994 by Monsanto for postemergence control of limited broadleaf spectrum and nutsedge.

Broadleaf and Grass Herbicides for IL in 2010

Isoxaflutole treated 5.6% of the planted acres. It can be used preplant, preemergence or early post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicide activity is less consistent that atrazine's under low soil moisture conditions. It is not registered in certain states. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical.

Thiencarbazone treated 3.2% of planted acres. Bayer Crop Science registered the product in 2008 for preemergence or postemergence application. It provides control of a limited spectrum of certain grass and broadleaf weeds. It is not sold as an alone product.

Rimsulfuron treated 2.7% of the planted acres. Developed by DuPont for postemergence broadleaf and grass control.

Topramezone treated 1.2% of the planted acres. AmVac Chemical Corporation received registration in 2005 for postemergence control of broadleaf and some grass weeds. It is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Flumioxazin was applied on 0.4% of planted acres. Valent USA Corporation received registration in 2001 for postemergence burndown of broadleaf and grass weeds in minimum or no-till corn. Planting must be delayed 14-30 days after application.

Imazethapyr + Imazapyr was applied on 0.1% of planted acres. Products are used together for postemergence grass and broadleaf control in IMI tolerant corn, which limits its use. There are rotational limitations and weed resistance concerns.

Grass Products (some may have minor broadleaf activity) for IL in 2010.

Since the following products do not control a weed spectrum similar to atrazine, registration details and product characteristics have not been provided. The percent of IL planted acres treated by each have been included to show their relative importance in corn.

Acetochlor on 29.7% of planted acres.

S-metolachlor on 25.8% of planted acres.

Dimethenamid on 5.7% of planted acres.

Metolachlor on 3.4% of planted acres.

Dimethenamid-P on 2.6% of planted acres.

Nicosulfuron on 1.4% of planted acres.

Fluthiacet on 0.6% of planted acres.

Primisulfuron on 0.5% of planted acres.

Flufenacet on 0.4% of planted acres.

Alachlor on 0.2% of planted acres.

Non-selective herbicides for grasses and broadleaves for IL in 2010. These products control grasses and broadleaf weeds, but have no residual activity.

Glyphosate treated 76.5% (combined genetically modified use and burndown use) in conventional corn planted acres. Most of the use is postemergence to broadleaf and grass weeds and corn that is genetically modified to be tolerant glyphosate, otherwise it will cause severe corn injury. Only emerged weeds are controlled. Glyphosate has no soil residual activity. It is commonly used with atrazine for residual control. It was developed in 1971 by Monsanto for use in GMO corn in approximately 1998. There are twelve economically important problem weeds that have developed glyphosate resistant biotypes in the US.

Glufosinate was applied on 2.1% of planted acres for burndown of grass and broadleaf weeds prior to planting or corn emergence. Its spectrum is not as broad as and consistency is less than glyphosate.

Paraquat was applied on 0.4% of planted acres for contact burndown of grass and broadleaf weeds before corn emergence. There is no in-crop use. It has no residual preemergence activity. Syngenta believes Paraquat was registered for use on corn by ICI in ~1974.

2010 use of all corn herbicide active ingredients for the state of Indiana (IN).

The products addressed below are grouped them into spectrum classes: "broadleaf," "grass," "broadleaf and grasses," and "non-selective for broadleaves and grasses." In 2010 there were **34 unique actives** used in IN corn.

Broadleaf Herbicide Grouping for IN in 2010

Atrazine treated 64.3% of the planted acres. Flexible applications allows for preplant, preemergence and postemergence for control of many broadleaves and certain grass species. Atrazine has excellent corn selectivity. It is commonly used in combination or sequentially with other registered products. Atrazine fits well with all tillage systems and also with herbicide tolerant crops to gufosinate and glyphosate.

Mesotrione treated 30.1% of the planted acres. Of these acres, 93% also received atrazine. It has limited grass activity versus atrazine and does not provide commercial control of several broadleaf species including cocklebur, kochia, morningglories, and giant ragweed. Common waterhemp has developed resistance to mesotrione. Syngenta developed mesotrione and it was labeled for use on corn in 2001.

2,4-D treated 11.7% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control, is primarily used post-emergence, and has less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2,4-D drift occurs. Syngenta believes 2,4-D was developed in 1942 by AmChem.

Flumetsulam treated 10.0% of the planted acres. It can be used preemergence or postemergence. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993.

Clopyralid treated 9.8% of the planted acres. It only controls certain broadleaf weeds and does not control grass weeds. It has post-emergence use only and can cause corn injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical company and registered in 1997 for use in corn.

Simazine treated 6.6% of the planted acres. Simazine has preemergence use only and cannot be used postemergence in corn. Its weed control spectrum includes some broadleaf and grass weeds. Its performance is less consistent than atrazine, especially under low moisture conditions. Simazine was registered in 1957 by J.R. Geigy Ltd.

None of the other "broadleaf" products treated more than 4% of the planted acres. Limited market penetration is due to a variety of limitation, some of which are listed below for each of these products.

Dicamba treated 2.5% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol.

Tembotrione treated 1.7% of the planted acres. Bayer Crop Science received registration in 2007 for postemergence control of broadleaf weeds. It is used postemergence for some grass and broadleaf weed control and is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Saflufenacil treated 1.5% of the planted acres. BASF Corporation received registration in 2009 for burndown control of broadleaf weeds preplant surface and preemergence applications before corn emergence. It provides short residual control of several broadleaf species and needs atrazine for control of many.

Diflufenzopyr treated 1.3% of the planted acres. Developed in 1999 by BASF. It is not applied alone but is mixed exclusively with dicamba for more consistent postemergence broadleaf control.

Bromoxynil treated 1.0% of planted acres. It is used as a postemergence application for broadleaf control. It has no residual broadleaf nor does it provide grass control. Syngenta believes bromoxynil was developed by (May & Baker) Rhone Poulenc in the mid 1960s.

Prosulfuron was applied on 0.6% of the planted acres. Developed in 1995 by Syngenta for postemergence broadleaf weed control. It has the potential to carryover to rotational crops such as soybeans that limit the use.

Thifensulfuron was applied on 0.3% of the planted acres. Developed by DuPont in the mid-1990s for postemergence burndown and preemergence and postemergence broadleaf weed control of a limited spectrum. It is usually used in combination with rimsulfuron to increase its weed control spectrum.

Foramsulfuron was applied on 0.2% of planted acres. Bayer Crop Science received registration in 2002 for postemergence of grass and a limited broadleaf weed species. It has potential for crop injury and drift to non-target sites. It has no residual activity.

Broadleaf and Grass Herbicides for IN in 2010

Isoxaflutole treated 8.4% of the planted acres. It can be used preplant, preemergence or early post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicide activity is less consistent that atrazine's under low soil moisture conditions. It is not registered in certain states. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical.

Thiencarbazone treated 4.1% of planted acres. Bayer Crop Science registered the product in 2008 for preemergence or postemergence application. It provides control of a limited spectrum of certain grass and broadleaf weeds. It is not sold as an alone product.

Rimsulfuron treated 3.0% of the planted acres. Developed by DuPont for postemergence broadleaf and grass control.

Topramezone was applied on 0.6% of the planted acres. AmVac Chemical Corporation received registration in 2005 for postemergence control of broadleaf and some grass weeds. It is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Imazethapyr was applied on 0.4% + Imazapyr on 0.3% of planted acres. Products are usually used together for postemergence grass and broadleaf control in imidazolinone (IMI) tolerant corn, which limits its use. There are rotational limitations and weed resistance concerns.

Grass Products (some may have minor broadleaf activity) for IN in 2010

Since the following products do not control a weed spectrum similar to atrazine, registration details and product characteristics have not been provided. The percent of IN planted acres treated by each have been included to show their relative importance in corn.

S-metolachlor on 34.9% of planted acres.

Acetochlor on 26.5% of planted acres.

Nicosulfuron on 2.0% of planted acres.

Dimethenamid-P on 1.8% of planted acres.

Dimethenamid on 0.8% of planted acres.

Metolachlor on 0.8% of planted acres.

Pendimethalin on 0.8% of planted acres.

Primisulfuron on 0.8% of planted acres.

Flufenacet on 0.8% of planted acres.

Alachlor on 0.1% of planted acres.

Non-selective herbicides for grasses and broadleaves for IN in 2010. These products control grasses and broadleaf weeds, but have no residual activity.

Glyphosate treated 63.8% combined GMO use and burndown in conventional corn planted acres. Most of the use is postemergence to broadleaf and grass weeds and corn that is genetically modified to be tolerant glyphosate, otherwise it will cause severe corn injury. Only emerged weeds are controlled. Glyphosate has no soil residual activity. It is commonly used with atrazine for residual control. It was developed in 1971 by Monsanto for use in GMO corn in approximately 1998. There are twelve economically important problem weeds that have developed glyphosate resistant biotypes in the US.

Paraquat treated 2.4% of planted acres is used for contact burndown of grass and broadleaf weeds before corn emergence. There is no in-crop use. It has no residual preemergence activity. Syngenta believes Paraquat was registered for use on corn by ICI in ~1974.

Glufosinate on 2.0% of planted acres is used for burndown of grass and broadleaf weeds prior to planting or corn emergence. Its spectrum is not as broad as and consistency is less than glyphosate.

Iodosulfuron on 1.1% of planted acres. It is used for fall postemergence burndown of broadleaves. It also provides residual control. Syngenta believes Bayer Crop Science developed iodosulfuron and received registration in 2006.

2010 use of all corn herbicide active ingredients for the state of Iowa (IA)

The products addressed below are grouped them into spectrum classes: "broadleaf," "grass," "broadleaf and grasses," and "non-selective for broadleaves and grasses." In 2010 there were **32 unique actives** used in IA corn.

Broadleaf Herbicide Grouping for IA in 2010

Atrazine treated 49.2% of the planted acres. Flexible applications allows for preplant, preemergence and postemergence for control of many broadleaves and certain grass species. Atrazine has excellent corn selectivity. It is commonly used in combination or sequentially with other registered products. Atrazine fits well with all tillage systems and also with herbicide tolerant crops to gufosinate and glyphosate.

Mesotrione treated 23.3% of the planted acres. Of these acres, 53% also received atrazine. It has limited grass activity versus atrazine and does not provide commercial control of several broadleaf species including cocklebur, kochia, morninglories, and giant ragweed. Common waterhemp has developed resistance to mesotrione. Syngenta developed mesotrione and it was labeled for use on corn in 2001.

Clopyralid treated 6.7% of the planted acres. It only controls certain broadleaf weeds and

does not control grass weeds. It has post-emergence use only and can cause corn injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical company and registered in 1997 for use in corn.

Flumetsulam treated 6.7% of the planted acres. It can be used preemergence or postemergence. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993.

2,4-D treated 5.2% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control, is primarily used post-emergence, and has less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2,4-D drift occurs. Syngenta believes 2,4-D was developed in 1942 by AmChem.

None of the other "broadleaf" products treated more than 4% of the planted acres. Limited market penetration is due to a variety of limitation, some of which are listed below for each of these products.

Dicamba treated 3.9% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol.

Tembotrione treated 2.6% of the planted acres. Bayer Crop Science received registration in 2007 for postemergence control of broadleaf weeds. It is used postemergence for some grass and broadleaf weed control and is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Diflufenzopyr treated 2.3% of the planted acres. Developed in 1999 by BASF. It is not applied alone but is mixed exclusively with dicamba for more consistent postemergence broadleaf control.

Thifensulfuron treated 1.4% of the planted acres. Developed by DuPont in the mid-1990s for postemergence burndown and preemergence and postemergence broadleaf weed control of a limited spectrum. It is usually used in combination with rimsulfuron to increase its weed control spectrum.

Halosulfuron was applied on 0.3% of planted acres. Developed in 1994 by Monsanto for postemergence control of limited broadleaf spectrum and nutsedge.

Saflufenacil was applied on 0.5% of the planted acres. BASF Corporation received registration in 2009 for burndown control of broadleaf weeds preplant surface and preemergence applications before corn emergence. It provides short residual control of several broadleaf species and needs atrazine for control of many.

Bromoxynil was applied on 0.05% of planted acres. It is used as a postemergence application for broadleaf control. It has no residual broadleaf nor does it provide grass control. Syngenta believes bromoxynil was developed by (May & Baker) Rhone Poulenc in the mid 1960s.

Flumiclorac was applied on 0.04% of planted acres. Valent USA corporation received registration in 1994 for postemergence control of a limited broadleaf spectrum. The product has no grass activity or residual weed control.

Broadleaf and Grass Herbicides for IA in 2010

Isoxaflutole treated 12.4% of the planted acres. It can be used preplant, preemergence or early post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicide activity is less consistent that atrazine's under low soil moisture conditions. It is not registered in certain states. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical.

Thiencarbazone treated 5.2% of planted acres. Bayer Crop Science registered the product in 2008 for preemergence or postemergence application. It provides control of a limited spectrum of certain grass and broadleaf weeds. It is not sold as an alone product.

Rimsulfuron treated 4.9% of the planted acres. Developed by DuPont for postemergence broadleaf and grass control.

Topramezone treated 2.7% of the planted acres. AmVac Chemical Corporation received registration in 2005 for postemergence control of broadleaf and some grass weeds. It is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Imazethapyr was applied on 0.04% of planted acres. Products are used together for postemergence grass and broadleaf control in IMI tolerant corn, which limits its use. There are rotational limitations and weed resistance concerns.

Grass Products (some may have minor broadleaf activity) for IA in 2010.

Since the following products do not control a weed spectrum similar to atrazine, registration details and product characteristics have not been provided. The percent of IL planted acres treated by each have been included to show their relative importance in corn.

Acetochlor on 37.4% of planted acres.

S-metolachlor on 13.6% of planted acres.

Dimethenamid on 3.5% of planted acres.

Dimethenamid-P on 2.7% of planted acres.

Nicosulfuron on 2.4% of planted acres.

Fluthiacet on 0.9% of planted acres.

Pendimethalin on 0.8% of planted acres.

Metolachlor on 0.6% of planted acres.

Alachlor on 0.3% of planted acres.

Flufenacet on 0.2% of planted acres.

Primisulfuron on 0.1% of planted acres.

Non-selective herbicides for grasses and broadleaves for IA in 2010. These products control grasses and broadleaf weeds, but have no residual activity.

Glyphosate treated 74.9% combined GMO use and burndown in conventional corn planted acres. Most of the use is postemergence to broadleaf and grass weeds and corn that is genetically modified to be tolerant glyphosate, otherwise it will cause severe corn injury. Only emerged weeds are controlled. Glyphosate has no soil residual activity. It is commonly used with atrazine for residual control. It was developed in 1971 by Monsanto for use in GMO corn in approximately 1998. There are twelve economically important problem weeds that have developed glyphosate resistant biotypes in the US.

Glufosinate treated 6.1% of planted acres for burndown of grass and broadleaf weeds prior to planting or corn emergence. Its spectrum is not as broad as and consistency is less than glyphosate.

Paraquat was applied on 0.2% of planted acres for contact burndown of grass and broadleaf weeds before corn emergence. There is no in-crop use. It has no residual preemergence activity. Syngenta believes Paraquat was registered for use on corn by ICI in ~1974.

2010 use of all corn herbicide active ingredients for the state of Kansas (KS).

The products addressed below are grouped them into spectrum classes: "broadleaf," "grass," "broadleaf and grasses," and "non-selective for broadleaves and grasses." In 2010 there were **30 unique actives** used in KS corn.

Broadleaf Herbicide Grouping for KS in 2010

Atrazine treated 72.6% of the planted acres. Flexible applications allows for preplant, preemergence and postemergence for control of many broadleaves and certain grass species. Atrazine has excellent corn selectivity. It is commonly used in combination or sequentially with other registered products. Atrazine fits well with all tillage systems and also with herbicide tolerant crops to gufosinate and glyphosate.

Mesotrione treated 18.9% of the planted acres. Of these acres, 98% also received atrazine. It has limited grass activity versus atrazine and does not provide commercial control of several broadleaf species including cocklebur, kochia, morningglories, and giant ragweed. Common waterhemp has developed resistance to mesotrione. Syngenta developed mesotrione and it was labeled for use on corn in 2001.

2,4-D treated 17.9% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control, is primarily used post-emergence, and has less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2,4-D drift occurs. Syngenta believes 2,4-D was developed in 1942 by AmChem.

Dicamba treated 10.5% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol.

Clopyralid treated 9.7% of the planted acres. It only controls certain broadleaf weeds and does not control grass weeds. It has post-emergence use only and can cause corn injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical company and registered in 1997 for use in corn.

Flumetsulam treated 9.7% of the planted acres. It can be used preemergence or postemergence. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993.

None of the other "broadleaf" products treated more than 4% of the planted acres. Limited market penetration is due to a variety of limitation, some of which are listed below for each of these products.

Diflufenzopyr treated 3.3% of the planted acres. Developed in 1999 by BASF. It is not applied alone but is mixed exclusively with dicamba for more consistent postemergence broadleaf control.

Tembotrione treated 1.9% of the planted acres. Bayer Crop Science received registration in 2007 for postemergence control of broadleaf weeds. It is used postemergence for some grass and broadleaf weed control and is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Thifensulfuron treated 1.0% of the planted acres. Developed by DuPont in the mid-1990s for postemergence burndown and preemergence and postemergence broadleaf weed control of a limited spectrum. It is usually used in combination with rimsulfuron to increase its weed control spectrum.

Saflufenacil was applied on 0.6% of the planted acres. BASF Corporation received registration in 2009 for burndown control of broadleaf weeds preplant surface and preemergence applications before corn emergence. It provides short residual control of several broadleaf species and needs atrazine for control of many.

Flumiclorac was applied on 0.4% of planted acres. Valent USA corporation received registration in 1994 for postemergence control of a limited broadleaf spectrum. The product has no grass activity or residual weed control.

Prosulfuron was applied on 0.3% of the planted acres. Developed in 1995 by Syngenta for postemergence broadleaf weed control. It has the potential to carryover to rotational crops such as soybeans that limit the use.

Broadleaf and Grass Herbicides For KS in 2010

Isoxaflutole treated 15.0% of the planted acres. It can be used preplant, preemergence or early post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicide activity is less consistent that atrazine's under low soil moisture conditions. It is not registered in certain states. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical.

Rimsulfuron treated 1.9% of the planted acres. Developed by DuPont for postemergence broadleaf and grass control.

Thiencarbazone was applied on 0.5% of planted acres. Bayer Crop Science registered the product in 2008 for preemergence or postemergence application. It provides control of a limited spectrum of certain grass and broadleaf weeds. It is not sold as an alone product.

Carfentrazone-ethyl was applied on 0.2% of planted acres. Syngenta believes Valor was developed by Valent and registered in 2008 for fall burndown of broadleaf and grass weeds with residual control in corn. If spring applied, application must be 14-30 days before corn is planted.

Topramezone was applied on 0.1% of the planted acres. AmVac Chemical Corporation received registration in 2005 for postemergence control of broadleaf and some grass weeds. It is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Grass Products (some may have minor broadleaf activity) for KS in 2010.

Since the following products do not control a weed spectrum similar to atrazine, registration details and product characteristics have not been provided. The percent of KS planted acres treated by each have been included to show their relative importance in corn.

Acetochlor on 25.4% of planted acres.

S-metolachlor on 22.4% of planted acres.

Alachlor on 6.9% of planted acres.

Dimethenamid on 2.9% of planted acres.

Metolachlor on 1.9% of planted acres.

Dimethenamid-P on 1.9% of planted acres.

Fluthiacet on 0.2% of planted acres.

Primisulfuron on 0.2% of planted acres.

Flufenacet on 0.2% of planted acres.

Non-selective herbicides for grasses and broadleaves for KS in 2010. These products control grasses and broadleaf weeds, but have no residual activity.

Glyphosate treated 87.9% combined GMO use and burndown in conventional corn planted acres. Most of the use is postemergence to broadleaf and grass weeds and corn that is genetically modified to be tolerant glyphosate, otherwise it will cause severe corn injury. Only emerged weeds are controlled. Glyphosate has no soil residual activity. It is commonly used with atrazine for residual control. It was developed in 1971 by Monsanto for use in GMO corn in approximately 1998. There are twelve economically important problem weeds that have developed glyphosate resistant biotypes in the US.

Glufosinate was applied on 0.7% of planted acres for burndown of grass and broadleaf weeds prior to planting or corn emergence. Its spectrum is not as broad as and consistency is less than glyphosate.

Paraquat was applied on 0.4% of planted acres for contact burndown of grass and

broadleaf weeds before corn emergence. There is no in-crop use. It has no residual preemergence activity. Syngenta believes Paraquat was registered for use on corn by ICI in ~1974.

Iodosulfuron was applied on 0.4% of planted acres. It is used for fall postemergence burndown of broadleaves. It also provides residual control. Syngenta believes Bayer Crop Science developed iodosulfuron and received registration in 2006.

2010 use of all corn herbicide active ingredients for the state of Missouri (MO).

The products addressed below are grouped them into spectrum classes: "broadleaf," "grass," "broadleaf and grasses," and "non-selective for broadleaves and grasses." In 2010 there were **32 unique actives** used in MO corn.

Broadleaf Herbicide Grouping for MO in 2010

Atrazine treated 74.4% of the planted acres. Flexible applications allows for preplant, preemergence and postemergence for control of many broadleaves and certain grass species. Atrazine has excellent corn selectivity. It is commonly used in combination or sequentially with other registered products. Atrazine fits well with all tillage systems and also with herbicide tolerant crops to gufosinate and glyphosate.

Mesotrione treated 20.8% of the planted acres. Of these acres, 64% also received atrazine. It has limited grass activity versus atrazine and does not provide commercial control of several broadleaf species including cocklebur, kochia, morningglories, and giant ragweed. Common waterhemp has developed resistance to mesotrione. Syngenta developed mesotrione and it was labeled for use on corn in 2001.

2,4-D treated 10.1% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control, is primarily used post-emergence, and has less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2,4-D drift occurs. Syngenta believes 2,4-D was developed in 1942 by AmChem.

Thifensulfuron treated 6.3% of the planted acres. Developed by DuPont in the mid-1990s for postemergence burndown and preemergence and postemergence broadleaf weed control of a limited spectrum. It is usually used in combination with rimsulfuron to increase its weed control spectrum.

None of the other "broadleaf" products treated more than 4% of the planted acres. Limited market penetration is due to a variety of limitation, some of which are listed below for each of these products.

Flumetsulam treated 2.7% of the planted acres. It can be used preemergence or

postemergence. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993.

Clopyralid treated 2.7% of the planted acres. It only controls certain broadleaf weeds and does not control grass weeds. It has post-emergence use only and can cause corn injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical company and registered in 1997 for use in corn.

Tembotrione treated 2.0% of the planted acres. Bayer Crop Science received registration in 2007 for postemergence control of broadleaf weeds. It is used postemergence for some grass and broadleaf weed control and is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Dicamba treated 1.7% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol.

Prosulfuron treated 1.3% of the planted acres. Developed in 1995 by Syngenta for postemergence broadleaf weed control. It has the potential to carryover to rotational crops such as soybeans that limit the use.

Flumiclorac treated 1.3% of planted acres. Valent USA corporation received registration in 1994 for postemergence control of a limited broadleaf spectrum. The product has no grass activity or residual weed control.

Simazine treated 1.0% of the planted acres. Simazine has preemergence use only and cannot be used postemergence in corn. Its weed control spectrum includes some broadleaf and grass weeds. Its performance is less consistent than atrazine, especially under low moisture conditions. Simazine was registered in 1957 by J.R. Geigy Ltd.

Saflufenacil treated 1.0% of the planted acres. BASF Corporation received registration in 2009 for burndown control of broadleaf weeds preplant surface and preemergence applications before corn emergence. It provides short residual control of several broadleaf species and needs atrazine for control of many.

Diflufenzopyr was applied on 0.7% of the planted acres. Developed in 1999 by BASF. It is not applied alone but is mixed exclusively with dicamba for more consistent postemergence broadleaf control.

Halosulfuron was applied on 0.3% of planted acres. Developed in 1994 by Monsanto for postemergence control of limited broadleaf spectrum and nutsedge.

Broadleaf and Grass Herbicides for MO in 2010

Rimsulfuron treated 8.7% of the planted acres. Developed by DuPont for postemergence broadleaf and grass control.

Isoxaflutole treated 3.4% of the planted acres. It can be used preplant, preemergence or early post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicide activity is less consistent that atrazine's under low soil moisture conditions. It is not registered in certain states. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical.

Thiencarbazone treated 2.4% of planted acres. Bayer Crop Science registered the product in 2008 for preemergence or postemergence application. It provides control of a limited spectrum of certain grass and broadleaf weeds. It is not sold as an alone product.

Topramezone was applied on 0.8% of the planted acres. AmVac Chemical Corporation received registration in 2005 for postemergence control of broadleaf and some grass weeds. It is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Flumioxazin was applied on 0.8% of planted acres. Valent USA Corporation received registration in 2001 for postemergence burndown of broadleaf and grass weeds in minimum or no-till corn. Planting must be delayed 14-30 days after application.

Imazethapyr + Imazapyr was applied on 0.6% of planted acres. Products are used together for postemergence grass and broadleaf control in IMI tolerant corn, which limits its use. There are rotational limitations and weed resistance concerns.

Grass Products (some may have minor broadleaf activity) for MO in 2010.

Since the following products do not control a weed spectrum similar to atrazine, registration details and product characteristics have not been provided. The percent of MO planted acres treated by each have been included to show their relative importance in corn.

S-metolachlor on 24.7% of planted acres.

Acetochlor on 22.4% of planted acres.

Dimethenamid on 7.3% of planted acres.

Metolachlor on 2.4% of planted acres.

Dimethenamid-P on 1.5% of planted acres.

Nicosulfuron on 1.5% of planted acres.

Primisulfuron on 1.3% of planted acres.

Pendimethalin on 1.2% of planted acres

Alachlor on 0.4% of planted acres.

Non-selective herbicides for grasses and broadleaves for MO in 2010. These products control grasses and broadleaf weeds, but have no residual activity.

Glyphosate treated 58.9% combined GMO use and burndown in conventional corn planted acres. Most of the use is postemergence to broadleaf and grass weeds and corn that is genetically modified to be tolerant glyphosate, otherwise it will cause severe corn injury. Only emerged weeds are controlled. Glyphosate has no soil residual activity. It is commonly used with atrazine for residual control. It was developed in 1971 by Monsanto for use in GMO corn in approximately 1998. There are twelve economically important problem weeds that have developed glyphosate resistant biotypes in the US.

Glufosinate treated 3.8% of planted acres for burndown of grass and broadleaf weeds prior to planting or corn emergence. Its spectrum is not as broad as and consistency is less than glyphosate.

2010 use of all corn herbicide active ingredients for the state of Ohio (OH)

The products addressed below are grouped them into spectrum classes: "broadleaf," "grass," "broadleaf and grasses," and "non-selective for broadleaves and grasses." In 2010 there were **33 unique actives** used in OH corn.

Broadleaf Herbicide Grouping for OH in 2010

Atrazine treated 75.5% of the planted acres. Flexible applications allows for preplant, preemergence and postemergence for control of many broadleaves and certain grass species. Atrazine has excellent corn selectivity. It is commonly used in combination or sequentially with other registered products. Atrazine fits well with all tillage systems and also with herbicide tolerant crops to gufosinate and glyphosate.

Mesotrione treated 17.7% of the planted acres. Of these acres, 99% also received atrazine. It has limited grass activity versus atrazine and does not provide commercial control of several broadleaf species including cocklebur, kochia, morninglories, and giant ragweed. Common waterhemp has developed resistance to mesotrione. Syngenta developed mesotrione and it was labeled for use on corn in 2001.

2,4-D treated 12.2% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has no soil residual weed control, is primarily used post-emergence, and has

less application timing flexibility when compared to atrazine. There is also a risk for injury to broadleaf crops adjacent to corn if 2,4-D drift occurs. Syngenta believes 2,4-D was developed in 1942 by AmChem.

Simazine treated 6.5% of the planted acres. Simazine has preemergence use only and cannot be used postemergence in corn. Its weed control spectrum includes some broadleaf and grass weeds. Its performance is less consistent than atrazine, especially under low moisture conditions. Simazine was registered in 1957 by J.R. Geigy Ltd.

Flumetsulam treated 4.1% of the planted acres. It can be used preemergence or postemergence. It has the potential for corn injury on certain soil types and certain environmental conditions. Syngenta believes that Flumetsulam was developed in 1990 by DowElanco and registered for use in corn in 1993.

None of the other "broadleaf" products treated more than 4% of the planted acres. Limited market penetration is due to a variety of limitation, some of which are listed below for each of these products.

Dicamba treated 3.8% of the planted acres. It only controls broadleaf weeds and does not control grass weeds; has limited soil residual weed control; and is primarily used post-emergence. Dicamba can cause injury to corn especially on certain soils and can cause injury to broadleaf crops adjacent to corn if spray drift occurs. Syngenta believes Dicamba was developed in 1965 by Velsicol.

Clopyralid treated 3.5% of the planted acres. It only controls certain broadleaf weeds and does not control grass weeds. It has post-emergence use only and can cause corn injury to certain corn inbreds. Syngenta believes Clopryalid was developed in 1975 by DOW Chemical company and registered in 1997 for use in corn.

Thifensulfuron treated 2.9% of the planted acres. Developed by DuPont in the mid-1990s for postemergence burndown and preemergence and postemergence broadleaf weed control of a limited spectrum. It is usually used in combination with rimsulfuron to increase its weed control spectrum.

Diflufenzopyr treated 1.9% of the planted acres. Developed in 1999 by BASF. It is not applied alone but is mixed exclusively with dicamba for more consistent postemergence broadleaf control.

Tembotrione treated 1.9% of the planted acres. Bayer Crop Science received registration in 2007 for postemergence control of broadleaf weeds. It is used postemergence for some grass and broadleaf weed control and is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Bromoxynil was applied on 0.8% of planted acres. It is used as a postemergence application for broadleaf control. It has no residual broadleaf nor does it provide grass control. Syngenta believes bromoxynil was developed by (May & Baker) Rhone Poulenc in the mid

1960s.

Metribuzin was applied on 0.7% of planted acres. Syngenta believes Bayer Crop Science developed metribuzin around 1968. It can be used preemergence or postemergence with limited soil residual characteristics for broadleaf weed control. There is limited grass activity. There is a potential for corn injury under certain conditions.

Saflufenacil was applied on 0.4% of the planted acres. BASF Corporation received registration in 2009 for burndown control of broadleaf weeds preplant surface and preemergence applications before corn emergence. It provides short residual control of several broadleaf species and needs atrazine for control of many.

Bentazone was applied on 0.1% of planted acres. It is used postemergence for broadleaf control without residual soil activity. Syngenta believes it was developed by BASF around 1968.

Foramsulfuron was applied on 0.5% of planted acres. Bayer Crop Science received registration in 2002 for postemergence of grass and a limited broadleaf weed species. It has potential for crop injury and drift to non-target sites. It has no residual activity.

Broadleaf and Grass Herbicides for OH in 2010

Isoxaflutole treated 11.3% of the planted acres. It can be used preplant, preemergence or early post emergence and can cause injury to corn under certain environmental conditions. Isoxaflutole's herbicide activity is less consistent that atrazine's under low soil moisture conditions. It is not registered in certain states. Syngenta believes Isoxaflutole was registered in 1998 by Bayer Chemical.

Rimsulfuron treated 5.1% of the planted acres. Developed by DuPont for postemergence broadleaf and grass control.

Thiencarbazone treated 4.7% of planted acres. Bayer Crop Science registered the product in 2008 for preemergence or postemergence application. It provides control of a limited spectrum of certain grass and broadleaf weeds. It is not sold as an alone product.

Topramezone was applied on 0.4% of the planted acres. AmVac Chemical Corporation received registration in 2005 for postemergence control of broadleaf and some grass weeds. It is commonly used with atrazine to increase the speed of control, weed spectrum and consistency of control.

Grass Products (some may have minor broadleaf activity) for OH in 2010.

Since the following products do not control a weed spectrum similar to atrazine, registration details and product characteristics have not been provided. The percent of IL planted acres treated by each have been included to show their relative importance in corn.

S-metolachlor on 24.7% of planted acres.

Acetochlor on 23.9% of planted acres.

Dimethenamid on 5.9% of planted acres.

Pendimethalin on 4.1% of planted acres

Metolachlor on 3.2% of planted acres.

Flufenacet on 1.6% of planted acres.

Nicosulfuron on 0.9% of planted acres.

Dimethenamid-P on 0.4% of planted acres.

Alachlor on 0.1% of planted acres.

Primisulfuron on 0.02% of planted acres.

Non-selective herbicides for grasses and broadleaves for OH in 2010. These products control grasses and broadleaf weeds, but have no residual activity.

Glyphosate treated 49.9% combined GMO use and burndown in conventional corn planted acres. Most of the use is postemergence to broadleaf and grass weeds and corn that is genetically modified to be tolerant glyphosate, otherwise it will cause severe corn injury. Only emerged weeds are controlled. Glyphosate has no soil residual activity. It is commonly used with atrazine for residual control. It was developed in 1971 by Monsanto for use in GMO corn in approximately 1998. There are twelve economically important problem weeds that have developed glyphosate resistant biotypes in the US.

Glufosinate treated 2.9% of planted acres for burndown of grass and broadleaf weeds prior to planting or corn emergence. Its spectrum is not as broad as and consistency is less than glyphosate.

Paraquat was applied on 0.2% of planted acres for contact burndown of grass and broadleaf weeds before corn emergence. There is no in-crop use. It has no residual preemergence activity. Syngenta believes Paraquat was registered for use on corn by ICI in ~1974.

Iodosulfuron was applied on 0.2% of planted acres. It is used for fall postemergence burndown of broadleaves. It also provides residual control. Syngenta believes Bayer Crop Science developed iodosulfuron and received registration in 2006.

11. Identify and describe any and all efforts by Syngenta or others selling, applying, or using Syngenta's atrazine or atrazine-containing products to limit the amount of atrazine in public drinking water supplies, including, but not limited to, lowered maximum application rates, greater setbacks, Best Management Practices, or the use of alternative products within threatened watersheds.

RESPONSE: With respect to Syngenta's efforts, it has engaged in label education and extensive watershed research, planning and related work; see response to Interrogatory 18 below. Further responding, as to alternative products, see response to Interrogatory 10 above. With respect to lowered maximum application rates and setback, see the labels (and changes therein) for atrazine and atrazine-containing products previously produced, to be produced or available at www.syngentacropprotection.com/labels/. Syngenta would have to speculate regarding the efforts of unrelated entities.

12. Identify and describe each degradate of atrazine, and for each degradate identify:

a. When it was first identified;

b. Who first identified it;

c. Any and all studies, monitoring, and/or research related to each degradate, including the name of the study, the researchers involved in each study, and the findings of each study;

d. Any and all studies, monitoring, and/or research related to each degradate conducted by Syngenta and/or directly or indirectly funded by Syngenta, in whole or in part, including the name of the study, the researchers involved in each study, the amount that Syngenta funded for each study, and the findings of each study; and

e. All health risks posed by exposure to each degradate, and identify all documents relating to such risks.

RESPONSE: With respect Degradates as defined by plaintiffs involved in the reactions which occur during the production of atrazine, see the Confidential Statements of Formula and Manufacturing and By-Product documents previously produced or to be produced, all of which are designated as **Confidential and Subject to the Protective Order** in this case.

With respect to Degradates as defined by plaintiffs that are alleged breakdown products of atrazine in the environment or when atrazine comes into contact with water, the degradates

are:

- deethylatrazine (a/k/a DEA);
- deisopropylatrazine (a/k/a DIA);
- diaminochlorotriazine (a/k/a DACT);
- ammeline;
- ammelide;
- cyanuric acid;
- hydroxyatrazine;
- Hydroxydeethylatrazine; and
- Hydroxydeisopropylatrazine.

Syngenta states that several of the chemicals listed by Plaintiffs are not "commonly found in water supplies" as suggested by Plaintiffs. Moreover, although n-nitrosoatrazine is defined as a degradate by Plaintiffs, Syngenta states that n-nitrosoatrazine is not a true breakdown product of atrazine.

With respect to sub-paragraphs c., d., and e., to the extent Syngenta has any studies that relate to or refer to degradates of atrazine, said documents have been or will be produced to Plaintiffs. In particular, Syngenta refers plaintiffs to its Atrazine Review, prepared for the WO-FAO JMPR Committee: Final Report, Report Number T011389-06.

13. Identify and describe each and every atrazine related compound found in Syngenta's atrazine and in each atrazine-containing product manufactured, sold, or distributed by Syngenta and for each atrazine related compound, identify:

a. The amount of each atrazine related compound found in each atrazine-containing product;

b. The method by which the amount of each atrazine related compound is measured;

c. Any and all studies, monitoring, and/or research related to each atrazine related compound, including the name of the study, the researchers involved in each study, and the findings of each study;

d. Any and all studies, monitoring, and/or research related to each atrazine related compound conducted by Syngenta and/or directly or indirectly funded by Syngenta, in whole or in part, including the name of the study, the researchers involved in each study, and the findings of each study; and

e. All health risks posed by exposure to each atrazine related compound, and identify all documents relating to such risks.

RESPONSE: See responses to Interrogatories 5, 10 and 12 above.

14. Identify and describe each and every degradant of each atrazine related compound identified in Interrogatory No. 12.

RESPONSE: See responses to Interrogatories 5, 10, 11, 12 and 13 above. Also see the Confidential Statements of Formula and Manufacturing and By-Product documents previously produced or to be produced, all of which are designated as **Confidential and Subject to the Protective Order** in this case.

15. State the date on which you first had reason to believe that any water supply had been infiltrated by atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites and for each additional instance on which you received any information that gave you reason to believe that any water supply had been infiltrated by atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites:

a. State the date on which you received the information;

b. Describe the information you received;

c. Identify the officer or employee who first received the information and each officer and employee to whom the information was subsequently communicated;

d. State what actions, if any, you took in response to the information.

RESPONSE: Initially, Syngenta refers Plaintiff to The Triazine Herbicides--50 Years Revolutionizing Agriculture, Elsevier, B.V. Press (1st ed. 2008), particularly chapters 29 and 30 and the references included in those chapters; Residue Reviews, Volume 32, "The Triazine Herbicides 1970," and the references cited therein, including but not limited to pp. 198 and 200; Triazine Herbicides Risk Assessment, American Chemical Society Symposium Series 683 published in 1998, and Giddings, J.M., Anderson, T.A., Hall, Jr., L.W., Hosmer, A.J., Kendall, R.J., Richards, R.P., Solomon, K.R., Williams, W.M., Atrazine in North American Surface Waters: A Probabilistic Aquatic Ecological Risk Assessment, SEATAC Press (2005), for more historical information and information which may be considered responsive to this Interrogatory.

Further answering, see responses to Interrogatories 29 and 33 below. Despite the ambiguity of the phrases/terms "reason to believe" and "infiltrated," and given the various interpretations of such phrases/terms, in addition to the foregoing, Syngenta refers Plaintiff to its previous and ongoing production of community water system monitoring programs, watershed management plans and its ecological watershed plans, the previously disclosed work and reports of the Eco-Risk Atrazine Ecological Risk Assessment Panels, and its March, 1995, Chapter 20,

Product Stewardship submission to the USEPA, Bates page numbers SYN00858808-SYN00861007. Syngenta has produced and will continue to produce non-privileged and relevant documents which are responsive to this Interrogatory. Further responding, Syngenta also provides the following examples of early information regarding the potential presence of atrazine in water resources:

Technical Reports

1. A Review of Historical Surface Water Monitoring for Atrazine in Iowa, 1975-1993 Technical Report 2-94.

2. A Review of Historical Surface Water Monitoring for Atrazine in Eleven States in the Central United States (1975-1991) July 1992 Technical Report: 11-92.

3. Investigation of Atrazine in Hoover Reservoir Columbus, Ohio, November 1991 (Blasland & Bouck Engineers, P.C.).

4. Historical Surface Water Monitoring for Atrazine in the Mississippi River near Baton Rouge - St. Gabriel, Louisiana, Technical Report: 1-92.

5. Investigation of Atrazine in Hoover Reservoir Columbus, Ohio, Volume II - Water Quality Model; January 1992 (Blasland & Bouck Engineers, P.C.).

6. Herbicides in Drinking Water Sources: A Treatment Technology Overview, Technical Report: 2-92.

7. A Review of Surface-Water Monitoring for Atrazine in the Chesapeake Bay Watershed (1976 – 1991) July 1992 Technical Report: 3-92.

8. Atrazine and Drinking Water Sources: A Preliminary Exposure Assessment for Iowa, Technical Report: 1-94.

9. Atrazine and Drinking Water Sources: A Preliminary Exposure Assessment for Illinois, Technical Report 3-93.

10. Atrazine and Drinking Water Sources: An Exposure Assessment for Populations using the Greater Mississippi River System, Technical Report: 2-93.

Further responding, see studies listed in response to Request No. 5 filed contemporaneously herewith.

16. Describe any other litigation or administrative proceeding that you are or have been involved in related to atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites, including but not limited to the name, caption, date, and all documents

relating to the proceeding, the identity of all persons employed or hired by you who have provided testimony (by deposition, hearing, affidavit, trial, or other sworn manner) in each respective matter, an explanation of the allegations, subject matter, and basis for the proceeding, and the identity of any copies of depositions, statements, or other documents related to the proceedings.

RESPONSE: Syngenta states that litigation proceedings which may be responsive to this Interrogatory include:

a. Kevin Lemaire and Ned Wilson v. Ciba-Geigy Corporation, et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 31,854. Filed 5/14/85.

b. John Stewart and Elizabeth Ann Stewart v. Leon Hebert, Novartis Crop Protection, et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 54,214. Removed to the USDC, Middle District of Louisiana, Case Number 00-814.

c. John Stewart and Elizabeth Ann Stewart v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company, et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,719, filed 8/29/02. Removed to the USDC, Middle District of Louisiana, Case Number 02-cv-884.

d. John Stewart and Elizabeth Ann Stewart v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company, et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,810, filed 9/18/02.

e. Ryland John Brignol and Patricia Thrower Brignol v. Leon Hebert, Novartis Crop Protection, Inc., et al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 54,210. Removed to the USDC, Middle District of Louisiana, Case Number 00-815.

f. Ryland John Brignol and Patricia Thrower Brignol v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,717, filed 8/29/02, Removed to USDC, Middle District of Louisiana, Case Number 02-883.

g. Ryland John Brignol and Patricia Thrower Brignol v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,807, filed 9/18/02.

h. Edwin Webb Miller and April Suzanne Miller v. Leon Hebert, Novartis Crop Protection, et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case

Number 54,209. Removed to the USDC, Middle District of Louisiana, Case Number 2000-813.

i. Edwin Webb Miller and April Suzanne Miller v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company, et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,809, filed 9/18/02.

j. Edwin Webb Miller and April Suzanne Miller v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company , et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,716. Removed to the USDC, Middle District of Louisiana, Case Number 02-886.

k. Henry Davis and Juanita Davis v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company , et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,718, filed 8/29/02. Removed to the USDC, Middle District of Louisiana, Case Number 02-885.

l. Henry Davis and Juanita Davis v. Leon Hebert, Ernie Henkel, Ervin Granier, Martin Fontenot, Bobby Joe Kiper, and XYZ Insurance Company , et. al., 18th Judicial District Court for the Parish of Iberville, State of Louisiana, Case Number 57,808, filed 9/18/02.

m. Henry Davis v. Leon Hebert, Dr. Elizabeth Delzell, Martin Fontenot, Robert Vignes, Don Calfee, Don Law, William F. Snyder, Ernie Henkel, Doug Campbell, and Novartis Crop Protection, et. al., Case Number 54,213. Removed to the USDC, Middle District of Louisiana, Case Number 00-812.

n. Bryson Adams et. al. v. Environmental Purification Corporation, et. al., USDC for the Western District of Louisiana, Case Number 99-1998. Filed 11/1/99. Note: Atrazine was not the focus of this lawsuit, but in the course of the litigation Ciba disclosed to the plaintiffs that atrazine was present at some amount at the site. Atrazine is not named in the Complaint or in any of the Amended Complaints.

o. Carlton Gene Rinehart, et. al. v. Ciba-Geigy et. al., USDC for the Middle District of Louisiana, Case Number 96-517. Note: Atrazine was not the focus of this lawsuit, but in the course of the litigation Ciba disclosed to the plaintiffs that atrazine was present at some amount at the site. Atrazine is not named in the Complaint or in any of the Amended Complaints.

p. Reuben Moss, et. al. v. W. R. Grace, et. al., Civil District Court for the Parish of Orleans, State of Louisiana, Case Number 95-2143. Filed 2/15/95

q. Daniel McKenzie, et. al. v. Ciba-Geigy, et. al., 18th Judicial Court for the Parish of Iberville, State of Louisiana, case Number 43,586. Filed 9/3/93

r. Freddie Lee Barnes, et. al. v. Novartis Crop Protection, et. al., In the Circuit Court of Mobile County, Alabama. Case Number CV-00-4045.

s. Charles L. Robinson, et. al. v. Novartis Crop Protection, et. al., In the Circuit Court of Mobile County, Alabama. Case Number CV-01-527.

t. Norman Turner v. Chevron, Ciba-Geigy, Drexel, Rhone-Poulac, and Zeneca. In the Superior Court of the County of Los Angeles, California. Case Number BC256293.

u. Carmita Marks v. Barnard's Soil Service, Inc., et al. In the Circuit Court of Wayne County, Illinois. Case Number 94-L-7.

v. Beverly Dorman v. Ciba-Geigy Corp., et al. In the Circuit Court of Washington County, Alabama. Case No. CV-04-038C. Note: Plaintiff claimed in Responses to Interrogatories that atrazine was one of the chemicals which allegedly caused her injury.

To the extent that any documents responsive to this Interrogatory are governed by or are subject to a protective or confidentiality order or agreement, then Syngenta cannot produce the same outside the limits thereof.

Syngenta states that it has been involved in the following arbitrations, all of which were **Confidential Proceedings under** applicable Federal Insecticide, Fungicide and Rodenticide Act ("FIFRA") or American Arbitration Association ("AAA") rules, regulations, or procedures regarding confidentiality, and all of which information is sealed and **subject to various Protective Orders and Arbitration Confidentiality Agreements**:

i. In the matter of the Arbitration between Syngenta Crop Protection, Inc., Claimant and Oxon Italia, S.P.A. and Sipcam Agro USA, Inc., Respondents. Docket No. AAA 16 171 00180 05.

ii. In the matter of the Arbitration between Syngenta Crop Protection, Inc., Claimant and Drexel Chemical Company, Respondent. Docket No. AAA 16 171 Y 00386 07.

iii. In the matter of the Arbitration between Ciba-Geigy Ltd., Claimant and Drexel Chemical Company, Respondent. Docket No. AAA 16 171 00321 92G.

iv. In the matter of the Arbitration between Syngenta Crop Protection, Inc., Claimant Agan Chemical Manufacturers, Ltd. and Makhteshim Agan of North America, Inc., Respondents, Docket No. AAA 16 171 Y 00132 06.

Syngenta further states that it has been involved in the following Scientific Advisory Panel (SAP) meetings or that the following other proceedings dealt with Atrazine:

DATE	**TOPIC**
9/14-17/2010	Re-Evaluation of the Human Health Effects of Atrazine: Review of Non-Cancer Effects and Drinking Water Frequency
4/26-29/2010	Re-Evaluation of the Human Health Effects of Atrazine: Review of Experimental Animal and *In Vitro* Studies and Drinking Water Monitoring Frequency

2/2-4/2010	Open Meeting to Consider and Review Draft Framework and Case Studies on Atrazine; Human Incidents and Agricultural Health Study: Incorporation of Epidemiology and Human Incident Data into Human Health Risk Assessment
11/3/2009	Presentation of the Approach to Reevaluate Atrazine
05/12-15/2009	The Ecological Significance of Atrazine Effects on Primary Producers in Surface Water Streams in the Corn and Sorghum Growing Region of the United States
12/04-07/2007	Interpretation of the Ecological Significance of Atrazine Stream-Water Concentrations Using a Statistically-Designed Monitoring Program
10/09-12/2007	The Potential for Atrazine to Affect Amphibian Gonadal Development
07/17, etc./2003	Characterization of Epidemiology Data Relating to Prostate Cancer and Exposure to Atrazine
06/17-20/2003	Potential Developmental Effects of Atrazine on Amphibians
06/27-29/2000	Issues Pertaining to Atrazine Cancer Risk Assessment
09/21-24/1999	Issues Related to Standard Operating Procedures for Residential Exposure Assessment, LifeLineTM Project, Carbamate Pesticide, Issues Pertaining to Hazard and Dose Response Assessment and Review of American Cyanamid Company's Probabilistic Assessment for Chlorfenapyr *(***Atrazine shown to be present in 18-year-old carpet in dust monitoring, also a study describing higher absorption in children than adults using atrazine as an example)*
05/25-27/1999	Office of Pesticide Programs Policy for the Use of the FQPA 10x Safety Factor; Statistical Methods for Use of Composite Data in Acute Dietary Exposure Assessment; Use of Watershed-derived Percent Crop Areas as Refinement Tool in FQPA Drinking Water Exposure Assessments for Tolerance Reassessment *(***Atrazine not addressed specifically, but used as an example)*
07/29-30/1998	Proposed Methods for Basin-scale Estimation of Pesticide Concentrations in Flowing Water and Reservoirs for Tolerance Reassessment; Linear Low Dose Extrapolation for Cancer Risk Decisions; DDVP Risk Issues; FQPA 10 Safety Factor Status Report; and Chlorothalonil: Mechanism for the Formation of Renal and Forestomach Tumors *(***Atrazine only mentioned in first session, used as an example water contaminant)*
12/10-11/1997	Estimating Drinking Water Exposure as a Component of the Dietary Risk Assessment; Spray Drift Program *(***Only the first session, on drinking water, mentioned atrazine)*
9/7/1988	Third Peer Review of Atrazine
7/88	Second Peer Review of Atrazine
9/87	Peer Review of Atrazine

Other Legal Proceedings Include (but are not limited to):

a. The following Federal Advisory Committee Act (FACA) litigation was filed in the federal district court for the District of Columbia:

NATURAL RESOURCES DEFENSE COUNCIL v. STEPHEN L. JOHNSON, et al.,	No. 1:05-cv-00340-PLF

b. There was Consent Decree litigation in which Syngenta intervened, filed in the federal court for the Northern District of California:

NATURAL RESOURCES DEFENSE COUNCIL, et al., Plaintiffs, v. *CHRISTINE TODD WHITMAN, et al.,* Defendants. *CROPLIFE AMERICA,* Intervenor-Defendant, or in the Alternative, Amicus.	No. C-99-3701 WHA

c. There was a FIFRA civil penalty proceeding, FIFRA-04-2007-9118(b), resolved by a Consent Agreement.

d. There was NRDC/Endangered Species Act litigation filed in the federal district court for the District of Maryland, as follows:

NATURAL RESOURCES DEFENSE COUNCIL, Plaintiffs, v. *UNITED STATES ENVIRONMENTAL PROTECTION AGENCY,* Defendant.	No. RDB03CV2444

SYNGENTA CROP PROTECTION, INC, Proposed Intervenor-Defendant.

e. Syngenta has also been involved in some way in certain other litigation matters involving the Endangered Species Act.

f. The following additional legal proceedings also occurred: Ciba-Geigy Corp. v. Environmental Protection Agency, Case No. 93-1758 (D.D.Cir. 1995) (Atrazine MCL litigation).

17. Describe any inquiries or complaints of which you are aware regarding the health effects of or the contamination of water resources or water supplies by atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites concerning the health effects of atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites; and/or concerning the contamination of water resources by atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites. For each such complaint, describe:

a. Who made the complaint/inquiry, and when they made it;

b. To whom the complaint/inquiry was directed;

c. The nature of each complaint/inquiry;

d. What your response was to the complaint/inquiry; and

e. Any resulting action taken by you as a result of the complaint/inquiry.

RESPONSE: This Interrogatory is so overbroad as to potentially cover almost any comment ever received by Syngenta about any topic involving atrazine. Further responding, Syngenta states that it receives inquiries in its Customer Care department regarding claims of issues such as lack of efficacy from a particular application, burn down, drift effects, etc. Previously unreported effects and other instances of claimed effects to people, animals, plants, property or the environment are reported to the EPA via FIFRA sec. 6(a)(2) reports, which are available via FOIA request from the EPA. Further responding, to the extent they are deemed responsive, see the litigation proceedings referred to in response to Interrogatory 16 above. Syngenta continues to collect and will produce to Plaintiffs non-privileged, relevant and responsive documents in its rolling production of documents.

18. Identify and describe any and all instructions, guidance, or suggestions made by you to anyone concerning the use of atrazine or atrazine-containing products, including, but not limited to, the timing of application, the Best Management Practices of use of atrazine or atrazine-containing products, and the likelihood of atrazine runoff.

RESPONSE: Syngenta has previously produced to Plaintiffs copies of certain labels and MSDSs, which are also available on the internet at www.syngentacropprotection.com/lables/. Further responding, Syngenta refers Plaintiff to the stewardship and Best Management Practices ("BMP") documents already produced by Syngenta in the Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710, litigation in response to plaintiff HSSD's First Requests for Production No. 17. Further responding, see responses to Interrogatories 19 and 29 below. Syngenta will produce to Plaintiffs any and all such labels and documents responsive to this Interrogatory in its possession which have not yet been produced.

19. Identify each and every statement made by you concerning atrazine, atrazine-containing products, any atrazine related compound, and/or constituents or degradates of such products or compounds, including, but not limited to, oral and written statements and/or written material that you have provided to or caused to be provided to the public, to a water provider, or to a governmental entity. For each such statement or material:

a. Identify the person or persons responsible for having drafted or issued the information, statement, or written material, and any other persons involved in or responsible for conveying the information;

b. State the date such information was first issued or distributed and the inclusive period during which it was used;

c. Identify all documents reflecting, referring, or relating to such information, statement, or written material; and

d. Identify each and every entity or individual to whom you issued or distributed such information, statement, or written material.

RESPONSE: Initially, it is not possible to identify "each and every statement made by [Syngenta] concerning atrazine." In addition, Syngenta continues its ongoing review and production of discoverable documents, and will produce all relevant, discoverable, responsive, non-privileged documents not yet produced. With those caveats, Syngenta states as follows:

EPA-Office of Water Drinking Water Guidance for Atrazine

In August 1988, the EPA-Office of Water (EPA-OW) published the existing Atrazine lifetime Health Advisory Level (HAL) of 3 ppb and the one (1) day (100 ppb-child), ten (10) day (100 ppb-child), and seven (7) year (50 ppb-child and 200 ppb-adult) shorter term HALs. Health Advisory Levels are developed with margins of safety. For atrazine, a 100-fold safety factor (SF) was used in the calculation of the one (1) and ten (10) day and seven (7) year exposure periods, while a 1000-fold SF was used for the lifetime (70 year) period.

In 1991, the EPA-OW established a Maximum Contaminant Level (MCL) of 3 ppb for Atrazine under the authority of the Safe Drinking Water Act (SDWA) in a January 30, 1991, CFR final rule. As defined by EPA-OW, the atrazine MCL and HALs are concentrations in drinking water at which adverse health effects would not be expected to occur from exposure for the specified length of time.

EPA – Office of Pesticide Programs (EPA-OPP) Drinking Water Guidance for Atrazine and its Chlorinated Metabolites

In January 2003 (atrazine IRED), the EPA-OPP published its table of drinking water levels of comparison (DWLOCs) for atrazine and its chlorinated metabolites. The DWLOC is defined as "the maximum concentration in drinking water that, when considered together with dietary (food) exposure, does not exceed a level of concern". The EPA-OPP calculated DWLOCs for all population subgroups as shown in the table below, and all of the finished water values below contain a 1000 fold safety factor:

	DWLOC (ppb)	
Population Subgroup	**Acute (One Day) Exposure**	**Intermediate (Seasonal) and Chronic (Annual) Exposure**
General Population	not available	68
Infants <1 year old	not available	12.5/37.5*
Children 1 to 6	not available	23
Children 7 to 12	not available	53
Females 13 to 50	298	60
Males 13 to 19	not available	68
Males 20 and over	not available	68
Seniors	not available	68

* Per the Memorandum of Agreement (2004), 37.5 ppb as a 90-day average in raw water at the CWS intake.

Communication of Atrazine Drinking Water Criteria

The EPA-OW drinking water atrazine HALs and MCL development process was provided in most, if not all, Ciba water quality presentations to state drinking water agencies, state departments of agriculture, federal agencies (USDA, EPA, USGS), university environmental and agricultural personnel, crop consultants, commodity groups (national and

state corn growers, sorghum growers and sugarcane growers), national and state Farm Bureau personnel, and Community Water System personnel. This information was provided to the above noted individuals and organizations from late 1988 through the present (2009) in local community (such as CWS personnel), county, state, and national regulatory or scientific meetings. Beginning in 2003, and continuing to the present, information regarding the EPA-OPP DWLOCs for atrazine and its chlorinated metabolites was provided in most, if not all, of the presentations for the meetings listed above.

The atrazine HALs and MCL information was included in several Ciba-Geigy technical reports starting in 1992 (Herbicides in Drinking Water Sources: Public Health Perspectives, Technical Report: 4-92, Ciba-Geigy Corporation, Agricultural Group). The atrazine related technical reports were published from 1992 through 1998. The technical reports were prepared to provide information on atrazine and other herbicides occurrence in surface water and the relationship to the Safe Drinking Water Act requirements for water utility monitoring and treatment compliance. The technical reports were directed and coordinated by Dennis Tierney, Ciba-Geigy, in conjunction with consultants.

Atrazine mixing, loading and application FIFRA Label Requirements to Increase Protection of Groundwater and Surface Water Quality Communication Process

The EPA-Office of Pesticide Programs (EPA-OPP), in consultation with Ciba-Geigy, revised the atrazine FIFRA use directions (label amendments) to increase protection of groundwater in 1990 and surface water in 1992(these were voluntary and initiated by Ciba). There was also a 1996 label change related to tile terrace risers. These changes were initially applied only to Ciba-Geigy atrazine containing products until such label changes became mandatory for other atrazine registrants. To advise dealers and growers of the label changes, educational materials were developed and provided to customers (dealerships and distributors) by sales personnel and to university agricultural research personnel. Presentations and meetings were also held with state FIFRA and drinking water regulatory agencies.

The EPA-OPP approved label changes were also described in articles in farmer/grower publications and through state Farm Bureau and commodity organizations meetings with their members. Educational material was also provided to farm radio stations. Handout booklets were prepared for distribution to the Ciba-Geigy agricultural customers and other interested private and public entities.

Also, as plaintiffs are well aware, Syngenta has made various statements regarding atrazine on its web sites www.atrazinefacts.com, www.syngenta.com (Plaintiffs can perform a search in the upper right hand corner of the Home Page and obtain 42 different hits related to atrazine), and www.syngentacropprotection.com (Plaintiffs can perform a search in the upper right hand corner of the Home Page and obtain 42 different hits related to atrazine; Plaintiffs can also click on the Herbicides page and search for an obtain multiple documents and information related to atrazine and atrazine-containing products; moreover, Plaintiffs can click on the Labels and MSDS page and search for such atrazine-related documents by Product, Crop Group or Product Type). See also the previously produced labels and MSDSs, and the stewardship and Best Management Practices ("BMP") documents previously produced.

Further responding, see Response to Interrogatory 15 above. Syngenta also refers plaintiffs to The Triazine Herbicides 50 Years Revolutionizing Agriculture, Elsevier, B.V. Press (1st ed. 2008); its statements found and positions taken in Ciba-Geigy Corp. v. Environmental Protection Agency, Case No. 93-1758 (D.D.Cir. 1995) (Atrazine MCL litigation); its submissions to the FAO/WHO Meeting on Pesticide Residues (JMPR) 2007; and Syngenta's Atrazine Review, Prepared for the WHO-FAO/JMPR Committee: Final Report, Report Number T011389-06.

20. Identify and describe any relationship that you have or have had with any laboratories or research groups related to studies of atrazine, atrazine-containing products, any atrazine related compound, and/or the constituents or degradates of such products or compounds. For each such laboratory or research group, please describe:

a. The name and address of the laboratory or group;

b. The nature of the relationship, contract, agreement, understanding, or work efforts existing between you and them, including what you specifically asked them to do, how much you paid them, and when;

c. Whether you have any ownership interest in the laboratory or group;

d. The studies that they performed for you, the results, and when you received the results;

e. What correspondence you had with him/them regarding services;

f. What governmental entity you reported the results to and when;

g. Other joint efforts, long-term contracts or relationships, exclusivity agreements, and/or other contracts that you have entered into with them.

RESPONSE: The production of certain of the requested information is protected from disclosure under FIFRA's Data Compensation provisions and the AAA arbitration rules related to confidentiality of the same. The studies submitted by or on behalf of Syngenta to the USEPA, which have been previously identified by name to Plaintiffs in the Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710, litigation, and in response to Request No. 5 filed contemporaneously herewith, disclose on the first few pages the laboratory/testing facility/research group/location involved in the study. Syngenta will work with Plaintiffs to make the studies available for review under the conditions set forth under FIFRA. Syngenta further states ADPEN Laboratories, Inc., 11757 Central Parkway, Jacksonville, FL 32224, maintains certain raw data and a repository of data, contracts,

correspondence, reports and documents related to all the monitoring analyses it has done for Syngenta and its predecessors over the years. Further responding, see the compilation of **exhibits** previously produced in the *Holiday Shores* litigation identifying various study protocols, invoices and related materials. In addition, see the detailed descriptions in response to Interrogatory 32 below of the multiple USEPA web sites and how to search them re additional documents and information responsive to this Interrogatory.

21. Identify all national and international factories, plants, or facilities where you manufacture or have manufactured atrazine, atrazine-containing products, and/or constituents of such products. For each facility:

a. Identify its name, location, and physical address;

b. Describe and list what products you manufacture(d) there by name, quantity, chemical composition/make-up, and year;

c. Describe and list to whom you sold the products from each facility, and the purchaser's physical address and location;

d. Identify when each facility first began manufacturing each product and when (if applicable) it ceased manufacturing each product.

RESPONSE: Syngenta manufactured Atrazine or Atrazine-containing products at its plants in McIntosh, Alabama; St. Gabriel, Louisiana; and Schweizerhalle near Basel, Switzerland. At some time Syngenta also had some small production facilities located in Mexico, Brazil and Argentina. Syngenta also had atrazine-containing products produced outside of St Gabriel, including two (2) separate occasions: 2007 at Van Diest for Bicep II Magnum and Spring, 2009 at Omnium for atrazine 4L.

22. Identify all of the regions, states, countries, watersheds, or other geographic areas where atrazine, atrazine-containing products, and/or the constituents of such products have been banned or restricted, or are no longer used because of concerns about water contamination or potential health effects. For each such area, identify:

a. The date that such banning or restriction was approved;

b. The date that such banning, restriction, or lack of use took effect;

c. The governmental body who approved the ban or restriction;

d. All of the reasons given by the governmental body for the ban or restriction; and

e. All studies or research considered by the governmental body related to the ban or restriction.

RESPONSE: Syngenta states that atrazine has never been discontinued in any country for health or safety reasons.

In further response, Syngenta refers Plaintiff to its product labels for information responsive to this Interrogatory, available at www.syngentacropprotection.com/labels/. The product labels have restrictions regarding areas where products cannot be used, such as based on soil type, etc. Atrazine products carry several statements to minimize the potential of atrazine entering water. These include statements for mixing/loading and applying. These are considered as label stewardship statements for all grower uses and not as a "geographic area of restricted use." Atrazine is considered a "Restricted Use Pesticide" due to ground and surface water related issues. The label carries the statements: "For retail sale to and use only by certified applicators or persons under their direct supervision, and only for those uses covered by the certified applicator's certification. This product is a restricted-use herbicide due to ground and surface water concerns. Users must read and follow all precautionary statements and instruction for use in order to minimize potential for atrazine to reach ground and surface water." This refers to rate limitations related to soil and soil types and does not refer to "geographic" areas. There are no geographical or crop growing regions that are restricted areas, nor any within the Memorandum of Agreement with USEPA.

Within the state of Wisconsin, there are isolated areas within specific counties known as "Prohibition Areas" where growers do not use atrazine based on a state enforcement standard of well detections >3ppb (parent plus metabolites). In addition there are rate limitations based on specific soil conditions. Growers are not allowed to use atrazine in those areas. There is a web site listing counties containing a prohibited area with a detailed county map showing the specific region number, section number, and street names, etc. These county areas are based on the soil conditions and do not reflect what percent of that area is actual acres in production of a crop that could be treated with atrazine. In the following web site, there is a value showing the acres covered by the Wisconsin prohibition, but it cannot be assumed that the "total" refers to crop acres that may use atrazine. The full information describing the process is contained in Chapter ATCP 30 Pesticide Product Restrictions pg. 139-147, of Agriculture, Trade & Consumer Protection (Register, April, 2009, No. 640) that is publicly available. The public web site is: http://datcp.wi.gov/Environment/Water_Quality/Atrazine/index.aspx, and a specific listing of counties with atrazine prohibition areas can be found at: http://datcp.wi.gov/Environment/Water_Quality/Atrazine/Atrazine_Prohibition_Areas/index.aspx. The maps can also be located through a Google search: "Wisconsin Atrazine Prohibition Area Maps WI Department of Agriculture" and click on the option: Atrazine Prohibition Areas – Wisconsin Department of Agriculture. This takes you to Atrazine Prohibition Area, which has a listing of counties. Click on any county and get a county map showing the shaded restricted zone.

In the state of Iowa there are no prohibition areas; there are use patterns and setback guidelines related to sinkholes which are set forth on the label; in addition there are certain geographical rate restrictions based on an Iowa rule. To the extent that such guidelines and limitations are considered responsive to this Interrogatory, Syngenta states that its labels over the years have added, deleted or modified various setbacks, instructions and guidelines for mixing, use and application, which labels have already been produced to Plaintiff in the *Holiday Shores* litigation, are available at www.syngentacropprotection.com/labels/, and a summary of which changes will also be produced.

23. In all regions, states, countries, or other areas where atrazine, atrazine-containing products, and/or constituents of such products have been banned, restricted, or are no longer used, describe the product that you are selling for use on the same crops that the banned, restricted, or no longer used product was intended for. For each such product:

a. State the name;

b. Indicate when it was developed, manufactured, marketed, supplied, and/or sold;

c. Identify the quantities you sold by year, and to whom;

d. Identify the geographic markets (i.e., country, state, county, city) in which it was sold (including the corresponding dates);

e. Identify what markets it was used in;

f. Identify the product for which it is intended to be used with, or mixed, blended or made into;

g. Identify the cost of producing it;

h. Identify the revenue and/or profit you have made on it;

i. Identify the person(s) or group(s) who first approved of or made the decision to start making, producing, or selling it.

RESPONSE: Syngenta objects to sub-parts g. and h. as the same seeks information which is irrelevant and immaterial to any issue in this case and is not reasonably calculated to lead to the discovery of admissible evidence at trial.

Subject to the foregoing objections, and without waiving the same, Syngenta states that within the large number of atrazine-containing product brands sold by many companies, there would be changes in use patterns as new brands are continually being registered and others

cancelled by the company, reflecting introduction of new mixing partners and company business decisions. Over the many years of atrazine use, there have been hundreds of atrazine containing brands and many companies selling those brands.

Further responding, see responses to Interrogatory 10 above.

24. For each year during which you have sold atrazine or atrazine-containing products, state the shares of the market, and any geographical subdivision thereof for which you can obtain this information through reasonable investigation, of Syngenta and each other participant in the market for such products.

RESPONSE: Syngenta objects to this Interrogatory on the grounds it seeks information which is irrelevant and immaterial to any issue in this case, seeks information which is not reasonably calculated to lead to the discovery of admissible evidence at trial, and is beyond the scope of permissible discovery. Further objecting, Syngenta states that market share liability does not exist in most of the states at issue in this case and the law in those states does not recognize market share, enterprise, or any other theory of collective liability.

Subject to the foregoing, and without waiving the same, Syngenta states that in any event, it does not maintain in the routine course of its business "market share" information in terms of sales of its atrazine and atrazine-containing products as compared to other registrants or suppliers on a state-by-state basis. To the extent that it is deemed responsive to this Interrogatory, Syngenta is making arrangements to produce to Plaintiffs all the Doane/GfK data runs re atrazine that were conducted by Gary Gries for or on behalf of or at the request of Gene Hill.

25. Identify any and all publications, databases, or services known to you which may be utilized to show the market share for the sale or distribution of atrazine for Syngenta and/or other manufacturers or sellers of atrazine.

RESPONSE: Syngenta objects to this Interrogatory on the grounds it seeks information which is irrelevant and immaterial to any issue in this case, seeks information which is not reasonably calculated to lead to the discovery of admissible evidence at trial, and is beyond the scope of permissible discovery. Further objecting, Syngenta states that market share liability does not exist in most of the states at issue in this case and the law in those states does not recognize market share, enterprise, or any other theory of collective liability.

Subject to the foregoing, and without waiving the same, Syngenta states that in any event, it does not maintain in the routine course of its business "market share" information in terms of sales of its atrazine and atrazine-containing products as compared to other registrants or suppliers on a state-by-state basis. To the extent that it is deemed responsive to this Interrogatory,

Syngenta is making arrangements to produce to Plaintiffs all the Doane/GfK data runs re atrazine that were conducted by Gary Gries for or on behalf of or at the request of Gene Hill.

26. Identify and describe any and all instructions, guidance, or suggestions made by you to anyone concerning the use of atrazine or atrazine-containing products, including, but not limited to, the timing of application, the Best Management Practices of use of atrazine or atrazine-containing products, and the likelihood of atrazine runoff.

RESPONSE: This Interrogatory is entirely duplicative of Interrogatory No. 18, and accordingly Syngenta's incorporates by reference its response to that Interrogatory as if fully set forth herein.

27. Identify each agricultural or farm association, cooperative, trade association and any other person, organization, or entity that has, on your behalf or in cooperation with you, advertised, endorsed, supported, or in any way promoted the use of atrazine, atrazine-containing products, and/or constituents. The detailed description should include, but is not limited to, the identity of what the person, organization, or entity was hired or contracted to do for you, if applicable; the identity of what the person or entity was asked to do when meetings or gatherings were attended that pertained in any way to the present litigation; the identity of what the person, organization, or entity was asked to say to the members, the media, or members of the public; the amount that the person, organization, or entity was paid, including any transfer of value from you; the identity of any correspondence between you and the person, organization, or entity; and the identity or any contracts or agreements between you and the person, organization, or entity.

RESPONSE: Syngenta objects to the extent that this Interrogatory seeks to violate and invade Syngenta's freedoms of speech, assembly, and association guaranteed by the First and Fourteenth Amendments, its freedom to petition for redress of grievances under the First Amendment, its rights to procedural and substantive due process under the Fourteenth Amendment, and its rights to equal protection of the law under the Fifth and Fourteenth Amendments, and the Illinois, Indiana, Iowa, Kansas, Missouri, and Ohio state constitutional equivalents thereof.

Subject to the foregoing, and without waiving the same, Syngenta states that as it interprets this Interrogatory, it does not include science-based or science-related entities, organizations or groups. Further answering, Syngenta states that it is a dues-paying member of the following national organizations and organizations within the six (6) states listed in Plaintiffs' Petition:

States

i. Illinois Fertilizer and Chemical Association;
ii. Chemical Industry Council of Illinois;
iii. Illinois Corn Growers Association;
iv. Illinois Council on Best Management Practices;
v. Mid-America Crop Life Association;
vi. OH Agribusiness Association
vii. OPARR - Ohio Professional Applicators for Responsible Regulation
viii. Indiana Agribusiness Association
ix. Indiana Environmental Alliance
x. Agribusiness Association of IA
xi. IA Trees Forever
xii. IA Alliance for Environmental Concerns
xiii. IA Biotechnology Association
xiv. Missouri Agri-Business Association
xv. Kansas Agri-Business Association

National

i. National Corn Grower Assn Ag Industry Council
ii. National Onion Assn
iii. Ag Retailers Assn
iv. American Seed Trade Assn
v. CropLife America
vi. Biotechnology Industry Organization
vii. American Soybean Assn Biotech Group
viii. National Aerial Applicator Assn
ix. National Assn of Wheat Growers Foundation
x. National Potato Council
xi. National Sorghum Producers
xii. Rice Foundation
xiii. US Grain Council - Two memberships - Seeds and CP
xiv. National Cotton Foundation
xv. Produce for Better Health
xvi. Conservation Technology Information Center
xvii. United Fresh Produce Assn
xviii. US Potato Board
xix. National Assn of Independent Crop Consultants
xx. Council of State Governments

Syngenta has no routine business records regarding the potential memberships of its employees in any such entities, but Syngenta understands that certain Syngenta employees may have personal memberships in different organizations.

Further responding, Syngenta states that the Triazine Network was formed in November, 1994, to secure a scientific based outcome of the EPA Special Review of the triazine herbicides, including Atrazine, and to serve as a liaison between growers, EPA, other branches of government and the triazine registrants; Syngenta is not a member of the Triazine Network.

28. Identify each and every agricultural or farm association, cooperative, trade association, trade organization, industry group, committee, and/or lobbying group that you have been a member of at any time relating to atrazine, atrazine-containing products, and/or constituents of such products. The description includes, but is not limited to, the identity of the aspects of atrazine, atrazine-containing products, or the constituents of such products that the group has addressed, the identity of the person employed or hired by you who was a member of or representative to the group; the inclusive dates of membership; and the amount of any transfer of money, funding, donation, or other value between you and the group and why such a transfer was made.

RESPONSE: See Syngenta's responses and objections to Interrogatory 27 above.

29. Describe in detail the steps you have taken to prevent atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites from contaminating water resources or water supplies, and specifying the time period in which such steps were taken and who was involved in each stage of the process.

RESPONSE: Syngenta has previously produced discoverable documents related to these topics in the Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710, litigation. Syngenta further refers Plaintiff to the studies and reports submitted to EPA, label changes (addressed earlier herein), and the research and education materials discussed in its March, 1995, Chapter 20 Product Stewardship submission to the EPA, Bates Pages SYN00858808-SYN00861007, and its monitoring data which is detailed in various EPA submissions and are accessible via the USEPA web sites detailed in response to Interrogatory 32 below.

Further examples of Syngenta's efforts include the following: Ciba-Geigy pro-actively established three approaches to help address the occurrence of atrazine in surface water in the major corn, sorghum and sugarcane producing states: (1) implementation of surface water monitoring programs, (2) implementation of a communications program to inform the state level market and regulatory organizations of the EPA-OPP approved FIFRA label changes to increase protection of groundwater and surface water, and (3) research regarding and communication of the role of best management practices (BMPs) include reducing the movement of herbicides, soil, and nutrients in surface water runoff from agricultural fields.

Atrazine Monitoring Programs by Ciba-Geigy (1975-1990)

One action was the initiation of voluntary monitoring programs in 1975-1976, 1982-1985, 1986-1987, and 1987-1990 on the three (3) major central United States Rivers (Mississippi, Missouri and Ohio Rivers) as well as twenty-one (21) smaller rivers and streams in ten (10) states with a history of atrazine use. These monitoring programs were established prior to the development of the existing MCL of 3 ppb which was released in 1988 and became enforceable starting in 1993 under the SDWA. The Atrazine HAL prior to 1988 was 150 ppb.

As noted in detail in Syngenta's response to Interrogatory number 7, Ciba-Geigy initiated a monitoring program in 1975 on the Mississippi, Missouri, and Ohio Rivers as well as eight (8) smaller rivers in Illinois, Iowa, and Kansas in response to EPA release of information in the fall of 1974 that atrazine was observed in New Orleans drinking water obtained from the Mississippi River.

Ciba-Geigy also added two monitoring sites on the Mississippi River from 1982-1984 (Helena, AR and Greenville, MS). Additionally, smaller river/stream/reservoir sites were monitored in 1986-1987 in Illinois (3 sites), Indiana (4 sites), Iowa (4 sites), Louisiana (1 site), Michigan (4 sites), Minnesota (1 site), Nebraska (1 site), Ohio (1 site), and South Dakota (1 site).

The data for the Mississippi, Missouri and Ohio Rivers and the data for the rivers/streams in 1975-1976 and twenty-one (21) rivers/streams in 1986-1987 show that the atrazine individual and annual /period means were well below the atrazine HAL of 150 ppb for that time period.

Atrazine Monitoring Programs (1993-Present)

In June 1993, Ciba started the VMP with nineteen (19) Community Water Systems (CWS) in Illinois. The VMP was conducted from 1993 through February 2003 in Illinois and other states (Iowa, Indiana, Ohio, Missouri, Texas, Kansas, Louisiana, and Kentucky). All CWSs participating did so on a voluntary basis from year to year.

Syngenta then initiated an Atrazine Monitoring Program (AMP) (2003-present) upon the conclusion of the VMP and as part of an MOA and EPA-OPP-FIFRA Special Review and Data Call-In's by the USEPA. Syngenta refers plaintiffs to the EPA Interim Reregistration Eligibility Decision for the parameters of the AMP, which is on the EPA atrazine website.

The Stewardship Voluntary Monitoring Program (SVMP), initiated in 2007, is a frequent atrazine monitoring program, for raw and finished water, that includes CWSs that have been released from the AMP by EPA-OPP after fulfilling the atrazine reregistration requirements. Syngenta covers all costs for sample shipment, analysis and data reporting to the CWS enrolled in the SVMP.

Communication of Best Management Practices (BMP) Research to Corn, Sorghum and Sugarcane Growers

Best Management Practices (BMPs) are actions that dealers and farmers include in their business plans and activities. BMPs are utilized by the grower community to: eliminate agricultural chemical loss from storage, mixing, and loading activities due to spills; reduce the amount of herbicide loss in surface water runoff when used in the field; and simultaneously reduce soil erosion and water runoff from fields.

Two (2) review papers were developed in 1992 by Ciba-Geigy to distribute to growers and dealers in the major corn, sorghum and sugarcane states. One report was entitled, "Best Management Practices to Reduce Runoff of Pesticides into Surface Water: A Review and Analysis of Supporting Research," Technical Report 9-92, Ciba-Geigy Agricultural Groups. A shorter summary report was also developed and entitled, "Reducing Herbicide Runoff: Role of Best Management Practices," Technical Report 10-92, Ciba-Geigy Agricultural Group. In addition to the technical reports, the review information was also published in the Journal of Soil and Water Conservation in 1994. The paper is entitled, "The Impact of Conservation Tillage on Pesticide Runoff into Surface Water: A Review and Analysis," Vol. 49 (2):126-135 by Richard Fawcett, Dennis Tierney, and Brian Christensen.

In addition to the development of the BMP review papers, Ciba-Geigy provided various research grants to support further small-scale field investigations on, among other things, the effectiveness of grass buffer strips and tillage practices in reducing the loss of atrazine from fields. The research was conducted by scientists at Iowa State University, Kansas State University, University of Nebraska, Texas A & M University, and Virginia State University in the 1990s and up to 2006. Additionally, Plaintiff has been provided or obtained additional information through subpoenas regarding many research projects and studies with/from third party entities/organizations such as the MO Corn Growers Association (MCGA), ERC, etc.

Further responding, see all studies and reports submitted to EPA available through the EPA web sites set forth in previous responses to these Interrogatories, the March, 1995, Chapter 20 submission to the USEPA, Bates page numbers SYN00858808-SYN00861007, referred to above, and the Response to Interrogatories 18 and 19 above for additional responsive information. Syngenta also refers plaintiffs to The Triazine Herbicides--50 Years Revolutionizing Agriculture, Elsevier, B.V. Press (1st ed. 2008), particularly chapter 32 and the references included in that chapter, and Chapter 5 of Triazine Herbicides Risk Assessment, ACS Symposium Series 683, Ballantine, et al, 1998, at pp. 49-58.

30. Identify and describe any research and development department or division that you have had perform work relating to atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites. The description is to include, but not be limited to, the name of each such department or division, the date the department or division was created, each person involved with input into or control over the research and development pertaining to atrazine, atrazine-containing products, atrazine degradates and/or atrazine metabolites since you first began making or selling the products, and the nature of the research conducted.

RESPONSE: See the Syngenta Crop Protection, LLC organizational chart previously produced regarding Syngenta's Research and Development groups and for information responsive to this Interrogatory. Further responding, the numerous studies undertaken by Syngenta or on its behalf have been previously identified in multiple lists provided in the case of *Holiday Shores Sanitary District, et al v. Syngenta Crop Protection, LLC f/n/a Syngenta Crop Protection, Inc., et al,* Case No. 04-L-000710, and are also available on the EPA public docket and web sites set forth in response to Interrogatory 32 below.

Further responding, Syngenta states that there are basically 4 stages through which a new product (active ingredient) goes from initial research/development until it is placed on the market. The 4 general steps that differentiate these development stages are generally as follows:

Stage 1: A molecule is discovered in the research laboratory and researchers work to define the molecular structure as a candidate of choice for further development. This stage is under the full control of crop protection research. The goal of this stage is to find a molecule with the desirable biological effects that is needed to satisfy a market need.

Stage 2: This stage is considered a fitness evaluation. Researchers look at the molecule's chemical profiles, safety profiles and biological profiles. If at this stage it is deemed to be fit then the molecule is promoted to full development. At this stage a candidate for development has been defined.

Stage 3: At this stage the product is only one chemical or active ingredient. Toxicology studies continue. Dietary residue studies and the environmental field studies are initiated. Also, it should be noted that in late Stage 1, and continuing through Stages 2 and 3, there is field testing being conducted in key markets. The latter part of Stage 1 through Stages 2 and 3 is not a sequential process and is generally occurring simultaneously.

Stage 4: This stage consists of a combination of regulatory approval, marketing and sales.

31. Identify by name, job description, and current (or last known) business address of each person who has supplied any answers or information for, or assisted in locating any documents or tangible things for your answers to these interrogatories and/or responses to the accompanying requests for production.

RESPONSE: See Verification. Besides Syngenta's in-house legal counsel and staff and its outside legal counsel and staff; the following Syngenta persons assisted in the preparation of responses to the First Interrogatories, or assisted in obtaining information related thereto so that its responses could be prepared:

i. Janis McFarland, Ph.D., Head, Regulatory Affairs NAFTA, Syngenta Crop Protection, LLC, Greensboro, NC. Principally involved in atrazine matters since initiation of Special Review in 1994.

ii. Charles Breckenridge, Ph.D., Sr. Science and Technology Fellow, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in toxicological atrazine research.

iii. Tim Pastoor, Ph.D., Principal Scientist, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in toxicological atrazine research.

iv. Dennis Tierney, Ph.D., retired Syngenta employee, Greensboro, NC. Consultant on atrazine stewardship.

v. Brian Christensen, BCC, Inc., Minnetonka, MN. Consultant on atrazine monitoring and stewardship.

vi. Andrew Merritt, Technical Expert III, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine monitoring.

vii. Peter Hertl, Ph.D., Head, Product Safety Americas, Syngenta Crop Protection, LLC. Involved in atrazine research and monitoring.

viii. David Volz, Ph.D., former Syngenta employee, University of South Carolina, Columbia, SC. Involved in eco-toxicological atrazine research.

ix. David Flakne, Sr. State Government Relations Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship. Responsible for state government relations in various states, including Iowa, Illinois, Indiana and Ohio.

x. Alan Hosmer, Technical Expert V, Syngenta Crop Protection, LLC, Greensboro, NC, Involved in eco-toxicological atrazine research.

xi. Ron Williams, Ph.D., Stewardship Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship.

xii. Dan Campbell, Regulatory Affairs Team Leader, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine registration.

xiii. Kevin Gesse, Brand Manager CM3, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with strategies for herbicide marketing and purchases of atrazine by Syngenta.

xiv. Dennis Kelly, State Affairs Team Lead, Syngenta Crop Protection, LLC, Greensboro, NC. Oversees state government relations on behalf of Syngenta; involved in atrazine stewardship; interacts with various agricultural, trade, and industry third parties and groups.

xv. Todd Barlow, State Government Relations Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in atrazine stewardship; responsible for state government relations in various states, including Missouri, Kansas, and Nebraska.

xvi. Paul Hendley, Senior Science & Technology Fellow, Product Safety, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with ecological studies, fate and transport, and certain SAP hearings/matters.

xvii. Chris Harbourt, Adjunct Assistant Professor, Agriculture & Bioengineering, University of Illinois, and Principal Engineer for Waterbourne Environmental, Inc., Champaign, IL. Involved in the development and application of modeling and the application of field instrumentation technology to address chemical partitioning, degradation, and dispersion on atypical and complex urban and agricultural settings.

xviii. Sherry Ford, former Community Outreach, former Senior Communications Manager, Syngenta Crop Protection, LLC, Greensboro, NC. Previously involved with media and communications.

xix. Steven Goldsmith, former Senior Communications Manager at Syngenta Crop Protection, LLC, Greensboro, NC; currently employed at Syngenta Bio-Technology, Inc., Research Park Triangle, NC. Previously involved with media and communications.

xx. Ann Bryan, Senior Manager, External Communications-Crop Protection, Greensboro, NC. Involved with media and communications.

xxi. Gene Hill, former Syngenta Crop Protection, Inc., employee now with Olsten Staffing for assigned activities within Syngenta Crop Protection, LLC, Greensboro, NC, including biological data summarization, EPA registration activities for multiple active ingredients, and source of historical information.

xxii. Dennis Hackett, Team Lead Compliance and Regulatory Support, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in regulatory compliance.

xxiii. Jim Wojciak, Senior Technical Manager, Technical Support, Customer Care, Commercial Operations, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in customer contact, service and complaints.

xxiv. Harvey Minnick, Global Manager Data Privacy/Records, Records Retention, Syngenta Crop Protection, LLC, Greensboro, NC. Involved with records retention.

xxv. Nina Heard, Science & Technology Fellow, Operator & Consumer Risk Assessment, Syngenta Crop Protection, LLC, Greensboro, NC. Knowledgeable re atrazine chemistry and breakdown products.

xxvi. Madan Verma, Analytical Manager, Analytical and Product Chemistry, Technology/Products, Syngenta Crop Protection, LLC, Greensboro, NC.

xxvii. Gordon Vail, Senior Technical Brand Manager, Technical Support, Customer Care, Commercial Operations, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in application technology.

xxviii. Chuck Forsman, Senior Technical Brand Manager, Herbicide Brand Management, Syngenta Crop Protection, LLC, Greensboro, NC. Involved in application technology.

xxix. Steven Wall, Technical Leader II, Greensboro, NC. Involved in environmental safety.

xxx. Larry Gasper, Science and Technology Fellow, Greensboro, NC. Knowledgeable re atrazine chemistry and breakdown products.

xxxi. Alan Camp, Purchasing Manager 3, Procurement. Involved in raw materials purchasing and atrazine production operations in the U.S.

33. Identify and describe all studies, surveys, reports, or other investigations done by you or at your request, direction, or expense (in whole or in part), or of which you are aware relating to the health effects of atrazine, atrazine-containing products, any atrazine related compound, and/or constituents or degradates of such products or compounds. In your response, please include

a. The name(s) and address(es) of the author(s)/researcher(s) responsible for each study, survey, report, or other investigation;

b. The date(s) of each study, survey, report, or other investigation;

c. The amount that you paid to the author(s) or researcher(s) responsible for each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

d. The amount that you paid to the laboratory, organization, institution, or other entity at which each study, survey, report, or other investigation was performed;

e. The instruments, materials, methods, doses, and controls used in each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) and why these instruments, materials, methods, doses, and controls were chosen;

f. How each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) was developed;

g. The purpose(s) of each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

h. Your reaction to the finding(s) of each study, survey, report, or other investigation; and

i. The governmental entity(ies) to whom you reported the finding(s) of each study, survey, report, or other investigation and when these findings were reported.

RESPONSE: Syngenta states that there are voluminous materials on the USEPA web site which are responsive to this Interrogatory. Generally, EPA has atrazine specific information, or links to atrazine or related information, at the following sites:

1. The USEPA also has the following web site: http://www.epa.gov/oppsrrd1/reregistration/atrazine/. This is what may be termed the general USEPA Atrazine web page. It lists all of the Docket Information, including various docket information relating to the:

- USEPA's Review of Atrazine;
- EPA's Special Review Process for Atrazine;
- Atrazine Reregistration Risk Assessments; and the
- FIFRA SAP materials associated with the 2003 Atrazine Reregistration and the 2009 Atrazine Evaluation, including the SAP separate Docket ID numbers for all of the SAP Hearings.

This web site also lists in detail and links to (which are described more fully below):

- Atrazine Updates (as of April 28, 2011) through March, 2011;
- Decision Documents related to Atrazine; and
- Various Federal Notices related to Atrazine.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

2. The USEPA also has the following web site: http://www.epa.gov/oppsrrd1/reregistration/atrazine/atrazine_update.htm. This site contains information related to atrazine re-registration and atrazine updates, including:

- The Atrazine Evaluation Process;
- Triazine Cumulative Risk Assessment;
- Atrazine Post-IRED Results, including the OPP's Monitoring in Community Water Systems, Ecological Watershed Monitoring Program, Cancer and Amphibians.
- This page also has search boxes on the right hand side of the screen re Atrazine SAP Meetings and Atrazine Evaluation.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

3. The USEPA also has the following web site: http://www.regulations.gov/#!docketDetail;D=EPA-HQ-OPP-2003-0367. This site contains information related to the Atrazine "Docket Folder Summary," or what is commonly called the Atrazine Public Docket. The USEPA Docket ID Number is EPA-HQ-OPP-2003-0367. The home page of that Folder Summary is entitled: "Atrazine: Notice of Availability of Revised Atrazine Interim Reregistration Eligibility Decision (IRED)." Contained within that web site (as of April 28, 2011) are 209 items in the Docket Folder. These items include:

- 137 Public Submissions;
- 71 items of Supporting and Related Material; and
- 1 Notice.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data,

materials or documents located in, on or through any of these web sites.

4. Additionally, the USEPA has the following web site: http://www.epa.gov/pesticides/chemical/foia/cleared-reviews/reviews/080803/080803.htm. This site contains it Freedom of Information Act (FOIA) page for Atrazine, and the Index of Cleared Science Reviews for Atrazine (PC Code 080803). Adobe Reader is needed to view many of the files on this page. As of April 28, 2011, this page contained links to and/or pdf's of various scientific reviews ranging in date from at least 1964-2006. These are among the approximately 6,000 studies that USEPA has considered regarding Atrazine.

Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through any of these web sites.

5. For comprehensive data sets, USEPA has multiple sites which are all listed on the following link: http://www.epa.gov/pesticides/science/models_db.htm#databases. Syngenta advises plaintiffs that it intends to rely upon, reference or utilize any of the data, materials or documents located in, on or through these web sites or any of its links. These are among the approximately 6,000 studies that USEPA has considered regarding Atrazine.

In particular, Syngenta advises Plaintiffs that if they access the web site http://www.epa.gov/pesticides/science/models_db.htm#databases, a search window appears. The USEPA Science and Policy page appears which lists models and databases. If Plaintiffs type in (search for) atrazine, as of April 28, 2011, 614 results appear all related to the Science: Science and Policy collection. Syngenta intends to rely upon, reference or utilize any or all references, sources or content set forth therein. In addition, a box appears in the upper right hand portion of that aforesaid page entitled: "Related Searches." If Plaintiffs click in that search box on "risks atrazine," 5,450 results regarding atrazine are listed in all areas of the USEPA web site. Syngenta also intends to rely upon, reference or utilize any or all data, materials, documents, references, sources or content set forth therein. These are among the approximately 6,000 studies that USEPA has considered regarding Atrazine.

Further responding, Syngenta refers Plaintiffs to the *in vitro,* epidemiology, animal toxicity studies and reports on the public docket available through the aforesaid USEPA web sites, including those produced to Plaintiffs in the *Holiday Shores* litigation. In particular, Syngenta directs Plaintiffs to:

- The FAO/WHO Meeting on Pesticide Residues (JMPR) 2007;
- Syngenta's Atrazine Review: Prepared for the WHO-FAO/JMPR Committee: Final Report, Report Number T011389-06;
- The USEPA's RED in 2003;
- The Cumulative Risk Assessment performed by USEPA in 2006; and
- The 3 SAP White Papers, including their bibliographies that have been submitted in conjunction with various SAP hearings.

In addition, Syngenta previously provided the *HSSD* Plaintiffs two (2) exhibits listing thousands of studies that may be considered to be responsive to Interrogatories 32, 33, and/or 34.

Moreover, see responses to Interrogatory 5 above and the list of studies/articles provided therewith (in the interests of time and the spirit of cooperation encompassed in the Rules, Syngenta conducted a particular search which generated the attached lengthy list, which may contain some studies that do not relate to atrazine or may otherwise be irrelevant; by producing this particular list, Syngenta does not waive any objections it may have to the production, use or admissibility of any particular study/item disclosed on said list). In addition to the above, Syngenta also refers Plaintiff to the list of studies, previously produced, allegedly obtained from the USEPA via a FOIA request by the *Huffington Post* which was available on its website; The Triazine Herbicides--50 Years Revolutionizing Agriculture, Elsevier, B.V. Press (1st ed. 2008); Residue Reviews, Volume 32, "The Triazine Herbicides 1970," and the references cited therein; Triazine Herbicides Risk Assessment, American Chemical Society Symposium Series 683 published in 1998, for more historical information and information which may be considered responsive to this Interrogatory.

34. Identify and describe all studies, surveys, reports, or other investigations done by you, at your request, direction, or expense (in whole or in part), or of which you are aware relating to the fate and transport of and/or the contamination of water resources by atrazine, atrazine-containing products, any atrazine related compound, and/or constituents or degradates of such products. In your response, please include:

a. The name(s) and address(es) of the author(s)/researcher(s) responsible for each study, survey, report, or other investigation;

b. The date(s) of each study, survey, report, or other investigation;

c. The amount that you paid to the author(s) or researcher(s) responsible for each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

d. The amount that you paid to the laboratory, organization, institution, or other entity at which each study, survey, report, or other investigation was performed;

e. The instruments, materials, methods, doses, and controls used in each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) and why these instruments, materials, methods, doses, and controls were chosen;

f. How each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) was developed;

g. The purpose(s) of each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

h. Your reaction to the finding(s) of each study, survey, report, or other investigation; and

i. The governmental entity(ies) to whom you reported the finding(s) of each study, survey, report, or other investigation and when these findings were reported.

RESPONSE: See response to Interrogatory 32 above. Further responding, see the studies and reports (including the ecological toxicity studies) on the public docket or available through the USEPA web sites listed above, including the SAP proceedings referenced in response to Interrogatory 16 above. Syngenta also refers the Plaintiffs to the USEPA documents which it has provided in its document production served in response to Plaintiff's First Requests for Production in the instant case or in the Holiday Shores Sanitary District et al. v. Syngenta Crop Protection, Inc. et al., Cause No. 2004-L-000710, litigation.

In addition, Syngenta previously provided the *HSSD* Plaintiffs two (2) exhibits listing thousands of studies that may be considered to be responsive to Interrogatories 32, 33, and/or 34. Moreover, see responses to Interrogatory 5 above and the list of studies/articles provided therewith (in the interests of time and the spirit of cooperation encompassed in the Rules, Syngenta conducted a particular search which generated the attached lengthy list, which may contain some studies that do not relate to atrazine or may otherwise be irrelevant; by producing this particular list, Syngenta does not waive any objections it may have to the production, use or admissibility of any particular study/item disclosed on said list).

Further responding, to the extent that they might not be included on the previously produced exhibits of studies/investigations, and even though certain of these studies have been produced in the past, Syngenta identifies the following studies/reports as partially responsive to this Interrogatory:

EXAMPLES OF STUDIES and REPORTS INCLUDE:

Technical Reports:

a. A Review of Historical Surface Water Monitoring for Atrazine in Iowa, 1975-1993 Technical Report 2-94.

b. A Review of Historical Surface Water Monitoring for Atrazine in eleven States in the Central United States (1975-1991) July 1992 Technical Report: 11-92.

c. Investigation of Atrazine in Hoover Reservoir Columbus, Ohio, November 1991 (Blasland & Bouck Engineers, P.C.)

d. Historical Surface Water Monitoring for Atrazine in the Mississippi River near Baton Rouge - St. Gabriel, Louisiana, Technical Report: 1-92.

e. Investigation of Atrazine in Hoover Reservoir Columbus, Ohio, Volume II - Water Quality Model; January 1992 (Blasland & Bouck Engineers, P.C.)

f. Herbicides in Drinking Water Sources: A Treatment Technology Overview, Technical Report: 2-92.

g. A Review of Surface-Water Monitoring for Atrazine in the Chesapeake Bay Watershed (19761991) July 1992 Technical Report: 3-92.

h. Atrazine and Drinking Water Sources: A Preliminary Exposure Assessment for Iowa, Technical Report: 1-94.

i. Atrazine and Drinking Water Sources: A Preliminary Exposure Assessment for Illinois, Technical Report 3-93.

j. Atrazine and Drinking Water Sources: An Exposure Assessment for Populations using the Greater Mississippi River System, Technical Report: 2-93.

k. A Review of Historical Surface Water Monitoring for Atrazine in Illinois (1975 -1988) Technical Report: 5-92.

l. Reducing Herbicide Runoff: Role of Best Management Practices, Technical Report: 10-92.

m. A Review of Historical Surface Water Monitoring for Atrazine in the Mississippi, Missouri, and Ohio Rivers, 1975-1991, Technical Report: 6-92.

n. Best Management Practices to Reduce Runoff of Pesticides into Surface Water: A Review and Analysis of Supporting Research, Technical Report: 9-92.

o. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Indiana 1996, Technical Report: 5-97.

p. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Illinois 1994, Technical Report: 2-95.

q. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Iowa 1994, Technical Report: 4-95.

r. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Missouri 1994, Technical Report: 5-95.

s. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Missouri 1995, Technical Report: 4-96.

t. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Iowa 1995, Technical Report: 2-96.

u. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Louisiana 1996, Technical Report: 7-97.

v. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Illinois 1995, Technical Report: 3-96.

w. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Iowa 1996, Technical Report: 6-97.

x. Voluntary Atrazine Monitoring Program Topeka, Kansas Community Water System 1996, Technical Report: 9-97.

y. Voluntary Atrazine Monitoring Program Marlin, Texas Community Water System 1996, Technical. Report: 10-97.

z. Predicted Atrazine Concentrations in the Great Lakes: Implications for Biological Effects, Technical Report: 1-97.

aa. Human Exposure to the Herbicides Atrazine and Simazine in Drinking Water; Technical Report: 2-97.

bb. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Missouri 1996, Technical Report: 8-97.

cc. New England States Review of Surface and Groundwater Data for Atrazine and Simazine Concentrations in Community Water Systems, Rural Wells and Surface Water, Technical Report: 14-97.

dd. Ecological Risk Assessment of Atrazine Concentration in the Great Lakes using Distributional Methods, Technical Report: 1-98.

ee. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Illinois 1996, Technical Report: 4-97.

ff. Evaluation of Sampling Methods for Estimating Annual Mean Concentrations of Atrazine in Community Water Systems, Technical Report: 5-96.

gg. Voluntary Atrazine Monitoring Program at Selected Community Water Systems: Louisiana 1995, Technical Report: 1-96.

hh. Biological Assessment of Atrazine and Metolachlor in Rainfall, Technical Paper: 1-93.

As noted previously, Syngenta has conducted or is involved in, and continues to conduct or be involved in, drinking water and ecological surface water monitoring programs and ecological and surface water research, planning and work, which have been and will continue to be produced to Plaintiffs. Moreover, Syngenta has given various presentations to stakeholders, grower representatives, governmental agencies and professional societies/groups, etc. Syngenta's investigation continues as to the information responsive to this Interrogatory. However, examples of such presentations include:

a. **Presentation Title**

Atrazine Monitoring Program Results and Atrazine Label Education, Evansville, IL, February 27, 2007

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

b. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, November 13, 2003

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

c. Presentation Title

Using Atrazine and Protecting Water Quality, A Guide for Corn and Grain Sorghum Producers, Gillespie, IL, Watershed Mitigation Meeting, March 26, 2004
Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

d. **Presentation Title**

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, November 29, 2004

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

e. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, March 9, 2005

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

f. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, November 22, 2005

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

g. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, March 22, 2006

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

h. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, November 13, 2006

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

i. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, February 28, 2007

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

j. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, November 13, 2007

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

k. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, April 24, 2008

Authors/Addresses

Ronald W. Williams, Jr., Ph.D.
Syngenta
410 Swing Road, Greensboro, NC

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

l. Presentation Title

Atrazine Watershed Mitigation Plan for Gillespie Lake Watershed: Stakeholder Meeting, December 2, 2008

Authors/Addresses

Ronald W. Williams, Jr., Ph.D.
Syngenta Crop Protection, Inc
410 Swing Road, Greensboro, NC

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

m. Presentation Title

Illinois EPA Meeting, September 11, 2006, Springfield, Illinois
Stewardship Mitigation Proposed Plan to Address Notice of Violation for the Herbicide Atrazine for Evansville, Illinois CWS

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

n. Presentation Title

Atrazine and Total Chloro-Triazine (TCT) Concentrations in Surface Water from the Syngenta Atrazine Monitoring Program for the Mount Olive Community Water System, Mount Olive, Illinois, 1993-2005 YTD, March 10, 2005

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)

Brian R. Christensen,
Brian Christensen Companies, Inc
4300 Camelot Dr., Minnetonka, MN

o. Presentation Title

Watershed-Scale Field Aeration and Herbicide Incorporation to Enhance Crop Protection and Water Quality: A BMP Case Example (1977-2000). Presented to Macoupin County project stakeholders, August 2, 2001

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta).
Dozier, USDA-NRCS; D. McCandless, Macoupin County SWCD, Carlinville, IL;
J. Hatfield, USDA-ARS, Ames, IA;
W. Becker, Central Illinois Agricultural Research Farms

p. Presentation Title

EXPOSURE TO THE HERBICIDES ATRAZINE AND SIMAZINE IN DRINKING WATER IN 21 MAJOR USE STATES (1993-1997). Presented to Weed Science Society Annual Meeting, February 1999

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
J. Clarkson, Montgomery Watson, Boulder, CO
B. Christensen, N. Hines, C. Mattan, and C. Dando, En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

q. Presentation Title

EXPOSURE TO THE HERBICIDES ATRAZINE AND SIMAZINE IN DRINKING WATER IN ILLINOIS (1993-1997). Presented to Illinois EPA, March 1999.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
J. Clarkson, Montgomery Watson, Boulder, CO
B. Christensen, N. Hines, C. Mattan, and C. Dando, En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

r. Presentation Title

EXPOSURE TO THE HERBICIDES ATRAZINE AND SIMAZINE IN DRINKING WATER IN 21 MAJOR USE STATES (1993-1998). Presented to Soil and Water Conservation Society, August, 1999

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
B. Christensen, C. Mattan, and C. Dando,
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

s. Presentation Title

Population Linked Drinking Water Exposure Assessment (PLEX) for Atrazine and Simazine for Community Water Systems in 31 Major Use States From 1993 Through 1999 Programming and Structure;

Population Linked Drinking Water Exposure Assessment (PLEX) for Atrazine and Simazine for Community Water Systems in 31 Major Use States From 1993 Through 1999 Part B Exposure Assessment Results. Presented to USEPA – OPP, October 24, 2001.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
B. Christensen, C. Mattan, and C. Dando,
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

t. Presentation Title

Syngenta Voluntary Monitoring Program for Atrazine With Selected Community Water Systems (CWS) on Surface Water in Nine States 1993-2000. Presented to the USEPA-OPP, October 24, 2001.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta).
B. Christensen, and C. Dando,
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

u. Presentation Title

Exposure to the Herbicides Atrazine and Simazine in Drinking Water in 31 Major Use States in the United States (1993-1999). Presented to the European Society of Environmental Toxicology and Chemistry (SETAC), May 2001.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta).
B. Christensen, C. Dando and Kendra Marut
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

v. Presentation Title

EXPOSURE TO THE HERBICIDES ATRAZINE, SIMAZINE AND METOLACHLOR IN DRINKING WATER IN 31 MAJOR USE STATES (1993-1999). Presented to Weed Science Society of America, February, 2001.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
B. Christensen, C. Dando and Kendra Marut
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

w. Presentation Title

EXPOSURE TO THE HERBICIDES ATRAZINE, SIMAZINE AND METOLACHLOR IN DRINKING WATER IN 32 MAJOR USE STATES (1993-2000). Presented to American Water Resources Association, May 12, 2003.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
B. Christensen, C. Dando and Kendra Marut
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

x. Presentation Title

A DRINKING WATER EXPOSURE ASSESSMENT FOR ATRAZINE, SIMAZINE AND METOLACHLOR IN 32 STATES, 1993-2000. Presented to American Water Resources Association, May 12, 2003.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
B. Christensen and C. Dando
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

y. Presentation Title

SPECIAL REVIEW OF ATRAZINE
Interim Registration Decision (IRED) and Memorandum of Agreement (MOA).
Presented to Illinois EPA, March 5, 2003.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta)
B. Christensen, C. Dando and Kendra Marut
En-fate, LLC
14280A 23rd Ave N, Plymouth, MN

z. Presentation Title

Illinois CWS on Surface Water Selected for Participation in Atrazine Monitoring Program (AMP) under EPA-OPP IRED and MOA. Presented to Illinois EPA, September, 2003.

Authors/Addresses

Dennis P. Tierney, Ph.D. (outside contractor formerly of Syngenta).
B. Christensen
Brian Christensen Companies, Inc.
4300 Camelot Drive, Minnetonka, MN

In addition to the above, Syngenta refers Plaintiff to The Triazine Herbicides--50 Years Revolutionizing Agriculture, Elsevier, B.V. Press (1st ed. 2008); Residue Reviews, Volume 32, "The Triazine Herbicides 1970," and the references cited therein; and Triazine Herbicides Risk Assessment, American Chemical Society Symposium Series 683 published in 1998, at pp. 158-76, 189-207, 208-26, 227-38, 239-51, 252-65, 266-81, 284-302, 303-21, and 336-46, for more historical information and information which may be considered responsive to this Interrogatory.

35. Describe all studies, surveys, reports, or other investigations done by you, at your request, direction, or expense (in whole or in part), or of which you are aware discussing the benefits, advantages, and/or disadvantages of atrazine, atrazine-containing products, any atrazine related compound, and/or constituents of such products as compared to other products. In your response, please include:

a. The name(s) and address(es) of the author(s)/researcher(s) responsible for each

study, survey, report, or other investigation;

b. The date(s) of each study, survey, report, or other investigation;

c. The amount that you paid to the author(s) or researcher(s) responsible for each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

d. The amount that you paid to the laboratory, organization, institution, or other entity at which each study, survey, report, or other investigation was performed;

e. The instruments, materials, methods, doses, and controls used in each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) and why these instruments, materials, methods, doses, and controls were chosen;

f. How each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) was developed;

g. The purpose(s) of each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

h. Your reaction to the finding(s) of each study, survey, report, or other investigation; and

i. The governmental entity(ies) to whom you reported the finding(s) of each study, survey, report, or other investigation and when these findings were reported.

RESPONSE: See response to Interrogatory 32 above and the studies, reports and documents submitted on atrazine benefits as part of the EPA Special Review Process, which are available from the EPA websites listed above. Further answering, see response to Interrogatory 35 below.

In addition, Syngenta previously provided the *HSSD* Plaintiffs two (2) exhibits listing thousands of studies that may be considered to be responsive to Interrogatories 32, 33, and/or 34. Moreover, see responses to Interrogatory 5 above and the list of studies/articles provided therewith (in the interests of time and the spirit of cooperation encompassed in the Rules, Syngenta conducted a particular search which generated the attached lengthy list, which may contain some studies that do not relate to atrazine or may otherwise be irrelevant; by producing this particular list, Syngenta does not waive any objections it may have to the production, use or admissibility of any particular study/item disclosed on said list).

Further responding, to the extent that they might not be included on the aforesaid exhibit of studies/investigations, and even though certain of these studies have been produced in the past, Syngenta identifies the following studies/reports as partially responsive to this Interrogatory:

STUDIES, REPORTS and INVESTIGATIONS

Studies (Efficacy and Crop Tolerance): Syngenta considers this category of information to mean field trials and these would number in the thousands. Syngenta has trial results stored in multiple data bases: Field Information System from 2009 to 1980: MARK IV containing University Cooperator trials from 1980 to ~1970: Field & Farm In-house trials from 1979 to ~1970, and Card File of In-house / Cooperator trials prior to 1970. If Plaintiffs desire these field trials, please request the same in writing from counsel for Syngenta.

Surveys and **Reports** cover a multitude of topics, including published literature in publicly available sources. Examples would include the journals / abstracts of Weed Science, Northeast Weed Control Conference, North Central Weed Control Conference, Southern Weed Science Society, Western Weed Science Society, Weed Technology, and many others over the course of ~50 years, most of which are in the public domain and equally available to Plaintiffs. State Extension publications relate to local interests and are also in the public domain. Further responding, see the public docket available from the EPA web site for studies, reports and investigations of interest to Plaintiffs, documents previously produced by Syngenta in its prior document productions to Plaintiff, and the previously produced **exhibits** regarding studies to the extent they may be deemed responsive to this Interrogatory.

Atrazine has been an active ingredient of many Masters of Science and PhD **theses** since the 1960s and are publicly available.

Other Investigations: There have been numerous economic studies using actual or modeled processes. A sampling of these is listed below:

- NAPIAP, 1992, "The Effects of Restricting or Banning Atrazine Use to Reduce Surface Water Contamination in the Upper Mississippi River Basin: A Summary," NAPIAP, USDA, Washington, D.C.

- Ackerman, F., "The Economics of Atrazine," International Journal of Occupational and Environmental Health, vol. 13 no. 4, October 2007, 441-449.

- Battelle, 1989, "Preliminary Benefit Analysis for Atrazine," Battelle Report to Ciba-Geigy, April, 1989, Columbus, Ohio.

- Battelle, 193, Hamblin, D. M. "Atrazine Withdrawal Impacts Update: An Addendum to Battelle's' Preliminary Benefit Analysis for Atrazine," April 1993, Dan Hamblin and Associates, Conway, Arkansas.

- Benefits of Triazine Herbicides in Reducing Erosion and Fuel Use in US Corn Production. Richard S. Fawcett, Fawcett Consulting. Huxley, IA 50124

- Bridges, David C. 1998. A Simulation Analysis of the Use and Benefits of Triazine Herbicides. Ch. 3 in Triazine Herbicides Risk Assessment. Edited by Larry G. Ballantine, Janis E. McFarland, and Dennis S. Hackett. ACS Symposium Series 683.

- Carlson, G. A. 1998. Costs Impacts if Atrazine or Triazines Were Not Available to Growers. Ch. 4 in Triazine Herbicides Risk Assessment. Edited by Larry G. Ballantine, Janis E. McFarland, and Dennis S. Hackett. ACS Symposium Series 683.

- CEEPES, 1993, USEPA, "Agricultural Atrazine Use and Water Quality: A CEEPES Analysis of Policy Options," Water and Agricultural Policy Division, USEPA, September 1993, Washington, D.C.

- CEEPES, 1994, Lakshminarayan, P.G. et al., "Corn and Sorghum Herbicides and Water Quality: An Evaluation of Alternative Policy Options." Staff Report 94-SR 70, September 1994, CARD, Ames, Iowa.

- Coursey, D. Illinois Without Atrazine: Who Pays?, The Heartland Institute: 2. (2007).

- Coursey, D. "Jobs, Safety and Informed Choices," National Corn Growers Association, July 7 and 12, 2010;

- Coursey, D. "No Atrazine in Illinois," PowerPoint.

- Coursey, D. "Letter to the Editor," Omaha World-Herald (July 1, 2010).

- Coursey, D. "Jobs, safety and informed choices," Des Moines Register.

- Danielson, L.E., et al., 1993, "Ground Water Contamination and Costs of Pesticide Restrictions in the Southeastern Coastal Plain" with Appendix B, "The Economic Effects of Selected Changes in Pesticide Regulation" by L. P. Gianessi and C. A. Puffer, Water Resources Research Institute, Report No. 273, North Carolina State University, Raleigh, North Carolina.

- Pike, D. R., et. al., 1994 but undated: "Field Corn and Soybean Pesticide Use and Insecticide Cluster Assessment," University of Illinois, Urbana, Illinois.

- Ribaudo, M. O. and A. Bouzaher, 1994, "Atrazine: Environmental Characteristics and Economics of Management," AEC Report 699, USDA, ERS, Washington, D.C.

- Twenty Years of University Corn Yield Data: With and Without Atrazine. Richard S. Fawcett, Fawcett Consulting. Huxley, IA 50124

In addition to the above, Syngenta states that it has produced and will continue to produce documents and information related to its past and ongoing ecological and surface water research, planning and work. Additionally, Syngenta refers Plaintiff to The Triazine Herbicides--50 Years Revolutionizing Agriculture, Elsevier, B.V. Press (1st ed. 2008); Residue Reviews, Volume 32,

"The Triazine Herbicides 1970," and the references cited therein; and Triazine Herbicides Risk Assessment, American Chemical Society Symposium Series 683 published in 1998, for more historical information and information which may be considered responsive to this Interrogatory.

36. Describe all studies, surveys, reports, or other investigations done by you, at your request, direction, or expense (in whole or in part), or of which you are aware discussing economic effects resulting from the use or non-use of atrazine, atrazine-containing products, any atrazine related compound, and/or constituents of such products. In your response, please include:

a. The name(s) and address(es) of the author(s)/researcher(s) responsible for each study, survey, report, or other investigation;

b. The date(s) of each study, survey, report, or other investigation;

c. The amount that you paid to the author(s) or researcher(s) responsible for each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

d. The amount that you paid to the laboratory, organization, institution, or other entity at which each study, survey, report, or other investigation was performed;

e. The instruments, materials, methods, doses, and controls used in each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) and why these instruments, materials, methods, doses, and controls were chosen;

f. How each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part) was developed;

g. The purpose(s) of each study, survey, report, or other investigation done by you or at your direction, request, or expense (in whole or in part);

h. Your reaction to the finding(s) of each study, survey, report, or other investigation; and

i. The governmental entity(ies) to whom you reported the finding(s) of each study, survey, report, or other investigation and when these findings were reported.

RESPONSE: See response to Interrogatory 34 above, especially under Other Investigations listed in that response. Further responding, see the following articles, studies,

materials which Plaintiffs may find responsive to Interrogatories 35 and 36:

a. Baker, A.J. 1998. Estimating Feed Use: Background and Issues. USDA-ERS Feed Yearbook. USDA-ERS, Washington, DC. Online: http://usda.mannlib.cornell.edu/usda/ers/FDS-yearbook//1990s/1998/FDS-yearbook-04-03-1998.asc.

b. Carlson, G. 1998. Cost impacts if atrazine or triazines were not available to growers. In L.G. Ballentine, J.E. McFarland, and D.S. Hackett, eds., *Triazine Herbicides: Risk Assessment.* ACS Symposium Series 683, American Chemical Society, Washington, DC.

c. Coursey, D. Illinois Without Atrazine: Who Pays?, The Heartland Institute: 2. (2007).

d. Coursey, D. "Jobs, Safety and Informed Choices," National Corn Growers Association, July 7 and 12, 2010;

e. Coursey, D. "No Atrazine in Illinois," PowerPoint.

f. Coursey, D. "Letter to the Editor," Omaha World-Herald (July 1, 2010).

g. Coursey, D. "Jobs, safety and informed choices," Des Moines Register.

h. Dinan, T., C. Simons, and R. Lloyd. 1988. The Agricultural Sector Study: Impacts of Environmental Regulations on Agriculture. EPA 230-09-88-040, US EPA, Washington, DC. Online: http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0307B-01.pdf/$file/EE-0307B-01.pdf.

i. Dinan, T., M. Salassi and C. Simons. 1991. Farm-Level Impacts of Recent and Proposed Environmental Regulations on Selected Farm Types. *Agribusiness* 7:115-133.

j. Just, R.E., D.L. Hueth, and A. Schmitz. 2004. *The Welfare Economics of Public Policy: A Practical Approach to Project and Policy Evaluation*, 2nd ed. Edgar Elgar Publishing, Northhampton, MA.

k. Osteen, C., and F. Kuchler. 1986. Potential Bans of Corn and Soybean Pesticides. USDA-ERS Agricultural Economic Report Number 546. USDA-ERS, Washington, DC. Online: http://www.nal.usda.gov/ref/USDApubs/aer.htm.

l. Osteen, C., and F. Kuchler. 1987. Pesticide Regulatory Decisions: Production Efficiency, Equity, and Interdependence. *Agribusiness* 3:307-322.

m. Osteen, C., and L. Suguiyama. 1988. Losing Chlordimeform Use in Cotton Production: Its Effects on the Economy and Pest Resistance. USDA-ERS Agricultural Economic Report Number 587. USDA-ERS, Washington, DC. Online: http://www.nal.usda.gov/ref/USDApubs/aer.htm.

n. Ribaudo, M.O., and T.M. Hurley. 1997. Economic and Environmental Effects Associated with Reducing the Use of Atrazine: An Example of Cross-Disciplinary Research. *Journal of Agricultural and Applied Economics* 29:87-97.

o. Szmedra, P. 1997. Banning 2,4-D and the Phenoxy Herbicides: Potential Economic Impact. *Weed Science* 45:592-598.

p. Tauer, L.W. 1989. Economic impact of future biological nitrogen fixation technologies on United States agriculture. *Plant and Soil* 119:261-270.

q. Tauer, L., and J. Love. 1989. The potential economic impact of herbicide resistant corn in the USA. Journal of Production Agriculture 2:202-207.

r. Taylor, C.R. 1993. AGSIM: An Econometric-Simulation Model of Regional Crop and National Livestock Production in the Unites States. In C.R. .Taylor, K. Reichelderfer, and S. Johnson, eds., *Agricultural Sector Models for the United States: Description and Selected Policy Applications*. Ames, IA: Iowa State University Press.

s. Taylor, C.R. 1994. Deterministic versus stochastic evaluation of the aggregate economic effects of price support programs. *Agricultural Systems* 44:461-473.

t. Taylor, C.R., and R.D. Lacewell. 2009a. A Brief Description of AGSIM: An Econometric-Simulation Model of the Agricultural Economy Used for Biofuel Evaluation. BioEnergy Policy Brief BPB 070209. Auburn University, College of Agriculture, Auburn, AL. Online: https://sites.auburn.edu/academic/ag/group/bioenergy/AGSIM%20Description/AGSIM%20Description.pdf.

u. Taylor, C.R., and R.D. Lacewell. 2009b. Aggregate Economic Effects of Corn Ethanol and Soy-Based Biodiesel Production. BioEnergy Policy Brief BPB 070209. Auburn University, College of Agriculture, Auburn, AL. Online: https://sites.auburn.edu/academic/ag/group/bioenergy/Aggregate%20Economic%20Impacts%20of%20Expanded%20BioFuel%20Pro/Policy%20Brief%20Expanded%20Gen%201%20Biofuel.pdf.

v. Taylor, C.R., and R.D. Lacewell. 2009c. Effects of Corn Ethanol and Soy-Based Biodiesel Production on Soil Erosion and Return of Conservation Reserve Program Land to Crop Production. BioEnergy Policy Brief BPB 070409. Auburn University, College of Agriculture, Auburn, AL. Online: https://sites.auburn.edu/academic/ag/group/bioenergy/CRP%20%20Erosion%20Effects/CRP%20and%20Erosion%20Policy%20Brief.pdf.

w. Taylor, C.R., H.A. Smith, J.B. Johnson, and R.T. Clark. 1994. Aggregate economic effects of CRP land returning to production. *Journal of Soil and Water Conservation* 49:473-476.

x. Taylor, C.R., J.B. Penson, Jr., E. Smith, and R. Knutson. 1991. Economic Impacts of Chemical Use Reduction on the South. *Southern Journal of Agricultural Economics* 23:15-24.

y. U.S. Environmental Protection Agency (US EPA). 1997. The Benefits and Costs of the Clean Air Act, 1970 to 1990. US EPA, Washington, DC. Online: http://www.airimpacts.org/documents/local/coveretc.pdf.

z. U.S. Environmental Protection Agency (US EPA). 2002. Clear Skies Initiative: Technical Addendum - Methodologies for the Benefit Analysis. US EPA, Washington, DC. Online: http://www.airimpacts.org/documents/local/Tech_adden.PDF.

aa. White, J.M., P.G. Allen, L.J. Moffitt and P.P. Kingsley. 1995. Economic analysis of an areawide program for biological control of the alfalfa weevil. *American Journal of Alternative Agriculture* 10:173-179.

bb. Bridges, D.C., C.K. Kvien, J.E. Hook and C.R. Stark. 1990. *An analysis of the use and benefits of pesticides in U.S.-grown peanuts: II Southeastern Production Region.* NESPAL Report 1990-002, 220 pgs., University of Georgia.

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ddddddd. Woodyard AJ, Bollero GA an Riechers DE, Broadleaf weed management in corn utilizing syngergistic postemergence herbicide combinations. *Weed Technology*; 23:512-518 (2009).

eeeeeee. Woodyard AJ, Hugie JA and Riechers DE, Interactions of mesotrione and atrazine in two weed species with different mechanisms for atrazine resistance. *Weed Science*; 57:369-378 (2009).

fffffff. Hugie JA, Bollero GA, Tranel PJ and Riechers DE, Defining the rate requirements for syngergism between mesotrione and atrazine in redroot pigweed (*Amarnathus retroflexus*). *Weed Science*; 56:265-270 (2008).

36. Identify and describe all communications with other atrazine manufacturers concerning potential health effects related to atrazine, atrazine-containing products, any atrazine related compound, and/or constituents of such products.

RESPONSE: Syngenta is in the process of a rolling production and will produce any non-privileged, relevant, responsive documents related to, among other things, any communications with other registrants that may be responsive to this Interrogatory, subject to FIFRA confidentiality rules. To the extent deemed responsive, the registrants have certain communications related to FIFRA Data Compensation proceedings when they occur, and such discussions may have related to access to documents (some of which may have related to human health issues) for purposes of those proceedings. Registrants also confer regarding data call-in's and Scientific Advisory Proceedings regarding the charge questions and their materials to be presented at the SAP hearings, some of which have involved human health issues as set forth in response to Interrogatory 17 above. Syngenta has had some telephone updates and occasional in-person meetings with other registrants regarding various matters, including issues arising from the USEPA's Memorandum of Agreement and data generation related thereto, and the Endocrine Screening Task Force regarding the proposed tests/studies related to USEPA's proposed Tier One endocrine screening tests, and possible waivers related thereto.

37. Identify and describe each action taken by you to investigate or research members or potential members of the EPA Scientific Advisory Panel.

RESPONSE: Syngenta objects to Interrogatory 37 on the grounds that the same seeks information which is irrelevant and immaterial to any issue in this case, seeks information which is not reasonably calculated to lead to the discovery of admissible evidence at trial, and is beyond the scope of permissible discovery.

38. For each study or analysis performed by Syngenta or anyone on behalf of Syngenta for the purpose of modeling or tracing the fate and transport of atrazine or atrazine degradates or metabolites from any place of application to any watershed, any body of water, or any source of water used by any community water system:

a. State the date of the study;
b. Identify each person involved in the study;
c. Identify each place of application involved;
d. Identify each watershed, each body of water, and each source of water used by any community water system involved;
e. Describe how the study was performed;
f. Identify any report of the results of the study.

RESPONSE: See the following eco-toxicology and fate and transport SAP proceedings before the USEPA which Plaintiffs may deem responsive to this Interrogatory. The papers, studies, PowerPoint presentations and comments are all available to Plaintiffs on the EPA docket and web sites noted below and in response to Interrogatory 32 above:

a. U.S. Environmental Protection Agency
FIFRA SCIENTIFIC ADVISORY PANEL (SAP)
OPEN MEETING
December 4 -7, 2007
FIFRA SAP WEB SITE http://www.epa.gov/scipoly/sap/
OPP Docket Telephone: (703) 305-5805
Docket Number: EPA-HQ-OPP-2007-0934
"Interpretation of the Ecological Significance of Atrazine Stream-Water Concentrations Using a Statistically-Designed Monitoring," including papers, studies and PowerPoints submitted in conjunction therewith;

b. FIFRA SCIENTIFIC ADVISORY PANEL (SAP)
OPEN MEETING
May 12-15, 2009
FIFRA SAP WEB SITE http://www.epa.gov/scipoly/sap/
OPP Docket Telephone: (703) 305-5805
Docket Number: EPA-HQ-OPP-2009-0104
"Scientific Issues Associated with The Ecological Significance of Atrazine Effects on Primary Producers in Surface Water Streams in the Corn and Sorghum Growing Region of the United States (Part II)," including papers, studies and PowerPoints submitted in conjunction therewith;

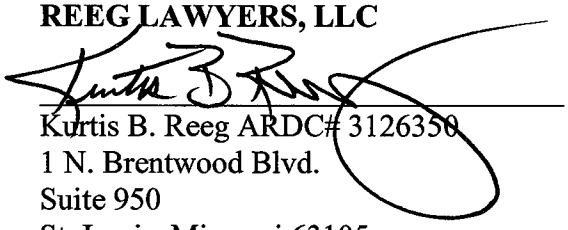
c. FIFRA SCIENTIFIC ADVISORY PANEL (SAP)
OPEN MEETING
September 14 - 17, 2010
FIFRA SAP WEB SITE http://www.epa.gov/scipoly/sap/
OPP Docket Telephone: (703) 305-5805
Docket Number: EPA-HQ-OPP-2010-0481
"Reevaluation of the Human Health Effects of Atrazine: Review of Non-cancer Effects and Drinking Water Monitoring Frequency," including papers, studies and PowerPoints submitted regarding Charge to Panel - Question 4.0: Approaches To Evaluating Water Sampling Strategies And Frequency Of Monitoring.

Fate modeling with which Syngenta has worked includes work regarding the PRISM and principal component modeling. Steve Bartell was involved with respect to the eco-toxicology aspects of modeling, and Brian Christensen and Chris Harbourt (both identified above), have also worked on the modeling with Syngenta.

AS TO OBJECTIONS ONLY:

Respectfully submitted,

REEG LAWYERS, LLC

By: 

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ATTORNEYS FOR DEFENDANT
SYNGENTA CROP PROTECTION, LLC, f/n/a
SYNGENTA CROP PROTECTION, INC.

VERIFICATION

COMES NOW Syngenta Crop Protection, Inc., by and through Janis McFarland, being duly sworn, on her oath, and deposes and states that: she is the Head of Regulatory Affairs for Syngenta Crop Protection, LLC, f/n/a Syngenta Crop Protection, Inc; she is authorized to act on behalf of Syngenta Crop Protection, LLC with respect to its Responses (only) to Plaintiff's First Set of Interrogatories; that these Responses are partial responses only and will need to be supplemented; said partial Responses were prepared by attorneys for Syngenta Crop Protection, LLC, with the assistance of past or present employees of Syngenta Crop Protection, LLC, and documents in the possession of Syngenta Crop Protection, LLC; she has personal knowledge of certain of the partial Responses (or portions thereof), which Responses are based on her personal knowledge and which Responses are true and correct; and she does not have personal knowledge of certain other partial Responses (or portions thereof), which Responses were based on the assistance of past or present employees of Syngenta Crop Protection, LLC, and documents in the possession of Syngenta Crop Protection, LLC, which partial Responses are true and correct to the best of her present knowledge, information and belief.

SYNGENTA CROP PROTERCTION, LLC.

By: Janis E McFarland

Janis McFarland
Head of Regulatory Affairs

SUBSCRIBED AND SWORN TO before me this 9th day of May, 2011.

Brenda Alley

Notary Public

My Commission Expires: January 5, 2012

Dated: May 9, 2011

BRENDA ALLEY
Notary Public
Guilford County
NORTH CAROLINA
My Commission Expires
01/05/2012

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the 9th day of May, 2011, I caused to be served the attached sent **e-mail** and via **United States Mail**, properly addressed and postage paid, upon the following counsel:

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and

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CITY OF GREENVILLE, ILLINOIS, et al

Sarah L Suedkamp