

# Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers



Some nursery and Christmas tree production practices can result in high risk of contamination to groundwater and surface water resources — including your drinking water supply. Others present low risk or virtually no risk at all. Your water supply is least likely to be contaminated if you follow appropriate management practices and dispose of hazardous and toxic wastes off the farm at a properly managed site.

The Crop Assessment System (Crop \*A\* Syst) will provide you with accurate information about how your management practices might be affecting water resources. When higher risk practices are being used, alternative lower risk practices are identified for use at your nursery. Your agricultural representatives can assist you in implementing lower risk management practices and maintaining profitable production.



# Crop\*A\*Syst

## Nursery Crop and Christmas Tree System Improvement Action Plan

Risk question	List high-risk practice(s) from Crop*A*Syst and medium-risk practices that do not meet MAEAP requirements	Required for MAEAP verification?	Management practice to reduce risk (include potential sources of technical and financial assistance)	Action plan	
				Planned completion date	Indicate date when completed
1.01	Example: Soil nutrient tests not up-to-date for all fields.	Yes	Perform soil tests on all fields going into new crops.	Sept. 2012	(✓) Completed March 20, 2012

*(continued after work sheets)*

I understand that this cropping system assessment (Crop\*A\*Syst) and corresponding Improvement Action Plan were developed on the basis that I have disclosed, to the best of my knowledge, all information pertaining to my nursery crop and Christmas tree cropping operations.

Farm address: Street _____ City _____ State _____ Zip _____ Watershed name: _____	Producer's signature _____ Date _____ <b>Crop*A*Syst conducted by:</b> Name _____ Title _____ Date _____
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## Introduction

Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers will assist you in developing and implementing a management plan that prevents contamination of groundwater and surface water resources and maintains economic crop production. Your plan will be in conformance with applicable Michigan Right-to-Farm guidelines and state and federal environmental regulations.

Nutrients used in nursery production come from chemical fertilizers and natural sources such as manure, compost, legumes and biosolids (sewage sludge). All nutrients, whether synthetic or naturally occurring, can become mixed with surface water or groundwater by natural processes such as runoff and leaching. Nitrate contamination of groundwater and phosphorus contamination of surface water are problems in Michigan. Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers will assess your current nutrient management practices and identify alternative management practices that, when implemented, will reduce nutrient losses to the environment.

Virtually all crops produced in Michigan may be threatened by serious pest problems — weeds, insects, mites and disease-producing organisms. Producers are encouraged to adopt pest management practices that achieve the desired quality while minimizing any adverse effects on non-target organisms, humans, and soil and water resources. Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers will assess your current pest management practices and will help to identify alternative management practices that, when implemented, will reduce negative impacts to the environment.

Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers is designed to coordinate the pollution prevention efforts of the Water Stewardship Program and the Cropping System of the Michigan Agriculture Environmental Assurance Program (MAEAP). Crop\*A\*Syst for Nurseries focuses on management practices in the field, whereas Farm\*A\*Syst focuses on activities at the farm headquarters, such as agricultural chemical storage, mixing and loading; water well construction and management; and other activities.

### **The Michigan Agriculture Environmental**

**Assurance Program** is a comprehensive, proactive and voluntary agricultural pollution prevention program. It takes a systems approach to assist producers in evaluating their farms for environmental risks. The three systems are Livestock, Farmstead and Cropping. The on-farm risk evaluation uses specific tools for each system — the comprehensive nutrient management plan (CNMP) or Livestock\*A\*Syst for the livestock system, the Farm\*A\*Syst for the farmstead system and the Crop\*A\*Syst for the cropping system. Environmentally assured systems are eligible for various incentives and recognitions.

**The Michigan Right-to-Farm Act**, PA. 93, was enacted in 1981 to provide farmers with protection from nuisance lawsuits. This state statute authorized the Michigan Commission of Agriculture to develop and adopt generally accepted agricultural and management practices (GAAMPs) for farms and farm operations in Michigan. These voluntary practices are based on available technology and scientific research to promote sound environmental stewardship and help maintain a farmer's right to farm. The current Right-to-Farm GAAMPs are posted on the Michigan Department of Agriculture Web site: [www.michigan.gov/mda](http://www.michigan.gov/mda).

Producers who complete the Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers will be able to determine what management and record-keeping changes (if any) will be needed for their cropping systems to be environmentally assured through MAEAP. Once a producer develops and implements a plan to address the risks indicated by the Crop\*A\*Syst assessment, he/she can contact the Michigan Department of Agriculture and Rural Development (MDARD) to request Cropping System verification. An MDARD inspector will schedule a site visit to complete the verification process.

P.A. 451, Part 82, ensures the confidentiality of the producer information you provide to the MDARD for system verification. Any information connected with the development, implementation or verification of a conservation plan or conservation practice is confidential.

As the owner of a MAEAP-verified cropping system, you will be eligible for various incentives and can enjoy “good-faith-effort” environmental liability protection if an agricultural pollution emergency ever occurs in your fields.

Similar incentives are available for producers who have environmentally assured their Livestock and Farmstead Systems. Contact your local Conservation District, MSU Extension or NRCS representative for a list of currently available incentives and information on how to get started.

## What is the Crop Assessment System for Nursery Crop and Christmas Tree Producers?

The Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers (Crop\*A\*Syst) is a series of risk questions that will help you assess how effectively your crop management practices protect groundwater and surface water resources. The risk questions are grouped in the following sections:

1. Nutrient Management Practices
2. Soil and Water Conservation Practices
3. Pest Management Practices

4. Irrigation Management Practices
5. Water Use
6. Nursery Container Management Practices
7. Other Environmental Risks in the Cropping System
8. Nursery and Christmas Tree System Improvement Action Plan

Each risk question assesses the impact of your production practices on groundwater and surface water resources. The risk question answers indicate whether management practices have a low, medium or high risk of contamination. Producers are generally recommended to adopt the low-risk management practices. Risk questions that address management practices that are regulated by state or federal law indicate **illegal practices with black bold print**.

Risk questions that address management practices covered by the Michigan Right-to-Farm Act indicate the **risk level required for protection from nuisance lawsuits with blue bold italic print**.

Finally, a blue box indicates the management level(s) required for MAEAP verification.

MAEAP management requirements are aligned with state and federal environmental regulations, the Michigan Right-to-Farm Act and environmentally based agronomic management practices that are supported by research. The records and/or plans that indicate the approved management practices have been implemented on the farm are listed in the far right column. This evidence will provide the basis for awarding environmental assurance through MAEAP.

Your agricultural representatives (both public and private) can assist you to make the appropriate management changes to become environmentally assured through MAEAP.

## How Does Crop\*A\*Syst Work?

- 1) Select all relevant risk question sections for your farm or nursery.
- 2) Answer the risk questions by selecting the answer that best describes management practices used on your farm. Indicate your risk level in the column to the right. Skip any questions that don't apply to your cropping system.

*Note: For MAEAP verification, complete the risk questions with a Crop\*A\*Syst trained individual. Your water stewardship technician is located in the Conservation District office.*

- 3) After completing each section of risk questions, list the practices that present a high risk of contaminating groundwater and surface water resources in the Nursery Crop and Christmas Tree System Improvement Action Plan (printed inside the front cover of the bulletin). Also include any medium-risk practices that do not meet MAEAP verification requirements.

- 4) In the Cropping System Improvement Action Plan, list:
  - Management practice(s) that you plan to implement that will reduce the identified risk.
  - Sources of technical assistance.
  - Target dates for accomplishing the changes.
  - Target date for MAEAP verification of your Cropping System.

## A Few Final Words

The key to Crop\*A\*Syst is that, once you have identified the risks to groundwater and surface water resources, you implement your plan to reduce the risk(s). Some of the stewardship practices that will reduce risks may cost very little and take very little time to implement. Other practices may involve additional cost and may not be implemented for a few years. It is important, however, to have a plan to follow.

Once you have developed a plan and have implemented changes to address the risks, you are ready for MAEAP verification of your Cropping System.

## Nutrient Management Practices

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>1.01)</b> How often are fields tested for nutrient levels (P, K, Ca, Mg) and pH?	<b><i>All fields are sampled and tested on a regular basis,</i></b> at 1 to 4 years, depending on crops being grown, and the cropping system.	Most fields are sampled and tested every 1 to 4 years. Producer plans to bring all field soil tests up-to-date.	Fields have not been tested within the past 4 years.		Field names or map. Acres in the cropped portions of the field. Up-to-date soil test reports, or schedule to bring all tests up-to-date.
<b>1.02)</b> Do soil sampling procedures adequately represent field conditions?	One composite sample taken from uniform field areas.		One composite sample taken from areas greater than 40 acres.		Soil types/soil maps demonstrating uniformity. Cropping histories. Proper soil sampling procedure.
<b>1.03)</b> Do you maintain the soil pH in the desirable range for the crop(s) being grown?	Soil pH maintained in the desirable range to enhance nutrient availability.		Soil pH not monitored or maintained in the desirable range.		
<b>1.04)</b> How are all sources of nutrients considered when making fertilization decisions?	<b><i>Credit taken for nutrients supplied by organic matter, legumes and manure or other biological materials</i></b> (biosolids). Fertilizer rates are reduced accordingly.	When organic matter, legumes, manure or other biological materials (biosolids, compost) are used, fertilizer rates are sometimes reduced.	When organic matter, legumes, manure or other biological materials (biosolids, compost) are used, rates are not reduced.		Written records indicate nutrient credits utilized.
<b>1.05)</b> How are fertilizer application rates determined?	<b><i>Consistent with Michigan State University (MSU) recommendations.</i></b> When MSU recommendations are not available, other land-grant university recommendations developed for the region may be used.	Occasionally exceed MSU or equivalent recommendations.	Often or always exceed MSU or equivalent recommendations.		Applications consistent with MSU recommendations. When MSU recommendations are not available, other land-grant university or equivalent recommendations developed for the region may be used.
<b>1.06)</b> How are nutrient management plans for each field annually developed and followed?	Annual nutrient plan is developed for each field meets crop nutrient needs and minimizes loss of nutrients to the environment.	A nutrient plan is developed each year for each crop management block. Soil tests are up-to-date.	Nutrient plan not developed or the same plan used for more than 4 years.		Annual nutrient plan by field or by crop grown.

A boxed risk level indicates the level required for environmental assurance (MAEAP) verification.

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**Blue print** (bold italic) indicates conformance with Right-to-Farm guidelines.

## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>1.07)</b> Is fertilizer application equipment checked for proper adjustment?	<b><i>Application equipment checked</i></b> annually <b><i>for rate of application and placement.</i></b> Over- and underapplications monitored and corrected.		Application equipment not checked.		Name of person responsible for fertilizer applicator adjustments and the dates of adjustments.
<b>1.08)</b> What soil nutrient management records are kept?	<b><i>Records of soil test reports and quantities of nutrients applied to individual fields are maintained.</i></b> Also, crop performance is evaluated.	Partial nutrient management records are kept. Complete nutrient management records will be kept in the future, for review at time of reverification.	Minimal or no nutrient management records kept.		<ul style="list-style-type: none"> <li>- Three years of records, or 5 years if applying manure, or plans to begin keeping records.</li> <li>- Soil fertility tests and/or plant analysis results.</li> <li>- Previous crop grown and yield harvested.</li> <li>- Date(s) of application(s).</li> <li>- Nutrient composition of fertilizer or other material used.</li> <li>- Amount of nutrient-supplying material applied per acre.</li> <li>- Method of application and placement of applied nutrients.</li> <li>- Vegetative growth and cropping history of perennial crops.</li> </ul>
<b>1.09)</b> When not in use, where are loaded planting and spray supply vehicles (trailers and trucks) parked to protect water resources from accidental fertilizer and pesticide spills and mischievous activities?	Supply vehicle is returned to a secure location when not in use. Fertilizer and pesticides (including treated seed) properly stored more than 150 feet down gradient from any well.		Fertilizer and pesticide (including treated seed) supply vehicle is left in an unsecured location. Or, Fertilizer and pesticides <b>stored less than 150 feet from any well.</b> <sup>1</sup>		Map showing areas adjacent to wells where vehicles should not be parked. No evidence of vehicles left in an unsecured location.

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>1.10)</b> How is manure and/or compost temporarily stacked in relation to surface water?	<i>Manure</i> and/or compost <b>stockpiles are kept a least 150 feet from surface waters or areas subject to flooding unless conservation practices are used to protect against runoff and erosion losses to surface waters.</b>		Manure and/or compost stockpiles are closer than 150 feet to surface waters or areas subject to flooding, and conservation practices are not used to protect against <b>runoff and erosion losses to surface waters.</b> <sup>4</sup>		Acceptable temporary manure and/or compost storage demonstrated. Adequate isolation from surface water.
<b>1.11)</b> For temporarily stacked manure and/or compost, how is the site managed to protect surface water, groundwater and/or neighboring properties?	<i>Manure</i> and/or compost <b>is managed in a manner to prevent runoff and/or leaching of nutrients to surface water or groundwater and to minimize odor impacts on neighbors.</b> Manure is stacked on impermeable surfaces (concrete, etc.) or compacted soils, and storage area contains a well-maintained barrier such as a wooden or concrete wall or earthen berm to trap runoff. Construction and management practices for composting are implemented using NRCS Composting Facility No. 317 standards.	Manure and/or compost is stacked on somewhat permeable, medium-textured soils. Partial or no barrier is used to trap runoff. However, runoff is diverted and passes through a vegetated filter strip or other treatment process.	Manure and/or compost is stacked on coarse-textured soils or above tile drains. No means of runoff or leachate control. Slope is toward surface water. Signs of runoff past perimeter of vegetated area or storage site, with runoff reaching surface water. <b>Runoff and/or leachate discharge directly to surface water.</b> <sup>4</sup>		Appropriate temporary manure and/or compost storage demonstrated. Adequate isolation from surface water.
<b>1.12)</b> How long is manure and/or compost stockpiled in the field?	<i>Manure is spread as soon as field and weather conditions allow, and does not exceed six months; or if covered with an impermeable cover, twelve months.</i>		365 days or more. Stacked in the same location each time.		Manure and/or compost not stacked for more than 365 days.

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>1.13)</b> Is clean water or runoff diverted away from the manure and/or compost storage site?	Clean runoff is diverted.	Clean water is not diverted but is captured, treated or stored.	Runoff is not diverted and is contaminated. Runoff water is not captured, treated or stored and <b>discharges directly to surface water</b> . <sup>4</sup>		Visual inspection of storage sites(s).
<b>Nitrogen Management Practices</b>					
<b>1.14)</b> How do you match nitrogen fertilizer applications to the demand of the crop and the conditions of the soil?	Controlled-release or split nitrogen fertilizer applications.	Single application where leaching or runoff potentials are low.	Single application where leaching or runoff potentials are high.		
<b>1.15)</b> What nitrogen fertilizer(s) are used?	Ammonium sources (anhydrous ammonia, urea, ammonium sulfate, sulfur-coated urea and other controlled-release nitrogen fertilizers). Nitrate sources that are controlled-release.	Nitrate sources (calcium nitrate, ammonium nitrate, nitrate N solutions including 28%) where leaching and runoff potentials are limited.	Nitrate sources where leaching and runoff potentials are high.		
<b>Field Phosphorus Management Practices</b>					
<b>1.16)</b> How are phosphorus fertilization rates determined?	<b>Based on soil tests or plant tissue analysis using Michigan State University</b> or equivalent <b>recommended rates</b> . If soil phosphorus test reaches 150 ppm Bray P1, P application is discontinued.	Phosphorus fertilization based on past practices, without regard to soil test P levels.	Phosphorus fertilization based on applying as much as is affordable.		P management consistent with Nutrient Management GAAMPs.

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>Field Phosphorus Management Practices</b> (continued)					
<b>1.17)</b> Where is the phosphorus fertilizer placed?	All nursery crops P is banded as a starter fertilizer at planting time, or P fertilizer is surface broadcast but incorporated when possible to prevent runoff or applied as a controlled-release fertilizer in container production.	P fertilizer is surface applied and not incorporated where runoff potentials are limited.	P fertilizer is surface applied and not incorporated where runoff potentials are high.		
<b>1.18)</b> How often is commercial phosphorus fertilizer applied on frozen or snow-covered fields?	Phosphorus fertilizer is never broadcast on frozen or snow-covered fields.	<b><i>Broadcast applications avoided on frozen or snow covered fields</i></b> and are not part of the nutrient management plan.	Phosphorus fertilizer is often broadcast on frozen or snowcovered fields.		Date(s) of application(s) of P fertilizers.

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>Manure Management Practices (If you do not use manure, skip this section.)</b>					
<b>1.19)</b> What manure management records are maintained?	Complete application <b>records of manure analysis, soil test results and rates of manure application for individual fields are maintained.</b>	Partial manure application records have been kept. Complete manure application records will be kept in the future, for review at time of reverification.	Minimal or no records maintained.		Additional records that are needed if manure is used in the nursery cropping system: <ul style="list-style-type: none"> <li>- Date(s) of manure/wastewater application(s) (calendar).</li> <li>- Source, rate and form of manure/wastewater applied.</li> <li>- Date, rate(s) and form of other nutrients applied.</li> <li>- Date(s) of incorporation.</li> <li>- Method of application (e.g., surface-applied, injected, irrigated).</li> <li>- Acres and area of field nutrients applied.</li> <li>- Weather and field conditions during application of manure (e.g., sunny, 70°F).</li> <li>- Recommended nutrient application rates.</li> <li>- Previous crops grown and yields.</li> <li>- Plant tissue sampling and testing reports (where applicable).</li> <li>- Presidedress nitrate test (PSNT) reports (where applicable).</li> <li>- Complete N, P, K nutrient budget by field.</li> <li>- Manure/wastewater quantities produced and nutrient analysis results.</li> <li>- Inspection and maintenance records.</li> <li>- Records of rental agreements or other agreements for application of manure/wastewater on land not owned by the producer.</li> <li>- Record of manure/wastewater sold or given away to other landowners.</li> </ul>

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>1.20)</b> How do you determine the nutrient content of manure?	<i>Laboratory analysis for percent dry matter (solids), ammonium N, and total N, P and K.</i>	Book values or standard nutrient content values used.	Manure nutrient content is unknown or not considered.		All manure analyses or book values on file.
<b>1.21)</b> How are desired manure application rates achieved?	Manure analysis (book value, manure test, or mass balance) and <i>field application rates are known.</i>		Manure application rate is not known.		Rate of manure applied is known for all spreaders. Records indicate date of calibration.
<b>1.22)</b> How is manure generally applied to fields?	<i>Manure is incorporated within 48 hours or injected into the soil, and/or conservation practices (residue management, rough tillage, cover crops, etc.) are used to protect against runoff and erosion losses to surface waters.</i>	Manure is generally surface-applied, and conservation practices are employed to reduce the risk of runoff.	Manure is applied in a manner that results in ponding, soil erosion losses, or manure runoff to adjacent property, drainage ditches <b>discharges directly to surface water.</b> <sup>4</sup>		Fields that receive manure application are properly managed.
<b>1.23)</b> How are streams, wetlands, farm ditches and other water bodies protected from manure runoff?	<i>Manure is injected or immediately incorporated. Or, surface applications are not done within 150 feet of surface water. Or, filter strips, riparian buffer strips, grassed waterways and other conservation practices are maintained between fields and surface waters on the farm and around surface water inlets.</i>	Conservation practices are maintained on some fields.	Manure is applied within 150 feet of surface waters and not incorporated without conservation practices. And/or, manure occasionally reaches neighbor's property.		Field maps with setbacks and conservation practices identified. Records of manure incorporation.
<b>1.24)</b> How are manure phosphorus application rates managed?	<i>If Bray P1 reaches 150 ppm, manure applications are discontinued.</i>		Manure application rates not based on soil test.		Manure rates do not exceed crop P needs.

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>1.25)</b> How are fields selected for manure spreading on frozen and snow-covered ground?	No winter applications.	Manure application risks index (MARI) is completed for each field receiving winter manure application. Fields receiving winter manure applications have met MARI criteria for Low or Very Low and <b><i>no liquid manure is applied on slopes greater than 3%, and no solid manure is applied to slopes over 6%.</i></b>	Applications made to fields where erosion and runoff to water resources are likely to occur.		Completed MARI for each field receiving winter manure application, or spreading plan that does not include winter spreading.
<b>1.26)</b> How do you control liquid manure loss through tile lines?	<b><i>Liquid manure is prevented from reaching tile lines.</i></b> Management practices are in place to prevent runoff to surface inlets. Tile line outlets are monitored.		Tile outlets are not monitored for manure discharge.		Tiled fields identified on map. Record of tile flow before and after application (flow, rate, color and odor).
<b>1.27)</b> Is manure managed to minimize odor?	The cropping system is managed to reduce the frequency and intensity of manure odors.		Manure odors are not minimized.		
<b>Biosolids Management Practices (If you do not use biosolids, skip this section.)</b>					
<b>1.28)</b> Has nutrient content information on the biosolids applied to the farm or nursery been received?	Received laboratory analysis for percent dry matter (solids), ammonium N (NH <sub>4</sub> -N), and total N,P and K and utilize nutrient credits when planning nutrient program.		Have not received any biosolids analysis information.		Biosolids analyses on file.

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## Nutrient Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>Biosolids Management Practices (If you do not use biosolids, skip this section.)</b>					
<b>1.29)</b> How are the rates of biosolids (in gallons or dry tons per acre) and applied biosolids nutrients known?	Received actual application rated from the biosolids generator or its land application contractor. Nutrient rates are consistent with MSU or equivalent recommendations.		Have not received any biosolids rate or nutrient application information.		Biosolids application records.

## Soil and Water Conservation Practices

<b>2.01)</b> Have environmentally sensitive areas been identified (land near surface water, highly erodible land, soils with high leaching or runoff potentials, wells, surface drains and inlets) that require additional management when applying nutrients and pesticides.	Environmentally sensitive areas are identified and protected. Family members, employees and contractors are aware of and understand the management practices to protect these areas.	Some environmentally sensitive areas are identified and protected.	Environmentally sensitive areas are not considered.		<p>Areas identified on field maps with appropriate management or setbacks.</p> <p>Areas:</p> <ul style="list-style-type: none"> <li>- Next to surface waters.</li> <li>- Fields with shallow groundwater.</li> <li>- Fields with water wells.</li> <li>- Areas near surface water inlets.</li> <li>- Fields with highly erodible soils.</li> <li>- Fields with highly leachable soils.</li> <li>- Surface drains.</li> <li>- Fields with high runoff potential.</li> </ul> <p>Training/communications plan to inform workers and contractors of appropriate management or setbacks.</p>
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## Soil and Water Conservation Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>2.02)</b> Is soil erosion under control on the nursery fields?	Soil erosion losses are within tolerances as documented by the revised universal soil loss equation (RUSLE2) and the wind erosion prediction system (WEPS). Minimal evidence of erosion and no evidence of concentrated water flows. Cover crop may be in place.	RUSLE2 and WEPS are run on fields that are not:  In pasture or hay ground, or no-till planting systems.  Receiving fall tillage, with >30% residue on less than 12% slopes.  Receiving more than one pass fall tillage that leaves fields rough with >40% residue and less than 8% slopes.  And regardless of fall tillage, spring tillage leaves > 20% residue.  And for all of the above there is no evidence of sheet, rill or gully erosion.	Excessive soil erosion is occurring on the nursery.		RUSLE2 and WEQ calculations completed for worst-case fields on the basis of soils, slopes, rotation, etc.
<b>2.03)</b> Do you protect all streams, wetlands, farm drainage ditches, irrigation ponds and other water bodies on your nursery from polluted runoff and sediment with conservation practices?	Filter strips, riparian buffer strips, grassed waterways and other conservation practices are maintained between fields and all surface waters at the nursery.	Conservation practices maintained on some fields.	No conservation practices maintained. Nursery stock grown immediately next to surface waters, drainage ditches and roads.		
<b>2.04)</b> Do you plant cover crops in fields and driving lanes to prevent soil erosion, trap nutrients and pesticides, and improve soil quality?	Cover crops are included in the crop rotation to protect	Cover crops used occasionally.	Cover crops not used.		

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## Soil and Water Conservation Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>2.05)</b> Are soil quality indicators evaluated?	Soil quality indicators (e.g., earthworm populations, water infiltration rates, soil compaction, percent plant and residue cover, pH, cation exchange capacity [CEC] and percent organic matter) are evaluated on all fields.	Some soil quality indicators are evaluated.	No soil quality indicators are evaluated.		
<b>2.06)</b> Are conservation and management practices routinely inspected and evaluated?	Owner or trained individual routinely inspects and evaluates conservation and management practices.	Conservation and management practices are informally evaluated during field operations.	Practices are not inspected nor evaluated.		

## Pest Management Practices

<b>3.01)</b> Are pesticides stored in the field?	Pesticides are not stored in the field.	Pesticides are stored in the field meeting all of the pesticide storage requirements from the FAS Section 3, Pesticide Storage and Handling.	Pesticides are stored throughout the year and do not meet all of the pesticide storage requirements from the FAS Section 3, Pesticide Storage and Handling.		Appropriate pesticide storage demonstrated.
<b>3.02)</b> Do you use integrated pest management (IPM) on your farm or nursery?	Pest identification, scouting information and thresholds are always used to manage pests and protect beneficial organisms.	The primary pests are known, but scouting information is not routinely utilized for control decisions.	Pesticides are utilized to control pests; thresholds are not considered.		

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## Pest Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>3.03)</b> How do you control weeds at your farm or nursery?	Herbicide selection and rates are based on weed species present; scouting and thresholds are utilized. Where appropriate, cultural and mechanical practices are used to suppress weeds and minimize weed seed survival (cultivation, crop rotation, certified seed, cover crops, mulch, etc.).	Preemergence and postemergence herbicides are selected on the basis of past performance, weed history, cost or ease of application.	Herbicides are selected primarily on the basis of price or ease of application. Little consideration is given to weed species present.		
<b>3.04)</b> How do you control insects and mites at your farm or nursery?	Treatment is always based on monitoring. Where available, biological pesticides (e.g., Bt), pheromones, cultural methods (resistant cultivars, field border management, etc.), and selective insecticides and miticides are used to protect beneficial organisms.	Insecticide and miticide treatments are sometimes based on monitoring and economic thresholds.	Insecticides and miticides are used as insurance or on a calendar schedule regardless of insect pressure or treatment thresholds.		
<b>3.05)</b> How do you control plant diseases at your farm or nursery?	Chemical use is based on disease prediction and scouting information. Diseases are managed through cultural methods where available (resistant cultivars, field and equipment sanitation, planting disease-free seed, monitoring vectors, etc.).	Chemicals are the primary method used to manage diseases. Spraying is done at the first sign of disease.	Crop is not monitored for disease. Spraying is based on the stage of plant development or calendar date.		
<b>3.06)</b> Does the farm or nursery comply with all MDARD nursery inspection requirements?	Farm or nursery works to comply with all MDARD nursery inspection requirements.		<b>Nursery does not work to comply with all MDARD nursery inspection requirements.<sup>9</sup></b>		

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## Pest Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>Pesticide Application</b>					
<b>3.07)</b> Do you consider soil characteristics and field conditions when making pesticide applications?	Soil characteristics (texture and organic matter) and field conditions (slope and moisture) are assessed when deciding on pesticide application practices. Site-specific or variable-rate technology may be used.	Whole-field application rates are based on the most vulnerable soil type in the field.	Pesticides are applied at full labeled rates without regard to vulnerable soil characteristics or field conditions.		
<b>3.08)</b> How are surface water and groundwater protected in and near fields from pesticide contamination?	Pesticide labels with groundwater and surface water advisory statements are followed.		<b>Labeled directions are not followed.</b> <sup>17</sup> Spray is applied adjacent to or over top of surface water, tile drain inlet or well. Field restrictions for shallow groundwater are ignored.		Field maps (risk question 2.01) indicating pesticide label setbacks and shallow groundwater restrictions are followed.
<b>3.09)</b> Are leaching/runoff and toxicity potentials considered when making pesticide decisions?	Pesticides with the lowest potentials for leaching, runoff and non-target toxicity are always selected for use in fields.	Leaching/runoff and toxicity potentials are occasionally considered when selecting soil-applied pesticides.	Pesticide choice is not based on leaching/runoff and toxicity potentials. Only cost and effectiveness are considered.		
<b>3.10)</b> Are the purchasers and applicators of restricted-use pesticides (RUP) certified applicators?	<b><i>The purchasers and applicators of RUP comply with the certification requirements.</i></b>		<b>Non-certified and unsupervised applicators use RUP.</b> <sup>6</sup>		RUP certification confirmed.

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## Pest Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>3.11)</b> Do you protect workers and pesticide handlers from exposure to pesticides?	<i><b>Workers and handlers:</b></i> - <i><b>Follow specific label requirements.</b></i> - <i><b>Are provided decontamination supplies.</b></i> - <i><b>Are trained or certified applicators.</b></i> - <i><b>Are informed of pesticide applications and reentry intervals.</b></i> - <i><b>Are provided personal protective equipment.</b></i> - <i><b>Are provided emergency assistance, if needed.</b></i>		<b>Worker Protection Standard requirements are partially met or ignored.<sup>19</sup></b>		Complete list of worker protection standards can be found at <a href="http://www.epa.gov/pesticides/health/workers.htm">www.epa.gov/pesticides/health/workers.htm</a> .
<b>3.12)</b> If pesticides are mixed and loaded in the field, how are they handled?	A mixing and loading pad is used. Mixing and loading are done more than 150 feet from any well and more than 50 feet from surface waters.	Mixing and loading are done in different locations in the field, more than 150 feet from a private well, more than 800 feet from a public well, and more than 50 feet from surface waters. A mixing and loading pad is not used.	Pesticides are mixed and loaded at the same spot in the field year after year without a mixing and loading pad.		Proper pesticide mixing and loading demonstrated.
<b>3.13)</b> How are empty pesticide containers rinsed and disposed?	<i><b>Containers triple rinsed or power rinsed, punctured</b></i> and returned to dealer, recycled, or taken to licensed landfill. Bags are returned to dealer or taken to licensed landfill.	<b>Disposal of empty containers and bags on the farm or nursery property.<sup>8, 17</sup></b>	<b>Disposal of partially filled containers. Burning of container on the farm or nursery property.<sup>8, 17</sup></b>		Evidence of containers being recycled or proper disposal.
<b>3.14)</b> Do pesticide applicators read and follow the label instructions?	<i><b>Everyone using pesticides follows label and labeling instructions.</b></i>		<b>Label and labeling instructions not always followed.<sup>17</sup></b>		Evidence that labels are followed for environmental concerns.

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## Pest Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>3.15)</b> What management practices are used to prevent the development of pest resistance to certain pesticides?	Pesticides with different modes of action are rotated within a season or from one season to the next or used in tank mix where permitted. Pesticides at highest risk for resistance are not used when alternatives are available.	Some but not all pesticide modes of action are rotated or tank mixed. Pesticides at highest risk of resistance are used sparingly.	Pest resistance is not considered when selecting pesticides.		
<b>3.16)</b> Is a spill kit immediately available to pesticide applicators in the field?	<b><i>A spill kit</i></b> , containing a shovel, absorbent material, PPE and a container, <b><i>is immediately available.</i></b>		<b>No spill kit is available<sup>6</sup></b> or no plan is in place to contain spills.		Adequate spill kit present.
<b>3.17)</b> How is excess spray mixture disposed?	<b><i>Excess mixtures or rinsate is used at or below labeled rate of application.</i></b>		<b>Spray mixture dumped at farmstead or in nearby field or pond.<sup>4</sup></b>		Evidence that excess mixtures and rinsate properly managed.
<b>3.18)</b> How is the sprayer system rinsed?	<b><i>Sprayer system rinsed on pad or in field. Rinse water applied to labeled site at or below labeled rate of application.</i></b>		Sprayer rinsed out at farmstead. <b>Rinse water dumped at farmstead or in nearby field or pond.<sup>4</sup></b>		Satisfactory explanation of procedures for rinsingsprayer system.
<b>3.19)</b> How is the proper and safe operation of pesticide application equipment ensured?	<b><i>Equipment is correctly calibrated at least annually, and leaks are minimized to apply intended rate and distribution pattern.</i></b>		<b>Pesticide application equipment not properly calibrated.<sup>6</sup></b>		Date equipment calibrated annually.
<b>3.20)</b> How are pesticide applications assured to remain on-target and minimize off target pesticide spray drift?	<b><i>A written drift management plan is utilized that minimizes off target drift.</i></b>	Pesticide applications follow labeled instructions for target pests, but no drift management plan is utilized.	<b>Spraying operations are completed regardless of weather conditions or forecast, and regardless of potential for off-target drift.<sup>6</sup></b>		Written drift management plan on file.

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## Pest Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>3.21)</b> What pesticide application records are kept?	<i><b>Accurate records maintained of all agricultural crop applications of pesticides for at least three years.</b></i>	Partial pesticide records kept. Plan to maintain complete pesticide application records.	No record is kept. Chemicals used are known by memory or invoices only.		Pesticide records for the past 3 years on file (or plans to maintain records). <ul style="list-style-type: none"> <li>- Date of application.</li> <li>- Time of application.</li> <li>- Pesticide brand/product name.</li> <li>- Pesticide formulation.</li> <li>- EPA registration number.</li> <li>- Active ingredient(s).</li> <li>- Restricted-entry interval (REI).</li> <li>- Rate per acre or unit.</li> <li>- Crop, commodity, stored product or site that received the application.</li> <li>- Total amount of pesticide applied.</li> <li>- Size of area treated.</li> <li>- Applicator's name.</li> <li>- Applicator's certification number.</li> <li>- Location of the application.</li> <li>- Method of application.</li> <li>- Target pest.</li> <li>- Carrier volume per acre.</li> </ul>
<b>3.22)</b> How do you encourage beneficial insect populations?	Field borders and boundaries are managed to encourage beneficial insects. Pesticides are chosen to minimize damage to beneficial insects.		Beneficial insect management is not considered.		

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## Pest Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>3.23)</b> How are agriculture pollution emergencies handled?	Call 911, sheriff, fire or emergency services department for personal safety issues. <b>All uncontained spills or releases should be reported to the MDARD Agriculture Pollution Emergency Hotline: 1 800 405-0101</b> , or the MDEQ Pollution Emergency Alerting System: 1-800-292-4706.		<b>No contact to state or local authorities. Spill discharges directly to surface water.</b> <sup>4</sup>		Farm emergency plan on file, or local emergency telephone numbers immediately available.

## Irrigation Management Practices (If you do not use irrigation, skip this section.)

### System management

<b>4.01)</b> Have all irrigation systems been evaluated for application uniformity?	<b>All irrigation systems have been evaluated for uniformity.</b> Corrections are made to the system to improve uniformity.	Some irrigation systems have been evaluated for uniformity. Remainder of systems scheduled to be evaluated.	Irrigation system uniformity has not been evaluated.		Uniformity tests on file. Schedule for evaluating systems that have not been evaluated.
<b>4.02)</b> Are all sprinkler systems operated to minimize drift and off-target application?	<b>All sprinkler systems operated to minimize drift and off-target application.</b> No off-target irrigation application present.	Most sprinkler systems operated to minimize drift and offtarget application. Few offtarget irrigation applications occur.	Sprinkler systems often operated under windy conditions. Water sprayed over roads, adjacent property or structures.		No field evidence of off-target applications.
<b>4.03)</b> Is noise control provided when needed?	<b>Noise control provided</b> when needed.	In most areas of concern, noise control is provided when needed.	Noise control is not provided where needed.		

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## Irrigation Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>Record Keeping</b>					
<b>4.04)</b> Are proper irrigation system management records collected and retained for use in decision making and for reference in case of complaints?	The following irrigation system management records are collected and retained: <ul style="list-style-type: none"> <li>- <b><i>Crop type and location</i></b></li> <li>- <b><i>Source of the water used</i></b></li> <li>- <b><i>Date, method and amount of each irrigation water application</i></b></li> <li>- <b><i>All system inspections and repairs that influence uniformity and leaks</i></b></li> <li>- <b><i>Calibration of fertigation and chemigation equipment if used</i></b></li> <li>- <b><i>Records on system uniformity evaluation</i></b></li> </ul>	Most of irrigation system management records are collected and retained. Plan to maintain complete irrigation records.	Few or no irrigation system management records are collected and retained.		Irrigation records on file, or plans to maintain.
<b>Irrigation Scheduling</b>					
<b>4.05)</b> How is irrigation scheduling used to determine when it is necessary to irrigate and how much water should be applied during each irrigation event?	Irrigation water is scheduled on the basis of: <ul style="list-style-type: none"> <li>- <b><i>Available soil water for each unit scheduled.</i></b></li> <li>- <b><i>Depth of rooting for each crop irrigated.</i></b></li> <li>- <b><i>Container capacity for container-grown nursery crops.</i></b></li> <li>- <b><i>Allowable soil moisture depletion at each stage of crop growth.</i></b></li> <li>- <b><i>Measured, estimated or published.</i></b></li> <li>- <b><i>Evapotranspiration data to determine crop water use.</i></b></li> <li>- <b><i>Measured rainfall in each field irrigated.</i></b></li> </ul>	Irrigation water is scheduled on the basis of observed soil moisture content and/or daily water crop usage.	Irrigation water is applied at a set rate per week if no precipitation is received.		Scheduling system evident by records.

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## Irrigation Management Practices (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>4.06)</b> Is there a rain gauge in every irrigated field?	<i>Every field being managed for irrigation has a rain gauge in the field.</i>	Most fields have a rain gauge; plan to have gauges in all fields.	No rain gauges.		Rain gauges in all irrigated fields, or plan to maintain in all fields.
<b>Application Practices to Avoid Runoff and Leaching</b>					
<b>4.07)</b> Are irrigation water runoff and ponding minimized?	<i>Sprinkler application rates are below the soil infiltration rate.</i> Nutrient leaching is minimized.	Most sprinkler application rates are below the soil infiltration rate. Some runoff and/or ponding is present.	Sprinkler application rates exceed the soil infiltration rate. Runoff and/or ponding is commonly visible.		No indication of significant runoff or ponding in irrigated fields.
<b>4.08)</b> Are backflow prevention devices in place and properly maintained if fertigation or chemigation are used?	<i>Appropriate backflow prevention safety devices are used</i> and properly maintained if fertigation or chemigation is used.	Backflow prevention devices are almost always used and/or properly maintained.	Backflow prevention devices are not used and/or properly maintained.		Operational backflow devices field confirmed.
<b>4.09)</b> Is excess irrigation avoided?	<i>Irrigation water applications in excess of the quantity of water needed to replace the soil/substrate moisture deficit are avoided.</i>	Excess irrigation water applications may occur occasionally.	Excess irrigation water applications are common.		
<b>Wellhead Protection</b>					
<b>4.10)</b> Is the irrigation well adequately protected from contamination from pesticides and fertilizers?	<i>Anti-backflow device is installed,</i> and agricultural chemical/fertilizer storage and preparation areas are at least 150 feet from the well.	<i>Anti-backflow device is installed,</i> agricultural chemical/fertilizer storage and preparation areas have secondary containment, but <b>storage and preparation area is less than 150 feet from the well.</b> <sup>1</sup>	<b>No anti-backflow device, no secondary containment and less than 150 feet isolation distance from irrigation well.</b> <sup>1</sup>		Isolation distances field confirmed.

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## Water Use

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>5.01)</b> If the ground-water and surface water pumps have a combined capacity to pump more than 100,000 gallons per day (70 gallons per minute) for agricultural purposes, have you registered and reported water use to the State of Michigan?	Pump capacity is less than 100,000 gallons per day (70 gallons per minute). Or, Register and report annual water use to Michigan Department of Agriculture and Rural Development.		<b>Pump capacity is greater than 100,000 gallons per day (70 gallons per minute) and water use is not reported to the State of Michigan.<sup>13</sup></b>		Records indicate compliance.
<b>5.02)</b> Is there an unused well located in the cropping area?	No unused well, or abandoned well properly sealed.		<b>Unused, unsealed well in cropping area.<sup>1</sup></b>		Unused well(s) properly sealed.
<b>5.03)</b> Have you registered new or increased large quantity water withdrawals (capacity greater than 70 gpm or 100,000 gallons per day) for systems established after Feb. 28, 2006?	Yes.		<b>No.<sup>13</sup></b>		

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# Nursery Container Management (If you do not have containers, skip this section.)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>Irrigation</b>					
<b>6.01)</b> What happens to runoff in areas with containers?	Runoff is collected, filtered and/or treated and reused.	Runoff does not pond and does not enter surface water.	Runoff is not collected and <b>directly discharges to surface water.</b> <sup>4</sup>		No evidence of runoff or erosion.
<b>6.02)</b> Are runoff storage areas sized adequately?	Runoff collection areas can store an average rain event.	Runoff collection areas can not store an average rain event but do not regularly flood into surface water.	Runoff collection areas overflow regularly and runoff enters surface water.		
<b>6.03)</b> What type of irrigation is used?	Trickle irrigation with in-pot emitters.	Scheduled overhead irrigation based on crop or substrate monitoring.	Overhead irrigation applied at a set rate without regard to crop need.		
<b>Nutrients</b>					
<b>6.04)</b> What fertilizers do you use to minimize nutrient loss?	Controlled-release fertilizers or fertigation for in-pot emitters.		Quick-release fertilizers used exclusively. No split applications.		
<b>6.05)</b> Do you fertigate container stock with overhead sprinklers?	Overhead irrigation with fertigation is avoided on containers.		Overhead irrigation with fertigation is regularly used on containers.		
<b>Substrates</b>					
<b>6.06)</b> Is there regular testing of incoming new container media?	Each new load of container media is regularly tested to ensure that physical and chemical properties are correct.	Container media are often tested to ensure that physical and chemical properties are correct.	Container media are not tested.		
<b>6.07)</b> How are media and other organic wastes disposed of?	Used container media and organic wastes are composted. Leachate from compost is collected and properly disposed of.	Used container media and organic wastes are dumped on site and not composted. Leachate is not collected or properly disposed of.	Used container media and organic wastes are placed in trash or go to a landfill.		

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## Nursery Container Management (continued)

Risk question	Low risk – 3 (recommended)	Medium risk – 2 (potential hazard)	High risk – 1 (significant hazard)	Your risk	Records for MAEAP verification
<b>6.08)</b> Does the nursery conduct in-house pH and soluble salts testing of container-grown plants?	The nursery regularly does in-house pH and soluble salts testing of container-grown plants.	The nursery occasionally does in-house pH and soluble salts testing of container-grown plants.	The nursery does not do in-house pH and soluble salts testing of container-grown plants.		
<b>Site</b>					
<b>6.09)</b> Is the site designed to minimize runoff?	Site is graded to minimize runoff. Drainage areas collect additional runoff for reuse as irrigation. Impervious surfaces are minimized or drain to collection areas.	Some slopes on site. Impervious surfaces and fields drain toward buffer strips or runoff collection areas.	Site has extensive sloping. No collection areas for runoff. Extensive impervious areas that drain toward surface water.		
<b>6.10)</b> How are old and unused plant containers and trays disposed?	Containers are recycled or reused appropriately.	Containers are disposed of at a licensed landfill or stored on site.	<b>Empty and partially filled containers burned<sup>8</sup></b> or disposed of on site.		Evidence that containers are being managed properly.
<b>6.11)</b> How is used poly from overwintering houses disposed?	Poly is recycled through a recycling company or offered to others for reuse.	Poly is disposed of in a licensed land fill or stored on site.	<b>Poly is burned on site.<sup>8</sup></b>		Evidence of system for recycling or proper disposal of used poly.

## Other Environmental Risks in the Cropping System

<b>7.01)</b> Are there other activities, products, processes/equipment, services, byproducts and/or wastes in the cropping areas that pose contamination risks to groundwater or surface water?	No risk(s) identified.	Risk(s) identified and plan to mitigate the contamination risk(s).	No plan to mitigate contamination risk(s).		No other environmental risks found at farmstead.
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## Nursery and Christmas Tree System Improvement Action Plan

Develop your Nursery and Christmas Tree System Improvement Action Plan for risks beginning on the inside cover of this bulletin. Once you have implemented your plan, you can request MAEAP verification of your Cropping System.

**Table 1. Federal, state and local environmental requirements for operation of this nursery or farm business.**

This table contains the typical requirements for a farm business. There may be additional environmental requirements because of the type of operation and location. Contact the local or state permitting agencies for further information: MDEQ Environmental Assistance Hotline — 1-800-622-9278, and MDARD Information — 1-800-292-3939.

Environmental regulatory requirements	Description	Frequency	Administering Agency	Your expiration date
Private pesticide applicator certification	Any persons using or supervising the use of restricted-use pesticides (RUP) in the production of an agricultural commodity on their own or their employer's land must be certified pesticide applicators.	3 years	MDARD/Pesticide and Plant Pest Management Division (PPPM)	
Pesticide safety training for pesticide workers	The federal Worker Protection Standard for agricultural pesticides requires employers of pesticide handlers and workers to train employees on pesticide safety. Agricultural employers must be able to verify compliance.	Each employee must be trained every 5 years	MDARD/PPPM	
Farm motor vehicle fuel storage tanks greater than 1,100-gallon capacity (above and belowground tanks).	Fuel storage tanks have to be certified (aboveground) or registered (underground); a site plan has to have been submitted to the DEQ before the installation is placed into service. Smaller tanks have other requirements to be met.	Annual	MDEQ/Waste and Hazardous Materials Division	
Air use permit	Permit to install and operate equipment or processes that may emit air contaminants (incinerators for burning animal carcasses or manure, and biodigesters and associated equipment are examples).	Before construction	MDEQ/Air Quality Division	N.A.
Groundwater discharge permit	Any discharge of waste or waste effluent into or onto the ground (e.g., egg wash water and milk cooling water [over 10,000 gallons/day] that is discharged) and any livestock facility over 5,000 animal units.	5 years	MDEQ/Water Bureau	
Water withdrawal assessment (to avoid causing an adverse resource impact)	The water withdrawal assessment tool is intended for use before installing a new or increased large quantity withdrawal for the purpose of determining the potential impact to nearby water resources. As of February 28, 2006, all new withdrawals are prohibited from causing an adverse resource impact to the waters of the state. Beginning July 9, 2009, use of the water withdrawal assessment tool or request for a site-specific review will be required of all new withdrawals before installation. A large quantity withdrawal equals 100,000 gallons/day (70 gallons/minute) for 30 days.	Prior to new or increased large quantity water withdrawal.	MDEQ	

**Table 1. Federal, state and local environmental requirements for operation of this nursery or farm business (continued).**

Environmental regulatory requirements	Description	Frequency	Administering Agency	Your expiration date
New or increased large quantity water withdrawal	Any producer with the <i>capacity</i> to make a new or increased large quantity water withdrawal must register with the Michigan Department of Agriculture <i>before</i> beginning the withdrawal. A large quantity withdrawal equals 100,000 gallons/day (70 gallons/minute) for 30 days.	Once, before water withdrawal.	MDARD	The withdrawal capacity must be installed within 18 months or the registration becomes void.
Well permit	A person who installs a well, pump or pumping equipment shall comply with applicable laws, regulations, ordinances and codes.	Before construction	Local health department	N.A.
Septic permit (house and farm operations)	The first step in the process of determining if a piece of land that does not have municipal wastewater services available can be considered for an on-site septic system.	Before construction	Local health department	N.A.
Land and water interface construction permits	Construction activities (dredging, filling, draining, construction, structure placement) in, across or under water.	Before construction	MDEQ/Land and Water Management Division	N.A.
Soil erosion and sedimentation control permit	Earth change activities within 500 feet of a lake or a stream, or such activities that will disturb an area greater than 1 acre in size.	Before construction	County soil erosion permitting agency	
Water use reporting	Agricultural water users with the capacity to withdraw surface or groundwater that exceeds 100,000 gallons per day (70 gallons/minute) are required to report actual water withdrawals annually.	Annual	MDARD	

**Table 1. Federal, state and local environmental requirements for operation of this nursery or farm business (continued).**

Other environmental guidelines	Description	Administering Agency
Manure management	The Michigan Right-to-Farm Act (Act 93 of 1981) requires the establishment of generally accepted agricultural and management practices (GAAMPs). Agricultural producers who voluntarily follow these practices are provided protection from public or private nuisance litigation. The GAAMPs are reviewed annually. The latest GAAMPs can be accessed at: <a href="http://www.michigan.gov/mda">www.michigan.gov/mda</a> .	MDARD
Pesticide utilization and pest control		
Nutrient utilization		
Site selection and odor control for new and expanding livestock production facilities		
Irrigation water use		
MAEAP verification: Livestock, Farmstead and Cropping Systems	MAEAP systems verification is valid (P.A. 1 & 2, 2011) for 3 years. MAEAP verification in good standing is dependent on following the practices specific to each system, being in conformance with the applicable GAAMPs, an annual plan review and update (livestock system), and updates as necessary as conditions change on the farm.	MDARD

**Table 2. Legal citations for environmental risks in Crop\*A\*Syst for Nursery Crop and Christmas Tree Producers**

Footnote	Michigan Law	Description
1	Public Health Code, Public Act 368 of 1978	Part 127: Water Supply and Sewer Systems
4	Natural Resources and Environmental Protection Act, Act 451 of 1994	Part 31: Water Resources Protection
6		Part 83: Pesticide Control
8		Part 115: Solid Waste Management
9	Insect Pest and Plant Disease Act, Act 189 of 1931	
13		Part 327: Great Lakes Preservation
	<b>Federal Law</b>	
17	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)	
19	Worker Protection Standard for Agricultural Pesticides	



## Nursery Crop and Christmas Tree System Improvement Action Plan (continued)

Risk question	List high-risk practice(s) from Crop*A*Syst and medium-risk practices that do not meet MAEAP requirements	Required for MAEAP verification?	Management practice to reduce risk (include potential sources of technical and financial assistance)	Action plan	
				Planned completion date	Indicate date when completed

<b>MAEAP Verification Action Plan</b>	Date
Target date for MAEAP verification of <b>Cropping System</b>	
Target date for MAEAP verification of <b>Farmstead System</b>	
Target date for MAEAP verification of <b>Livestock System</b>	

*For MAEAP verification, contact MAEAP office at the Michigan Department of Agriculture and Rural Development: 517-373-9797.*