

CROP•A•SYST

FOR NURSERY CROP AND CHRISTMAS TREE PRODUCERS

FAS 114 · October 2019



**For MAEAP Verification:
Contact the MAEAP Office at the
Michigan Department of Agriculture
& Rural Development**

(517) 284-5609



MICHIGAN STATE UNIVERSITY | Extension

Crop♦A♦Syst

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

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 _____

Crop♦A♦Syst conducted by:

Name _____ Title _____

Organization _____ Date _____

MAEAP Verification Action Plan	Date
Target date for MAEAP verification of Cropping System	
Target date for MAEAP verification of Farmstead System	
Target date for MAEAP verification of Livestock System	
Target date for MAEAP verification of Forest, Wetlands, and Habitat System	

Introduction

Crop♦A♦Syst for Nursery Crop and Christmas Tree Producers will assist growers in developing and implementing a management plan that prevents contamination of groundwater and surface water resources and maintains economic crop production. Plans will be consistent with applicable Michigan Right to Farm Generally Accepted Agricultural and Management Practices (GAAMPs) 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 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 current pest management practices and identify alternative

management practices that, when implemented, will reduce negative impacts to the environment.

The Michigan Agriculture Environmental Assurance Program (MAEAP) 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 on-farm risk evaluation uses specific tools for each system. Environmentally assured farms are eligible for various incentives and recognitions.

The Michigan Right to Farm Act authorizes the Michigan Commission of Agriculture and Rural Development to develop and adopt GAAMPs for farms and farm operations in Michigan. These voluntary practices are based on available technology and scientific research to promote sound environmental stewardship. The current Right to Farm GAAMPs are posted on the Michigan Department of Agriculture and Rural Development (MDARD) Web site: www.michigan.gov/mdard.

Producers who complete the Crop♦A♦Syst for Nursery Crop and Christmas Tree Production will be able to determine what management and record-keeping changes (if any) will be needed for their Cropping System to be environmentally assured through MAEAP. Once a producer develops and implements a Nursery Crop and Christmas Tree System Improvement Action Plan to address the risks indicated by the Crop♦A♦Syst assessment, he or she can contact the Michigan Department of Agriculture and Rural Development (MDARD) at (517) 284-5609 to request a MAEAP Cropping System verification inspection.

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 provided to MDARD for verification. Any information connected with the development, implementation or verification of a conservation plan or conservation practice is confidential.

The owner of a MAEAP verified Cropping System will be eligible for various incentives and can enjoy the peace of mind that comes from knowing that Cropping System practices are consistent with the identified current Right to Farm GAAMPs. Verified Cropping Systems are positioned to achieve regulatory compliance with state and federal environmental laws.

Similar incentives are available for producers who have environmentally assured their Livestock and Farmstead Systems. Contact a local conservation district, MSU Extension or Natural Resources Conservation Service (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 assess how effectively crop management practices protect groundwater and surface water resources. The risk questions are grouped in the following sections:

Crop♦A♦Syst

	Nursery Crop and Christmas Tree System Improvement Action Plan
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
7	Other Environmental Risks in the Cropping System

Each risk question assesses the impact of 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 GAAMPs indicate a management practice consistent with a specific GAAMPs 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 GAAMPs and environmentally based agronomic management practices are supported by research. The records or evidence 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. Agricultural representatives (both public and private) can assist growers 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 the farm or nursery.
- 2) Answer the risk questions by selecting the answer that best describes management practices used on the farm. Indicate the risk level in the column to the right. Skip any questions that don't apply.

Note: for MAEAP verification, complete the risk questions with a Crop♦A♦Syst trained individual. A MAEAP 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 Plan, list:
 - Management practice(s) that are planned for implementation that will reduce the identified risk.
 - Sources of technical assistance.
 - Target dates for accomplishing the changes.
 - Target date for MAEAP Cropping System verification.

A Few Final Words

The key to Crop♦A♦Syst is that once environmental risks are identified, the plan is implemented 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.

After a plan is developed and changes are implemented to address the risks, the farm is ready for MAEAP Cropping System verification.

Nutrient Management Practices

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
1.00) Has there ever been a formal Right to Farm complaint against the farm?	There has never been a Right to Farm complaint, or the concern was not verified, or the concern was resolved.		There was a formal Right to Farm complaint and the concern was not resolved.	Producer's verbal indication of complaint history.	
1.01) How often are fields tested for nutrient levels (P, K, Ca, Mg and pH)?	<i>All fields are sampled and tested on a regular basis</i> , 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.	
1.02) 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. One composite sample taken from areas greater than 40 acres.	Soil types/soil maps demonstrating uniformity. Cropping histories. Proper soil sampling procedure.	
1.03) Is the soil pH maintained in the desirable range for the crop(s) being grown?	The soil pH maintained in the desirable range to enhance nutrient availability.		The soil pH is not monitored or maintained in the desirable range.		
1.04) How are all sources of nutrients considered when making fertilization decisions?	<i>Credit taken for nutrients supplied by organic matter, legumes and manure or other biological materials</i> (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.	
1.05) How are fertilizer application rates determined?	<i>Consistent with Michigan State University</i> (MSU) recommendations. 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.	

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

Bold Black print indicates a violation of state or federal regulation.

Bold Blue Italic print indicates a management practice consistent with 2019 Right to Farm (RTF) Generally Accepted Agricultural Management Practices (GAAMPs).

Nutrient Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
1.06) How are nutrient management plans for each field annually developed and followed?	Annual nutrient plan is developed for each field that 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.	
1.07) Is fertilizer application equipment checked for proper adjustment?	<i>Application equipment checked</i> annually <i>for rate of application and placement.</i> Over and under applications monitored and corrected.		Application equipment not checked.	Name of person responsible for fertilizer applicator adjustments and the dates of adjustments.	
1.08) What soil nutrient management records are kept?	<i>Records of soil test reports and quantities of nutrients applied to individual fields are maintained.</i> Also, crop performance 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.	Three years of records, or five years if applying manure, or plans to begin keeping records. -Soil fertility tests and/or plant analysis results. -Previous crop grown and yield harvested. -Date(s) of application(s). -Nutrient composition of fertilizer or other material used. -Amount of nutrient-supplying material applied per acre. -Method of application and placement of applied nutrients. -Vegetative growth and cropping history of perennial crops.	

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Nutrient Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
<p>1.09) 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?</p>	<p>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.</p>		<p>Fertilizer and pesticide (including treated seed) supply vehicle is left in an unsecured location or fertilizer and pesticides stored less than 150 feet from any well.¹</p>	<p>Map showing areas adjacent to wells where vehicles should not be parked. No evidence of vehicles left in an unsecured location.</p>	
<p>1.10) How is manure and/or compost temporarily stockpiled in relation to surface water?</p>	<p><i>Manure</i> and/or compost <i>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.</i></p>		<p>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 runoff and erosion losses to surface waters.⁴</p>	<p>Acceptable temporary manure and/or compost storage demonstrated. Adequate isolation from surface water.</p>	
<p>1.11) For temporarily stacked manure, and/or compost, how is the site managed to protect surface water, groundwater, and/or neighboring properties?</p>	<p><i>Manure</i>, and/or compost, <i>is managed in a manner to prevent runoff and/or leaching of nutrients to surface water or groundwater and to minimize odor impacts upon neighbors.</i> 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.</p>	<p>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.</p>	<p>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. Runoff and/or leachate discharge directly to surface water.⁴</p>	<p>Appropriate temporary manure, and/or compost, storage demonstrated. Adequate isolation from surface water.</p>	

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Nutrient Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
1.12) 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>		Manure stockpiled for more than six months without a cover, or more than twelve months with an impermeable cover.	Manure and/or compost not stockpiled for more than 365 days.	
1.13) Is clean water (i.e. roof and surface runoff) diverted away from the manure and/or compost storage facility?	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 discharges directly to surface water. ⁴	Visual inspection of storage site(s).	
NITROGEN MANAGEMENT PRACTICES					
1.14) How are nitrogen (N) fertilizer applications matched 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.		
FIELD PHOSPHORUS MANAGEMENT PRACTICES					
1.15) How are phosphorus (P) fertilization rates determined?	<i>Based on soil tests or plant tissue analysis using Michigan State University or equivalent recommended rates.</i>	P fertilization based on past practices, without regard to soil test P levels.	P fertilization based on applying as much as is affordable.	P management consistent with Nutrient Management GAAMPs.	
1.16) Where is the phosphorus (P) 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.		

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Nutrient Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
FIELD PHOSPHORUS MANAGEMENT PRACTICES (CONTINUED)					
1.17) How often is commercial Phosphorus (P) fertilizer applied on frozen or snow covered fields?	P fertilizer is never broadcast on frozen or snow-covered fields.	<i>Broadcast applications avoided on frozen or snow-covered fields</i> and are not part of the nutrient management plan.	P fertilizer is often broadcast on frozen or snow-covered fields.	Date(s) of application(s) of P fertilizers.	
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.18) What manure management records are maintained?	Complete application <i>records of manure analysis, soil test results and rates of manure application for individual fields are maintained.</i>	A minimum of one season of manure application records, or partial application records have been kept. Complete manure application records will be kept immediately and will be available for review at the time of re-verification.	Minimal or no records maintained.	Additional records that are needed if manure is used in the nursery cropping system: -Date(s) of manure/wastewater application(s) (calendar) -Source, rate, and form of manure/wastewater applied -Date, rate(s), and form of other nutrients applied -Date(s) of incorporation -Method of application (e.g., surface-applied, injected, irrigated) -Acres and area of field nutrients applied -Weather and field conditions during application of manure (e.g., sunny, 70°F) -Recommended nutrient application rates -Previous crops grown and yields -Plant tissue sampling and testing reports (where applicable) -Complete N, P, K nutrient budget by field -Manure/wastewater quantities produced and nutrient analysis results -Inspection and maintenance records -Records of rental agreements or other agreements for application of manure/wastewater on land not owned by the producer -Record of manure/wastewater sold or given away to other landowners	

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Nutrient Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.19) How is the nutrient content of manure determined?	<i>Laboratory analysis for percent dry matter (solids), ammonium, and total N, P and K.</i>	Book values or standard nutrient content values used.	Manure nutrient content is unknown.	All manure analyses or book values on file.	
1.20) 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.	
1.21) How is manure, and/or compost, generally applied to fields?	<i>Manure, and/or compost, is incorporated within 48 hours or injected into the soil, and/or conservation practices (residue management, cover crops, perennial crops etc.) are used to protect against runoff and erosion losses to surface waters.</i>	Manure, and/or compost, is generally surface-applied, and conservation practices are employed to reduce the risk of runoff.	Manure, and/or compost, is applied in a manner that results in ponding, soil erosion losses, or manure runoff to adjacent property, drainage ditches, or discharges directly to surface water. ⁴	Fields that receive manure, and/or compost, applications are properly managed.	
1.22) How are streams, wetlands, farm ditches and other water bodies protected from manure runoff?	<i>Manure is incorporated within 48 hours or injected. Or, surface applications are not done within 150 feet of surface water.</i> Or, filter strips, riparian buffer strips, and other conservation practices are maintained between fields and surface waters on the farm and around surface water inlets.	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.	
1.23) How are manure phosphorus application rates managed?	<i>If Bray P1 reaches 150 ppm, manure applications 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)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.24) How are fields selected for manure spreading on frozen and snow-covered ground?	No applications on frozen or snow-covered ground without injection or incorporation.	Manure application risks index (MARI) has been completed for each field receiving manure on frozen or snow-covered ground. Frozen or snow-covered fields receiving manure have met MARI criteria for Low or Very Low rating and <i>no liquid manure is applied on slopes greater than 3%, and no solid manure is applied to slopes over 6%.</i>	Applications are made to fields where runoff to water resources may occur.	Completed MARI for each field receiving winter manure application, or spreading plan that does not include winter spreading.	
1.25) How are field tiles managed to prevent manure discharge to surface water?	<i>Liquid manure is prevented from reaching tile lines.</i> 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).	
1.26) 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.		
BIOSOLIDS MANAGEMENT PRACTICES (If biosolids are not used, skip this section.)					
1.27) 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 ₄ -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)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
BIOSOLIDS MANAGEMENT PRACTICES (IF BIOSOLIDS ARE NOT USED, SKIP THIS SECTION)					
1.28) 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

2.01) Have environmentally sensitive areas been identified (land near surface water, highly erodible soils, 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. Family members, employees and contractors are aware of and understand the management practices to protect these areas.	Some environmentally sensitive areas are identified.	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"> -Next to surface waters. -Fields with shallow groundwater. -Fields with water wells. -Areas near surface water inlets. -Fields with highly erodible soils. -Fields with highly leachable soils. -Surface drains. -Fields with high runoff potential. <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)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
2.02) 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 farm.	RUSLE2 and WEPS calculations completed for worst-case fields on the basis of soils, slopes, rotation, etc.	
2.03) Are all streams, wetlands, farm ditches, and other bodies of water in the nursery protected 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 are maintained on some fields.	No conservation practices are maintained. Nursery stock grown immediately next to surface waters, drainage ditches and roads.		
2.04) Are cover crops planted 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 soil and water resources and control erosion.	Cover crops are used occasionally.	Cover crops are 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)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
2.05) 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.		
2.06) 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

3.01) 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 107: Section 3, Pesticide Storage and Handling.	Appropriate pesticide storage demonstrated.	
3.02) How does the grower stay current on new pest management practices and strategies for weeds, insects and diseases?	Attends educational meetings, reads educational materials provided by the university or other reliable sources. Adopts at least one new pest management practices adopted on a trial basis each year.	Occasionally attends educational meetings and read new pest management materials.	Relies on outdated pest management practices.		
3.03) Does the grower consult with a pest management consultant or service during the growing season?	Employs and independent crop consultant throughout the growing season that is knowledgeable of Integrated Pest Management (IPM) OR, Utilizes public reports and services from the university, local agribusiness or other reliable providers.		Relies on outdated pest management practices.		

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Pest Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
PEST PREVENTION AND AVOIDANCE					
3.04) Does the grower review previous growing season pest management activities and results?	Previous pest populations, pest suppression activities/pesticide usage and crop yield/injury are reviewed. Records used for future pest management plans.	No.			
3.05) When available, are certified seed or plant materials (tubers, crowns, transplants, etc.) used that are insect, weed and disease-free?	Certified or quality seed and planting materials used whenever possible.	Bin-run or uncertified planting material that is cleaned and treated.	Use saved seed or planting materials that is untreated and potentially infected with insects, weed and/or disease pests.		
3.06) Are pest resistant and tolerant varieties planted?	Pest resistant and tolerant varieties are planted when available.	Varieties without resistance and tolerance are planted, resulting in the need for pest suppression practices.			
MONITORING					
3.07) Are fields scouted for pests during the growing season?	All fields are scouted on a weekly schedule, by a qualified individual trained in IPM. Scouting reports and records are filed.	Fields are scouted at critical times, but not on a weekly basis.	Fields are not scouted.		
3.08) Are weather conditions relevant to pest management monitored? (i.e. air and soil temperature, precipitation, soil moisture, wind speed and direction, leave wetness, etc.)	On-farm weather station(s) provide data to assist with crop and pest management decisions. OR, MSU Enviro-weather (www.enviroweather.msu.edu) or other weather-based models are used to assist with crop and pest management decisions.	Consumer weather information used for crop and pest management decisions.	Weather conditions are not considered when making crop and pest management decisions.		

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Pest Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
MONITORING (CONTINUED)					
3.09) Does the farm or nursery comply with all Michigan Department of Agriculture and Rural Development (MDARD) nursery inspection requirements?	Farm or nursery works to comply with all MDARD nursery inspection requirements.		Nursery does not work to comply with all MDARD nursery inspection requirements. ¹⁵		
PESTICIDE APPLICATION					
3.10) Are soil characteristics and field conditions considered 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.		
3.11) 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.		Labeled directions are not followed. ¹⁷ Spray 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.	
3.12) 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.		
3.13) Are the purchasers and applicators of Restricted Use Pesticides (RUP) certified applicators?	<i>The purchaser and applicator of RUP comply with the certification requirements.</i>		Non-certified and unsupervised applicators use RUP. ⁶	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)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.14) How are workers and pesticide handlers protected from exposure to pesticides?	<i>Workers and handlers: -Follow specific label requirements. -Are provided decontamination supplies. -Are trained or certified applicators. -Are informed of pesticide applications. -Are provided personal protective equipment. -Are provided emergency assistance, if needed.</i>		Worker Protection Standard requirements are partially met or ignored. ¹⁹	Complete list of worker protection standards can be found at: www.epa.gov/pesticides/health/worker.htm .	
3.15) 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.	
3.16) How are empty pesticide containers rinsed and disposed?	<i>Containers are triple rinsed or power rinsed, punctured and returned to dealer, recycled, or taken to licensed landfill. Bags are returned to dealer or taken to licensed landfill. Properly rinsed containers can be disposed of in a dumpster that is taken to a licensed landfill.</i>	Disposal of empty containers and bags on the farm or nursery property. ^{8,17}	Disposal of partially filled containers. Burning of container on the farm or nursery property. ^{8,17}	Evidence of containers being recycled or proper disposal.	
3.17) Do pesticide applicators read and follow the label instructions?	<i>Everyone using pesticides follows label and labeling instructions.</i>		Label and labeling instructions not always followed. ¹⁷	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)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.18) 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 mixes where permitted. Pesticides at highest risk of 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. Refuge requirements for transgenic seed are ignored.		
3.19) Is a spill kit immediately available to pesticide applicators in the field?	<i>A spill kit</i> , containing a shovel, absorbent material, PPE, and a container <i>is immediately available</i> .		No spill kit is available ⁶ or no plan is in place to contain spills.	Adequate spill kit present.	
3.20) How is excess spray mixture or rinse water from the interior of the spray system disposed?	<i>Spray mixture is applied to labeled site at or below labeled rate of application</i> or appropriately stored for later use.		Spray mixture dumped at farmstead or in nearby field or pond. ⁴	Evidence that excess mixtures and rinsates are properly managed.	
3.21) Where is the exterior of the spray equipment and tractor washed if there is accumulated residue?	Washed in containment or washed in the field in different locations >200' from surface water, catch basins or tile inlets and >150' from a well.		Washed in the same location without collection, or in the field <200' from the surface water, catch basins or tile inlets or <150' from a well.	Satisfactory explanation of procedures for washing spray equipment.	
3.22) How is accumulated spray building wastewater or other comingled rinsates that cannot be directly applied to growing crops disposed?	Applied to a site where there is growing vegetation or where a crop will be planted following labeled setbacks at or below labeled rates. Application areas are rotated and records of contents of material and application site are kept. Or taken to a hazardous waste landfill.		Dumped at the farmstead, in the field or a direct discharge to surface water. ⁴	Records of application are provided.	

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Pest Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.23) How is the proper and safe operation of pesticide application equipment ensured?	<i>Equipment is correctly calibrated at least annually and leaks minimized to apply intended rate and distribution pattern.</i>		Pesticide application equipment not properly calibrated.⁶	Date equipment calibrated annually.	
3.24) How are pesticide applications assured to remain on-target and minimize off target pesticide spray drift?	<i>A written drift management plan is utilized that minimizes off target drift.</i>	Pesticide applications follow labeled instructions for target pests, but no drift management plan is utilized.	Spraying operations are completed regardless of weather conditions or forecast, and regardless of potential for off-target drift.⁶	Written drift management plan on file.	
3.25) What pesticide application records are kept?	<i>Accurate records maintained of all agricultural crop applications of pesticides for at least three years.</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 three years on file (or plans to maintain records). <ul style="list-style-type: none"> - Date of application - Time of application - Pesticide brand/product name - Pesticide formulation - EPA registration number - Active ingredient(s) - Restricted-entry interval - Rate per acre or unit - Crop, commodity, stored product, or site that received the application - Total amount of pesticide applied - Size of area treated - Applicator's name - Applicator's certification number - Location of the application - Method of application - Target pest - Carrier volume/acre 	

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Pest Management Practices (continued)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.26) Are areas of the nursery set aside as habitat for pollinators?	At least two acres are devoted to conservation of native bees and other pollinators by providing flowers through the season, and this is planted with a specific mix of wildflowers for this purpose.	Some areas of the nursery are set aside to provide flowers for bees and other pollinators.	No habitat is provided for pollinators.	Note: Cost share is available through enrollment in the USDA pollinator conservation programs (e.g., USDA's FSA CRP-SAFE pollinator program).	
3.27) How are beneficial insect populations encouraged?	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.			
3.28) If a soil fumigant pesticide is used on the farm, is a fumigation management plan (FMP) utilized?	A written, site-specific fumigation management plan that meets US EPA requirements is prepared and utilized before fumigation begins?		A FMP is not prepared. ¹⁷		
3.29) How are agriculture pollution emergencies handled?	Call 911, sheriff, fire or emergency services department for personal safety issues. <i>All uncontained spills or releases should be reported to the MDARD Agriculture Pollution Emergency Hotline: 1-800-405-0101, or the MDEGLE Pollution Emergency Alerting System: 1-800-292-4706.</i>		No contact to state or local authorities. Spill discharges directly to surface water. ⁴	Farm emergency plan on file, or local emergency telephone numbers immediately available.	

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Irrigation Management Practices (If Irrigation is not used, skip this section.)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
SYSTEM MANAGEMENT					
4.01) Have all irrigation systems been evaluated for application uniformity?	<i>All irrigation systems have been evaluated for uniformity.</i> 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.	
4.02) How is the amount of irrigation water delivered accurately determined.	<i>All water applications are accurately determined –</i> -by knowing actual flow delivered (GPM) and time of application. -or, by using a flow meter -or, by average output caught with system evaluation.	Water applications are estimated or based on rates given by irrigation vendor or installation company.	Water application amounts not determined. Excess application occurs.	Irrigation water delivered by irrigation is accurately determined.	
4.03) Are all sprinkler systems operated to minimize drift and off-target application?	<i>All sprinkler systems operated to minimize drift and off-target application.</i> No off- target irrigation application present.	Most sprinkler systems operated to minimize drift and off-target application. Few off-target 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.	
4.04) Is noise control provided when needed?	<i>Noise control provided</i> when needed.	In most areas of concern, noise control is provided when needed.	Noise control is not provided where needed.		

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RECORD KEEPING					
<p>4.05) Are proper irrigation system management records collected and retained for use in decision-making and for reference in case of complaints?</p>	<p>The following irrigation system management records are collected and retained:</p> <ul style="list-style-type: none"> <i>-Crop type and location</i> <i>-Source of the water used</i> <i>-Date, method and amount of each irrigation water application</i> <i>-All system inspections and repairs that influence uniformity and leaks</i> <i>-Calibration of fertigation and chemigation equipment if used</i> <i>-Records on system uniformity evaluation</i> 	<p>Most of irrigation system management records are collected and retained. Plan to maintain complete irrigation records.</p>	<p>Few or no irrigation system management records are collected and retained.</p>	<p>Irrigation records on file, or plans to maintain.</p>	
IRRIGATION SCHEDULING					
<p>4.06) How is irrigation scheduling used to determine when it is necessary to irrigate and how much water should be applied during each irrigation event?</p>	<p>Irrigation water is scheduled on the basis of:</p> <ul style="list-style-type: none"> <i>-Available soil water for each unit scheduled</i> <i>-Depth of rooting for each crop irrigated</i> <i>- Container capacity for container-grown nursery crops</i> <i>-Allowable soil moisture depletion at each stage of crop growth</i> <i>-Measured, estimated, or published evapotranspiration data to determine crop water use</i> <i>-Measure rainfall in each field irrigated</i> 	<p>Irrigation water is scheduled on the basis of observed soil moisture content and/or daily water crop usage.</p>	<p>Irrigation water applied at a set rate per week if no precipitation is received, or amounts of water applied through irrigation are not adjusted for crop stages.</p>	<p>Scheduling system evident by records.</p>	

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IRRIGATION SCHEDULING (CONTINUED)					
4.07) Is there a rain gauge in every irrigated field?	<i>Every field being managed for irrigation has a rain gauge in the field. Rain events are observed and used in conjunction with irrigation scheduling.</i>	Most fields have a rain gauge; plan to have gauge in all fields.	No rain gauges or only one rain gauge at the farmstead.	Rain gauges in all irrigated fields, or plan to maintain in all fields.	
IRRIGATION PRACTICES TO AVOID RUNOFF AND LEACHING					
4.08) Is 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.	
4.09) How far is the fertilizer/ pesticide chemigation storage, or fertigation/chemigation system located from surface water (pond, streams, rivers, drains, etc.)?	<i>200 feet or greater.</i>	Less than 200 feet with appropriate security measures.	Less than 200 feet.	Appropriate chemigation storage, or fertigation/chemigation system isolation from surface water.	
4.10) 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.		

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Irrigation Management Practices (If Irrigation is not used, skip this section.)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
WELLHEAD PROTECTION					
4.11) Is the irrigation well adequately protected from contamination from pesticides and fertilizers when fertigation or chemigation is used?	<i>Anti-backflow device installed</i> , including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap and agricultural chemical/fertilizer storage and preparation areas are at least 150 feet from the well, or at least 50 feet from the well containment. Air gap is twice the diameter of the fill pipe or 6 inches, whichever is greater.	<i>Anti-backflow device installed</i> , including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap, agricultural chemical/fertilizer storage and preparation areas have secondary containment, but storage and preparation areas are less than 50 feet from the well. ¹ Air gap is twice the diameter of the fill pipe or 6 inches, whichever is greater.	No anti-backflow device, ¹ no secondary containment and less than 150 feet isolation distance from irrigation well. ¹	Isolation distances field confirmed.	
4.12) If the irrigation well is inter-connected with a surface water source, is the well protected from backflow (back pressure and back siphonage) from the surface water into the well?	<i>Anti-backflow device installed</i> , including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap that protects the well from back pressure and back siphonage into the well. Air gap is twice the diameter of the fill pipe or 6 inches, whichever is greater.		No anti-backflow device installed. ¹	Anti-backflow device installed, including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap.	

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Irrigation Management Practices (If Irrigation is not used, skip this section.)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
WELLHEAD PROTECTION (CONTINUED)					
4.13) How far is the irrigation fuel tank from a storm drain, surface water, or designated wetland?	Tank is more than 50 feet away or has some other engineering control present that would control or divert a spill from reaching a storm drain, surface water, or designated wetland.		Tank is 50 feet or less away from surface water¹⁵ and without an engineering control in place.	Appropriate fuel storage isolation distance from surface water.	
4.14) Is a horizontal sock well (HSW) present in the cropping system?	-HSW outlets are clearly identified as not being suitable for human consumption. -HSW is completely separated (no common piping) from any potable water supply system. -HSW meets isolation distance requirements the entire horizontal length of the HSW -Both ends of the HSW are identified.	-HSW outlets are clearly identified as not being suitable for human consumption. -HSW is completely separated (no common piping) from any potable water supply system. -HSW meets isolation distance requirements the entire horizontal length of the HSW, except for chemigation/fertigation systems during active use season that have <i>backflow prevention device installed</i> , including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap and secondary containment. -Both ends of the HSW are identified.	HSW is being used for human consumption, shares common piping with a potable water supply, does not have both ends clearly identified, or does not meet State of Michigan isolation distances or MAEAP standard for its entire horizontal length.^{1,3}	Low or medium risk criteria are present or demonstrated.	

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Water Use

RISK QUESTION	Low Risk – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
WATER USE REPORTING					
5.01 If the groundwater and surface water pumps have a combined capacity to pump more than 100,000 gallons per day (70 gallons per minute) for agricultural purposes, has water use been registered and reported 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 by April 1.		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.¹³	Records indicate compliance.	
5.02 Is there an unused well located in the cropping area?	No unused well, or abandoned well properly sealed.	Unused well temporarily abandoned properly. -Meets minimum isolation distances -Is disconnected from any water distribution piping. -Has the top of the casing securely capped.	Unused, unsealed well in cropping area.¹	Unused well(s) properly sealed.	
5.03 Have new or increased large quantity water withdrawals been registered (pumping capacity greater than 70 gallons per minute, or 100,000 gallons per day, for systems established after July 9, 2009)?	The Water Withdrawal Assessment Tool (WWAT) was used to determine if a proposed withdrawal or expansion is likely to cause an Adverse Resource Impact, and to register the water withdrawal with MDEGLE, prior to beginning the withdrawal. The WWAT and registration site is www.deq.state.mi.us/wwat		No, a new water withdrawal exceeding 70 gallons per minute has been established without the use of the WWAT.¹³	Producer's verbal indication of compliance with regulation.	

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Nursery Container Management (If containers are not used, skip this section.)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE OF MAEAP VERIFICATION	YOUR RISK
IRRIGATION					
6.01) 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 directly discharges to surface water. ⁴	No evidence of runoff or erosion.	
6.02) Are runoff storage areas sized adequately?	Runoff collection areas can store an average rain event.	Runoff collection areas cannot store an average rain event but do not regularly flood into surface water.	Runoff collection areas overflow regularly and runoff enters surface water.		
6.03) 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.		
NUTRIENTS					
6.04) What fertilizers are used to minimize nutrient loss?	Controlled-release fertilizers or fertigation for in-pot emitters.		Quick-release fertilizers used exclusively. No split applications.		
6.05) Is container stock fertigated with overhead sprinklers?	Overhead irrigation with fertigation is avoided on containers.		Overhead irrigation with fertigation is regularly used on containers.		
SUBSTRATES					
6.06) 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.		
6.07) How are unwanted media and other organic wastes disposed?	Media and organic wastes are separated from containers and composted or land applied. Compost pile stored in a location protected from leaching and runoff.		Media and organic wastes stored in an unprotected site. Nutrients can leach into the ground water or runoff into surface water. ⁴	Environmentally safe disposal demonstrated.	

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Nursery Container Management (If containers are not used, skip this section.)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
SUBSTRATES (CONTINUED)					
6.08) 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.		
SITE					
6.09) 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.		
6.10) How are old or unusable plant containers and trays disposed?	Containers are recycled or reused appropriately.	Containers are disposed at a licensed landfill or stored on site.	Empty and partially filled containers burned⁸ or disposed of on the farm.	Evidence that containers are being managed properly.	
6.11) 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.	Poly is burned on site.⁸	Evidence of system for recycling or proper disposal of used poly.	

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Other Environmental Risks in the Cropping System

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
OTHER ENVIRONMENTAL RISKS IN THE CROPPING SYSTEM					
7.01) Is a live, restricted, or prohibited species on the land or in the waters owned by producer?	Such species is not known to be present.	Such species is present, but was not knowingly introduced, It was introduced under a permit, OR It is possessed under a permit.	Such species is present because it was knowingly introduced without a permit, OR It is possessed without a permit. ¹⁴		
7.02) 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.	

Nursery Crop and Christmas Tree System Improvement Action Plan

Develop the Nursery Crop and Christmas Tree System Improvement Action Plan for risks beginning on the inside cover of this bulletin. Once the plan has been implemented, you can request MAEAP verification of your Cropping System. Please call the Michigan Department of Agriculture and Rural Development, MAEAP office at 517-284-5609.

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

Black print indicates a violation of state or federal regulation.

Blue print indicates a management practice consistent with 2019 Right to Farm (RTF) Generally Accepted Agricultural Management Practices (GAAMPs).

Table 1. Federal, state and local environmental requirements for operation of this 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: MDEGLE Environmental Assistance Hotline —1-800-662-9278, 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 LARA before the installation is placed into service. Smaller tanks have other requirements to be met.	Annual	Department of Licensing and Regulatory Affairs (LARA)	
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	MDEGLE/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	MDEGLE/Water Resources Division	
Water Withdrawal Assessment – new or increased large quantity withdrawal	The Water Withdrawal Assessment Tool (WWAT) is designed to estimate the likely impact of a water withdrawal on nearby streams and rivers. Use of the WWAT is required of anyone proposing to make a new or increased large quantity withdrawal (over 70 gallons per minute) from the waters of the state, including all groundwater and surface water sources, prior to beginning the withdrawal. The WWAT and registration site is www.deq.state.mi.us/wwat .	Before water withdrawal	MDEGLE/Water Resources Division	The registration is valid for 18 months.
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.

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

Environmental Regulatory Requirements	Description	Frequency	Administering Agency	Your Expiration Date
Land and water interface construction permits	Construction activities (dredging, filling, draining, construction, structure placement) in, across or under water.	Before construction	MDEGLE/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	
Identification guides for some species regulated by Part 413.	http://mnfi.anr.msu.edu/invasive-species/aquaticsfieldguide.pdf https://mnfi.anr.msu.edu/invasive-species/InvasivePlantsFieldGuide.pdf			
Environmental Guidelines	Description	Administering Agency	Your Expiration Date	
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: www.michigan.gov/mdard .	MDARD	N.A.	
Pesticide utilization and pest control				
Nutrient utilization				
Site selection and odor control for new and expanding livestock production facilities				
Irrigation water use				
Farm market				
MAEAP verification: Livestock, Farmstead, Cropping and Forest, Wetlands and Habitat Systems	MAEAP systems verification is valid (P.A. 1 & 2, 2011) for five years. MAEAP verification in good standing is dependent on following the practices specific to each system, being consistent 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 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
3	Safe Drinking Water Act, Public Act 399, of 1976	
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
13		Part 327: Great Lakes Preservation
14		Part 413: Wildlife Conservation
15	Insect Pest and Plant Disease Act, Act 189 of 1931	
16	Fire Prevention Code PA 207 of 1941	Storage and handling of Flammable and Combustible Liquids
	Federal Law	
17	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)	
19	Worker Protection Standard for Agricultural Pesticides	

BUSINESS NAME: _____
 BUSINESS OWNER NAME: _____
 BUSINESS PHONE: _____
 EXTENSION: _____
 BUSINESS WEB SITE: _____
 DESCRIPTION: _____

BUSINESS ADDRESS INFORMATION (Main Office or Home Address)

(MAILING) STREET: _____
 (MAILING) P.O. BOX: _____
 (MAILING) CITY: _____
 (MAILING) STATE: _____
 (MAILING) ZIP CODE: _____

OWNERS CONTACT INFORMATION

SALUTATION: (Circle one)
 MR or MRS or MS
 FIRST NAME: _____
 LAST NAME: _____
 CONTACT ROLE: _____
 EMAIL ADDRESS: _____

HOME PHONE NUMBER: _____-_____-_____
 MOBILE/CELL NUMBER: _____-_____-_____
 (MAILING) STREET: _____
 (MAILING) P.O. BOX: _____
 (MAILING) CITY: _____
 (MAILING) STATE: _____
 (MAILING) ZIP CODE: _____

FARM MANAGER CONTACT INFORMATION

SALUTATION: (Circle one)
 MR or MRS or MS
 FIRST NAME: _____
 LAST NAME: _____
 CONTACT ROLE: _____
 EMAIL ADDRESS: _____

HOME PHONE NUMBER: _____-_____-_____
 MOBILE/CELL NUMBER: _____-_____-_____
 (MAILING) STREET: _____
 (MAILING) P.O. BOX: _____
 (MAILING) CITY: _____
 (MAILING) STATE: _____
 (MAILING) ZIP CODE: _____

FARM INFORMATION

FARM NAME: _____
 (If no physical address, please use Section, Township, Range, **and** Latitude and Longitude)
 FARM SITE STREET ADDRESS: _____
 FARM SITE CITY: _____
 STATE: **MICHIGAN (ONLY)** (Mailing Address May Vary)
 FARM SITE ZIP CODE: _____
 FARM SITE COUNTY: _____
 FARM SITE TOWNSHIP: _____
 LATITUDE: _____ LONGITUDE: _____
 SECTION: _____ TIER: _____ RANGE: _____

(If there is no mailbox at the farm site location or not a place that receives mail.)

FARM MAILING ADDRESS: _____
 (MAILING) STREET: _____
 (MAILING) P.O. BOX: _____
 (MAILING) CITY: _____
 (MAILING) STATE: _____
 (MAILING) ZIP CODE: _____

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