



2020 Atrazine Use (Legal and Illegal) Inspections Report

Wisconsin Department of Agriculture, Trade and Consumer Protection
Agricultural Resource Management Division
Environmental Quality Unit
Final (3-04-21)

Introduction

The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) Agrichemical Management (ACM) Bureau is responsible for assuring compliance with Wisconsin Statue ATCP 30 - Pesticide Product Restrictions ([Wis. Stat. ch. 30](#)). Within that chapter, Subchapter VIII deals specifically with the legal and illegal use of any herbicide that contain the active ingredient atrazine. This report documents 2020 DATCP ACM inspections associated with atrazine legal- and illegal-use relative to Wis. Stat. ch. 30.31-30.37 rules, and provides a summary of the inspection program findings and trends.

Wisconsin's general restrictions and requirements for atrazine use have not changed since 2010. It is illegal in Wisconsin to apply any pesticide containing the active ingredient atrazine within an atrazine Prohibition Area (PA). Outside of a PA, atrazine use is restricted but not prohibited. Currently, there are no PAs under consideration for repeal (Wis. Stat. ch. 30.375), or any active or under consideration research exemptions (Wis. Stat. ch. 30.38).

Atrazine in drinking water remains a concern. The 2016 DATCP statewide survey of agricultural chemicals in groundwater indicated atrazine or one of its metabolites was detected in 26.4% of private drinking water wells in Wisconsin. Regarding risk to human health, about 0.2% of the wells contained a total atrazine concentration exceeding the 3.0 micrograms per liter ($\mu\text{g}/\text{l}$ or parts per billion [(ppb)]) Enforcement Standard (ES) listed in Wisconsin Administrative Code (WAC) ch. NR 140.

Atrazine Prohibition Area (Illegal-Use) Inspections

An atrazine PA eliminates the ability to use a pesticide that contains the active ingredient atrazine within the designated boundaries. There are currently 101 atrazine PAs covering approximately 1.2 million acres within the state, of which about 272,000 acres are planted in corn (2019 data). PAs are established once a groundwater sample collected from a drinking water well is found to contain greater than 3.0 ppb atrazine plus metabolites, and a subsequent investigation reveals that nearby agricultural practices (non-point source) contributed to the atrazine exceedance.

DATCP ACM Environmental Enforcement Specialists (EES) have performed atrazine illegal-use inspections annually since 2008. An inspection is performed on a field in agricultural production to check on compliance with Wis. Stat. ch. 30.37, which states that *"no person may apply atrazine in a prohibition area listed in the rule"*. The goal for 2020 was to perform one atrazine illegal-use inspection for each EES territory (13 total). Typically, inspections are performed during the growing season shortly after July 31, and on an existing field planted with corn.

PROGRAM APPROACH AND SELECTION CRITERIA

The first step is to select an agriculture field to inspect. Criteria used for field selection are listed below.

- The Environmental Quality (EQ) Unit Program Manager identifies a field within the PA for the EES to inspect because atrazine concentration trends at nearby private drinking water wells are not decreasing at an expected or acceptable rate (based on a review of data associated with DATCP's Exceedance Well Sampling Program).
- Referral by neighbors that suggests atrazine may have been used on an agricultural field within the PA.
- Review by EES personnel of herbicide record sales where purchasers of atrazine are known to farm within PAs.
- EES personnel randomly select a field within the PA where corn is currently grown and has not been inspected prior

EES personnel meet with the agriculture field operator and/or owner and conducts a records check of three previous years, gathers information on the crops grown and the herbicides used on the selected field, and notes whether any herbicide product containing the active ingredient atrazine has been applied. The EES also collects two soil samples from the selected field to check for atrazine residues via DATCP's Bureau of Laboratory Services (BLS) laboratory. The laboratory results are submitted to the EQ Unit Program Manager for evaluation. EES personnel then complete a narrative form (ARM-ACM-453, rev 04/20) with figures and appropriate documentation, and submit to their supervisors and EQ Unit Program Manager.

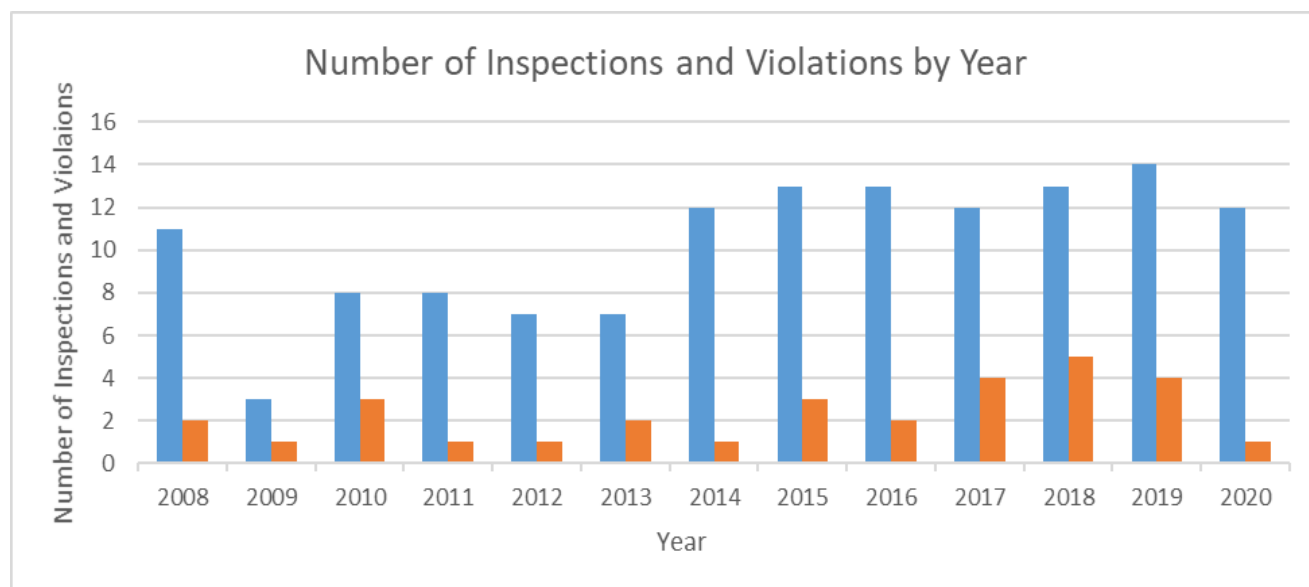
The illegal-use inspection locations are then identified on a layer on the DATCP Mapping Tool to document historical inspection information. This tool is used by EES and EQ Unit staff to identify previously inspected fields, and to identify future fields to target for inspection.

ILLEGAL-USE INSPECTIONS AND VIOLATIONS

In 2020, 12 inspections were performed in atrazine PAs with one violation recorded involving atrazine application within the PA. This illegal application occurred in 2020 within Chippewa County PA 93-09-02 by a commercial applicator. The responsible party indicated that they knew of the PA, but erred when scheduling fields to receive atrazine applications. None of the two soil samples collected from the field contained atrazine concentrations in excess of laboratory reporting limits (0.0300 parts per million [ppm]). The violator received a financial penalty, which was subsequently settled with the Agency.

Since 2008, 133 inspections were performed in atrazine PAs, yielding an overall violation rate of 23% (30 locations). Commercial applicators provided service for 62 (46.6%) of the fields inspected, yielding a violation rate of 30.6%. Self-applicators accounted for the remaining 71 inspected field with yielding a violation rate of 15.5%. [Table 1](#) provides a summary of violations versus inspections over time. A summary table of the atrazine illegal-use inspections over the years is provided in [Appendix A](#).

Table 1: Atrazine Illegal-Use Inspections and Violations



Notes: ■ Number of atrazine illegal-use inspections within stated year.
■ Number of violations associated with an atrazine illegal-use inspection within the stated year.

The atrazine illegal-use inspection program has encountered violations every year since inspection began in 2008. As shown, we can interpret that in 2020 we had a less percentage of violations in comparison to the previous five years. We do need to recognize that the EES personnel are searching for inspection locations with the greatest chance a violation may be occurring. We are using information that bias our field selection for inspections. A “more” random field selection approach would likely lower the number and percent of violations.

ATRAZINE IN SOIL SAMPLES

Overall, atrazine concentrations in excess of laboratory detection limits have been detected in 17.2% (22 out of 128 locations) of soil samples collected from fields associated with atrazine illegal-use inspection. In 2020, of the one violation (field location where atrazine was illegally applied), atrazine was not detected in excess of laboratory reporting limits in soil samples collected from the field. Over the course of the inspection program, of the 30 sites where atrazine was illegally applied to fields (self-reported by operator or applicator), atrazine was detected in soil samples from ten of the fields. The detected atrazine concentration ranged has been 0.0346 to 0.949 parts per million (ppm).

Over the course of the inspection program, the top three compounds that have been detected in soil are metolachlor, atrazine and acetochlor. Overall, over 15 different compounds have been detected greater than laboratory reporting limits in soil samples collected during the inspection program. [Table 2](#) depicts the compounds detected more than twice and their identified maximum concentration.

Table 2: Soil Sample Results for the Atrazine Illegal-Use Inspection Program

Pesticide Analyte	Count Of Analyte Detects	Maximum Concentration (in ppm)
Metolachlor	74	1.46
Atrazine	34	0.949
Acetochlor	31	2.18
Pendimethalin	10	2.96
Simazine	9	0.508
Boscalid	3	1.11
Tefluthrin	2	0.622
Terbufus	2	3.58
Chlordane	2	0.423
Chlorothalonil	2	1.76
Dimethenamid	2	0.146

Notes: ppm parts per million

Over the course of the inspection program, there have been atrazine detections in soil samples collected from eight fields where the operator or applicator did not admit or had records indicating atrazine was not applied to the field. One of these instances occurred in 2020. For these eight sites, for the most part, the detected atrazine concentrations have been very minimal. It is not known whether the atrazine detected is a:

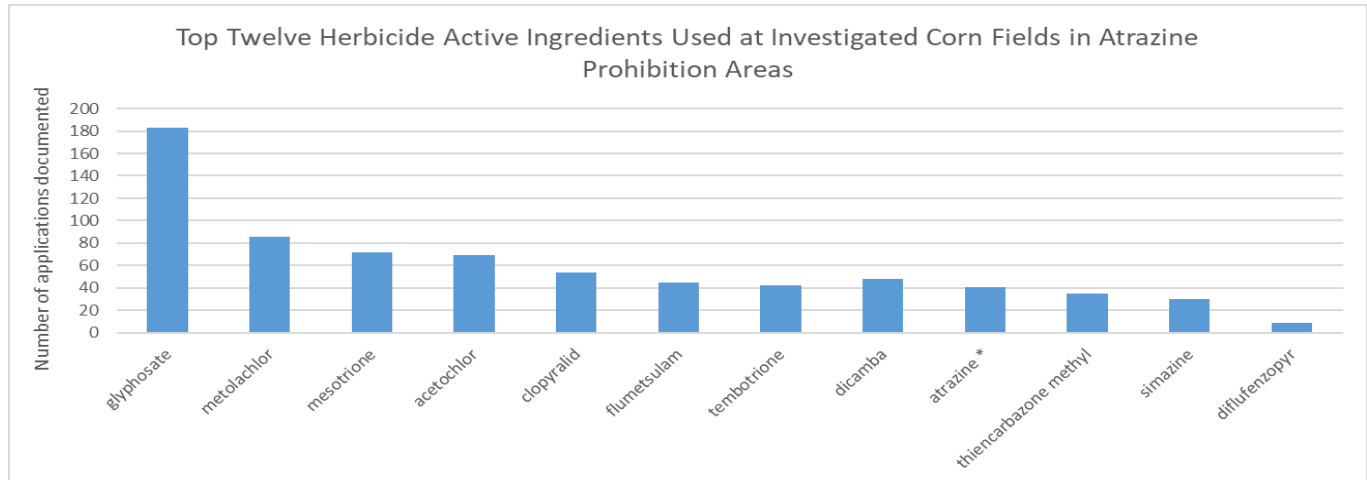
- Carry-over from previous use within the field (prior to the three-year record review conducted during the inspection);
- Atmospheric disposition;
- Equipment carry-over from equipment that was used at a field where atrazine was applied;
- Residue from atrazine applied at adjacent or nearby fields (that may be inside or outside the PA); or
- Actual illegal use on that field and not having proper paperwork, or the willingness to admit to the violation.

Currently, there is no reliable scientific understanding to explain the atrazine source or time of application in these type of scenarios. It is likely that the minimal detected concentration will not have a detrimental effect on local groundwater quality. However, if the detected atrazine concentrations are a result of illegal use (used prior to the three year inspection window, or falsified records or lack of cooperation by violator), the protocol of following up with the field operator and/or applicator would be implemented. Current DATCP protocol is to perform follow-up inspections if atrazine concentrations in soil samples exceed 0.25 ppm. The threshold for follow-up inspections has not been met for any soil samples collected to date.

HERBICIDES USED IN PAS

As part of the atrazine illegal-use inspection in a PA, EES staff also collect crop and herbicide information for the current year and previous two years. A compilation of this information indicates that over 55 different active agrichemicals have been applied on the investigated corn fields within PAs inspected. By far the most commonly used herbicide active ingredient is glyphosate. Table 3 shows the top twelve herbicides used on the cornfields inspected within PAs. Based on the biased approach for field selection and the inspection information collected, atrazine is the ninth most common active ingredient used on fields within the PAs.

Table 3: Herbicide Use Recorded During Atrazine Illegal-Use Inspection Program



Notes: * Illegal use of atrazine
 ■ Number of times agrichemical was reportedly applied to inspected fields.

Note, glyphosate has not been analyzed as part of the inspection program’s soil sampling. Based on chemical composition, it is unlikely that glyphosate will migrate from soil and impact groundwater quality. Because glyphosate is so widely used, DATCP requested that BLS develop an acceptable protocol and method to reliably determine for the presence and concentration of glyphosate, AMPA metabolite and glufosinate ammonium. In 2019, a successful pilot testing program was implemented to determine the validity of testing for glyphosate in water. However, limited laboratory capacity in 2020 prevented analyses of glyphosate and metabolic breakdown products for soil. If laboratory capacity is available, the 2021 soil sampling associated with the atrazine illegal-use inspections program will also include glyphosate, AMPA metabolite and glufosinate ammonium analysis.

Atrazine Legal-Use Inspections

An atrazine legal-use inspection is completed on a field with agricultural crops to verify compliance with Wis. Stat. ch. 30.31 and 30.32. The goal for 2020 was for each EES person (14 total) to complete one atrazine legal-use inspection within their territory. Typically, inspections are performed during the growing season for an existing field planted with corn. Records for the current season and the two prior years are reviewed as part of the inspection.

PROGRAM APPROACH AND SELECTION CRITERIA

The first step is to select an agriculture field to inspect. Criteria used for field selection are listed below.

- The EQ Unit Program Manager identifies a field outside of a PA for the EES to inspect either because of an on-going investigation or atrazine concentrations were detected in nearby private drinking water wells.
- Referral by neighbors that suggest potential atrazine use on the agricultural fields at excessive application rates.
- Review by EES personnel of herbicide record sales indicate atrazine sales.
- ESS personnel randomly select a field outside of a PA that has not been inspected and corn is currently being grown.

EES staff meet with the agriculture field operator and/or owner and conducts a records check, gathers information on the crops grown and the herbicides used on the selected field, and notes whether any herbicide product containing atrazine has been applied. If atrazine is applied, the inspector questions the rate of application and how it is determined (i.e. soil texture). EES staff then complete a narrative form (ARM-ACM-535, rev 04/20) with figures and appropriate documentation, and submit to their supervisors and the EQ Unit Program Manager for memorialization.

If a field selected for inspection has the infrastructure for an irrigation system, additional information is obtained to ensure compliance with Wis. Stat. ch. 30.31 (3). No person may apply irrigation water to any field that has been treated with atrazine for a two-year period following the application, unless they follow an acceptable Irrigation Management Program. If applicable, EES staff then discuss or review the Irrigation Management Program. The Irrigation Management Program must demonstrate procedures that ensure irrigation will not cause field moisture capacity in the soil's root zone to be exceeded.

No soil samples are collected as part of the atrazine legal-use inspection.

The legal-use inspection locations are then identified on a layer on the DATCP Mapping Tool. This is the same layer as the illegal-use inspection locations. This tool is used by EES and EQ Unit staff to identify previously inspected fields, and aid with selecting fields for future inspections.

LEGAL-USE INSPECTIONS AND VIOLATIONS

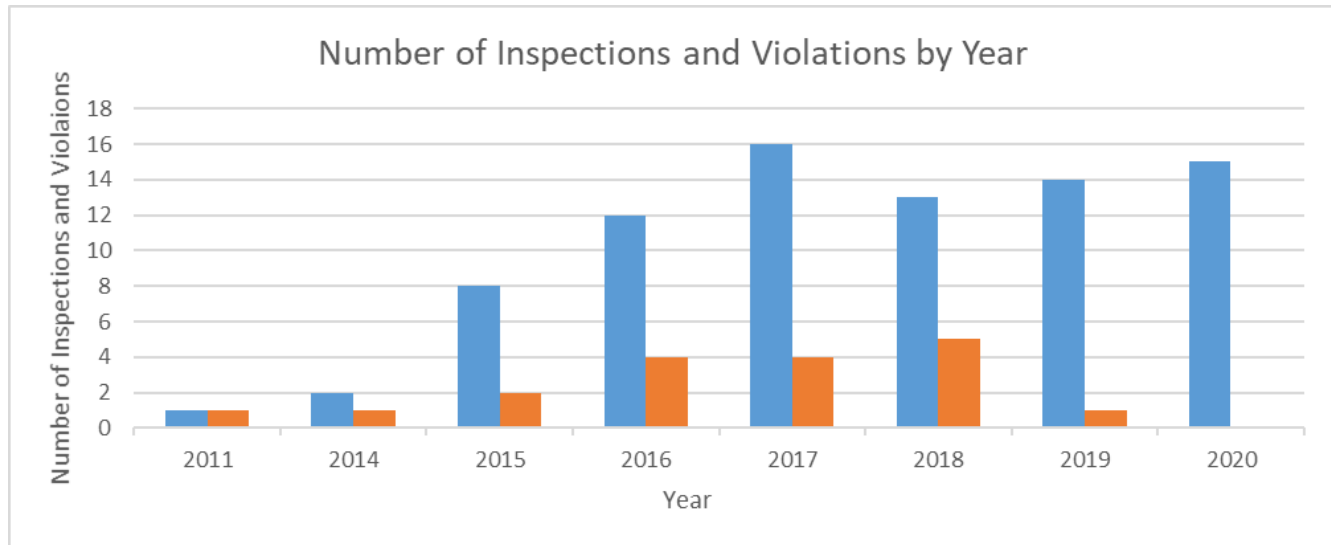
In 2020, 15 inspections were completed for atrazine legal-use outside PAs with no violations recorded. Irrigation was used at one field inspected in Waushara County

Since 2014, there have been 81 legal-use inspections completed, with a violation rate of 22.2% (18 locations). [Table 4](#) provides a summary of violations versus inspections by year. Commercial applicators provided service at 41 of the 80 (51%) fields inspected with a violation rate of 14.6%. Self-applicators accounted for the remaining 39 fields with a violation rate of 29.3%. Recorded violations can be separated into three categories described below.

- 61% of the violations (11 fields) are due to incomplete or improper recordkeeping.
- 28% of the violations (5 of the fields) are due to atrazine over application (i.e. applying at rates for fine or medium soil texture on course soil fields).
- 11% of the violations (2 fields) were for no or poorly developed/executed Irrigation Management Plans.

A summary table of the atrazine legal use inspections over the years is provided in [Appendix B](#).

Table 4: Atrazine Legal-Use Inspections and Violations



Notes: ■ Number of atrazine legal-use inspections within stated year.
■ Number of violations associated with an atrazine legal-use inspection within the stated year.

With the exception of 2020, violations have been recorded in every year of the program. For legal-use inspections, the violation rate for self-applicators (29.3%) is greater than commercial applicators (14.6%). The opposite trend was observed for illegal-use inspections. The greater violation rate for self-applicators outside of PAs is likely related to familiarity with the rules. Commercial applicators are more familiar with atrazine illegal-use rules, and more aware of the requirements because they work within and outside of PAs. Because self-applicators work mostly outside of PA, they may not be as familiar with the applicator rate rules.

IRRIGATION MANAGEMENT PLANS

Since EES staff started conducting atrazine legal-use inspections, 11 inspections were completed at fields that required an Irrigation Management Plan. In prior years, it was noted that the reviewed products were inconsistent with varying levels of detail, and little to no description of processes. Only two of the sites were issued warnings due to an absence of a plan, and a poorly developed and executed plan. However, EES staff reported that 50% of existing plans could use improvements. For the Waushara County site inspected in 2020, an acceptable Irrigation Management Plan was provided for review. That plan included installation of field moisture probes that were field checked by staff.

2021 Program Goals and Objectives

In 2021, the atrazine illegal- and legal-use inspection program will continue. Program goals are listed below.

- One atrazine illegal-use inspection will be completed inside a PA for 13 of the 14 EES territories (one EES territory has no PAs).
- Three additional atrazine illegal-use inspections will be completed inside PAs in Portage, Columbia and Sauk Counties to further evaluate atrazine concentrations observed in groundwater.
- One atrazine legal-use inspection will be completed for each EES territory.
- The DATCP database and mapping tools will be updated with 2021 inspection data.
- Revised inspection forms (ARM-ACM-435 and -535 rev 01/2021) will be used for 2021 inspections.
- A 2021 Summary Report will be completed at the end of the inspection season.

The EQ Unit has provided a number of recommended fields for both atrazine illegal- and legal-use inspections for 2021 field selection. For 2021, a greater focus will be placed on fields within PAs where commercial applicators are used and where irrigation is used.

ADDITION PROGRAM ACTIVITIES

In 2021, there will be some additional effort and focus beyond just the inspection-related work;

- Continue to seek outreach opportunities with the agriculture community to educate and discuss atrazine use rules and regulations.
- Further define what is included in an acceptable Irrigation Management Plan.
- EES training focused on setback regulations for atrazine applications near water bodies and drainage structures.

The proposed activities have been incorporated into the 2021 Pesticide Product Restrictions (Atrazine) Program Work Plan.

Additional outreach regarding the atrazine program that target the agricultural communities will be implemented in 2021. The goal is to reaffirm the rules and regulations, and provide a resource to address concerns and provide clarification. This outreach is intended to establish a process to discuss rules and educate applicators to improve atrazine use and non-use compliance.

An important component of atrazine use at irrigated fields is the Irrigation Management Plan. Based on EES observations to date, reviewed plans are inconsistent, and documentation of site-specific irrigation plans or best management practices could be improved. In 2021, the EQ Unit will look into developing better criteria around an acceptable Irrigation Management Plan. Subsequently, they will work with other DATCP personnel to develop some sort of outreach tool (flyer or presentation) that can be used to aid growers with improved plans and documentation requirement following plan implementation.

APPENDIX A

Table of Atrazine Illegal-Use Inspections

Atrazine Illegal-Use Inspections

updated January 28, 2021

Year	Inspections			Violations			Atrazine Detects in Soil	Year Notes
	Total	Private App	Commercial App	Total	Private App	Commercial App		
2008	11	11	0	2	2	0	1	Atrazine detect in soil at farm in PA 93-65-02; Walworth County. Letter of concern submitted. Other violation was improper records
2009	3	3	0	1	1	0	1	Atrazine illegally used by unlicensed applicator in PA 96-33-01, Lafayette County, and soil detects. Letter warning issued.
2010	8	6	2	3	2	1	2	Atrazine illegally used in PA 00-56-01 in St. Croix County (private applicator). No paperwork. No soil detects. Letter warning issued. Non-violation with soil detect associated with equipment carry-over. Second was record-keeping issue. Atrazine illegally used in PA93-65-01 in Walworth County (commercial applicator, Conserv FS-Zenda. No soil detects.
2011	8	6	2	1	1	0	1	Atrazine illegally used in PA 93-22-01 in Grant County (private applicator). Soil detects. Letter warning issued.
2012	7	0	7	1	0	1	1	Atrazine illegally used in PA 98-37-01 in Marathon County (commercial applicator, Central Wisconsin Cooperative). Soil detects. Letter warning issued.
2013	7	5	2	2	1	1	1	Atrazine illegally used in PA 93-48-01 in Pierce County (private applicator). Letter warning issued. Atrazine illegally used in PA 93-09-02 in Chippewa County (commercial applicator, Asgrow Services). No soil detects. Atrazine detect in soil collected within PA 93-57-04, which was not further investigated. Note; this does not include the seven United Coop locations where they self-identified in violation for atrazine application.
2014	12	5	7	1	0	1	2	Atrazine illegally used in PA 94-56-02 in St. Croix (commercial applicator, Countryside Cooperative). Soil detects. Atrazine detect in soil collected within PA 93-54-05, which was not further investigated.
2015	13	6	7	3	0	3	4	Atrazine illegally used in PA 93-09-01 in Chippewa County (commercial applicator, River Country Coop). Soil detects. Verbal warning issued. A second, atrazine illegally used in PA 93-09-01 in Chippewa County (commercial applicator, River Country Coop). Soil detects. Verbal warning issued. Atrazine illegally used in PA 93-09-02 in Chippewa County (commercial applicator, River Country Cooperative). No soil detects. Verbal warning issued. Atrazine detect in soil collected within PA 95-25-01, which was not further investigated. Atrazine detect in soil collected within PA 93-65-02, which was not further investigated.
2016	13	8	5	2	1	1	1	Atrazine detect in soil collected within PA 98-63-01, which was not further investigated. First and second violations were associated with improper records. Verbal guidance provided in both instances.

APPENDIX B

Table of Atrazine Legal-Use Inspections

Atrazine Legal Use Inspections

updated January 28, 2021

Year	Inspections			Violations			Inspection Notes	Irrigation	Method	In Compliance	Irrigation Notes
	Total	Private App	Commercial App	Total	Private App	Commercial App					
2011	1	1	0	1	1	0	Applied rate of 1 lb/acre in a coarse soil texture field in Jackson County. Letter warning issued.	0			
2014	2	0	2	1	0	1	no written irrigation plan for field in Chippewa County	1	none	0	Did not have a written Irrigation Management Plan.
2015	8	2	6	2	1	1	two violations due to improper record paperwork (Waushara [Heartland Farms] and Marathon [Amish] Counties). Verbal warning issued.	2	soil probes (commercial)	2	Did not inspect written plan, suspect one does not exist
2016	12	7	5	4	3	1	four violations due to improper record paperwork (Dodge, Eau Claire, Waushara [Insight FS] and Juneau Counties). Verbal warning for three and also written warning for lack of Irrigation Management Plan in Juneau County.	1	none	0	Written warning issued due to lack of Irrigation Management Plan
2017	16	10	6	4	3	1	three violations due to improper paperwork (Lincoln, Winnebago and Walworth Counties). Verbal warnings issued. Applied rate of 0.8 lb/acre in a coarse soil texture field in Columbia County. Verbal warning issued.	5	one hand textured (commercial in Chippewa County) and one soil probes	5	two of the five could use improvements
2018	13	7	6	5	3	2	three violations due to improper paperwork (St. Croix, Columbia and Juneau Counties). Verbal and written warnings issued. Both commercial violations were over application, 1.0 lb/acre (Rusk County Farm Supply) and 0.78 lb/acre (Allied Cooperative) in a coarse soil texture field in Rusk and Adams Counties, respectively. Written warnings issued.	1		1	
2019	14	6	8	1	1	0	the one violation is due to improper paperwork (Iowa County). Verbal warning issued.	0			
2020	15	6	8	0	0	0	No violations. However, a 2018 field with fine soils received a 1.5 lbs/acre. But no information on 2017 application.	1	probes in field and hand checked	1	
TOTALS	81	39	41	18	12	6		11		9	
		48.1%	50.6%	22.2%	29.3%	14.6%		13.6%		81.8%	