Wild Blueberry Integrated Pest Management for Pollinators

Conservation Practice Job Sheet NRCS, Maine 595

Photo Credit: Frank Drummond

PURPOSE OF THIS PRACTICE

To prevent or mitigate on-site pesticide risks to pollinators and other beneficial insects in and around wild blueberry fields by reducing contact with harmful pesticides.

IMPLEMENTATION REQUIREMENTS FOR THE BLUEBERRY PRODUCER

Refer to the ***Pollinator IPM Conservation Measures Table*** below. The conservation measures table lists conservation measures that avoid and/or minimize pesticide exposure to pollinators and beneficial insects.

CONSIDERATIONS

Cropping Cycle

Fifty percent or more of the practice footprint must be in the crop cycle as averaged over the course of this 2 or 3-year practice implementation.

- If this practice is implemented for 2 consecutive years on a given field, the 50% crop cycle requirement is met.
- If this practice is implemented for 3 consecutive years and 50% or more of the practice footprint is in crop cycle in the first year of the contract, the 50% crop cycle requirement is met.

Pesticides

Some pesticides can kill pollinators outright, while lower doses can have sub-lethal effects that still impact pollinator populations and crop pollination. Certain types of pesticides in combination can be especially dangerous to bees.

Pesticide labels list toxicity to honey bees but not toxicity to native bees. Most native bees are smaller than honey bees and are affected by lower doses. While honey bee colonies may be covered or moved from a field to protect them from pesticides, native pollinators are vulnerable to pesticide applications throughout the year.

The use of selective pesticides that target a narrow range of insects (such as *Bacillus thuringiensis* (Bt) for spanworm) is one way to reduce or prevent harm to bees. Cultural practices can be effective alternatives to insecticide use for some pests, such as burning blueberry fields to control flea beetles, thrips, or tip midge. Also, maintaining a low soil pH in wild blueberry fields through the application of sulphur helps to decrease weed pressure, thus reducing in-field flowering weeds as a site for pesticide exposure to bees. Lowering soil pH may also improve crop yields.

Generally, dusts and fine powders are more dangerous than liquid formulations. This is in part because the dust and fine particles of the pesticide become trapped in the pollen collecting hairs of bees. The chemicals are then fed to developing larvae.

Application Timing with Bloom

Wild blueberry crops should not be sprayed while in bloom, or when flowering weeds are present. Fields should be kept weed-free or mowed just prior to insecticide applications. This minimizes the risk of pesticide exposure to pollinators that would be foraging on flowering weeds in the blueberry field. Night-time spraying of short or intermediate residual insecticides, when bees are not foraging, is one way to reduce bee mortality and harm.

Pesticide Drift

Some blueberry producers and land managers create a **pollinator habitat** to support pollinators and beneficial insects that help control pests naturally. Others may allow field edges and other areas that contain flowering forbs to bloom. Producers should employ deliberate, planned measures to minimize pesticide drift onto these habitats for two major reasons: *Herbicide drift* can kill plants that pollinators depend on when crops are not in bloom, thus reducing the amount of foraging and egg-laying resources available, and *insecticides and fungicides that drift* onto the habitat can directly harm the pollinators.

Windbreaks, conservation buffers, and/or employment of spray application setbacks can be effective means to reduce pesticide drift from adjacent fields onto created or natural habitat. Spray drift can occur as either spray droplets, powders, or vapors. Factors effecting drift include weather, method of application, equipment settings, and spray formulation.

Weather related drift increases with temperature, wind velocity, convection air currents, and during temperature inversions. Wind related drift can be minimized by spraying in the evening when wind velocities are between 2 and 5 mph. Some pesticide labels provide specific guidelines on acceptable wind velocities for spraying a product.

During temperature inversions, spray droplets become trapped in a cool lower air mass and move laterally along the ground - resulting in pesticide drift. Temperature inversions often occur during clear conditions when cool night temperatures follow high day temperatures. Inversions are usually most significant when there is no wind during the early morning before the ground warms. Low humidity and high temperature conditions also promote drift through the evaporation of spray droplets and the corresponding reduction of particle size. Avoid spraying pesticides during inversion conditions.

Spray methods and equipment settings affect the potential for drift. Position nozzle heads close to blueberry plants. Small droplets are most likely to drift the longest distances, so aerial applications should be avoided where feasible. Sprayers should be properly calibrated, which reduces pesticide use, cost, and increases the efficiency of spray operations.

For more information on tactics to reduce pesticide exposure to pollinators, please see the following University of Maine Extension Bulletin, developed specifically for use with this practice:

https://extension.umaine.edu/blueberries/factsheets/bees/2009-ipm-tactics-to-reduce-pesticide-exposure-to-honey-and-native-bees/

RECORDKEEPING

Recordkeeping is a requirement of this practice. Blueberry producers must record pesticide applications in a Pesticide Applicator's Log (PA Log). For conservation measures that do not involve the application of pesticides, recordkeeping may include, pest monitoring/scouting dates and results, photo documentation of completed conservation measures, copies of soil tests with recommended sulphur rates, and receipts for purchases of sulphur required to satisfy soil test recommendations.

PESTICIDE APPLICATION

Do not apply pesticides near sensitive areas, in accordance with product labeling. **Refer to attached Conservation Plan Map(s) for location of sensitive resources.**

SAFETY

- Prior to use, inspect and replace worn nozzle tips, cracked hoses, and faulty gauges on spray equipment.

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, and reservoirs.
- Post signs, according to label directions and/or federal, state, tribal, and local laws, around fields that have been treated. Follow restricted entry intervals.
- Dispose of herbicide and herbicide containers in accordance with label directions and adhere to federal, state, tribal, and local regulations.
- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS). MSDS and herbicide labels may be accessed on the Internet at: http://www.agrian.com/labelcenter/results.cfm
- The national Chemical Transportation Emergency Center (CHEMTREC) telephone number is: 1-800-424-9300
- For non-emergency information: The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, **1-800-858-7384** Monday to Friday, 11:00 a.m. to 3:00 p.m ET.

For Safety Emergencies Contact:

Northern New England Poison Center
22 Bramhall St.
Portland, Maine 04102
1-800-222-1222

OPERATION AND MAINTENANCE FOR THIS PLAN

- Review and update this plan periodically to: assess the need for new IPM strategies, respond to cropping system and pest complex changes, and avoid the development of pest resistance.
- Maintain mitigation techniques identified in the plan to ensure continued pollinator protection.
- Calibrate application equipment according to Extension and/or manufacturer recommendations before each season of use and with each major chemical change.
- Maintain records of pest management for at least two years. Application records shall be in accordance with State of Maine Pesticides Control Board Pesticide Record Keeping program and site-specific requirements.

Producer:	**Tract(s)/Fields(s) and cycle of each field:** **Acres:**
Plan Developed By:	**Date:**
Plan Approved By:	**Date:**

Planning Inventory: LIST OF CURRENTLY USED PESTICIDES

The drop down menus in these tables contain all pesticides approved by UMaine Extension for use in lowbush blueberry. If your client currently uses something that is not on this list, then consider suggesting the conservation measure, "Only use UMaine Extension recommended pesticides." There is no need to select both an active ingredient and trade name for a product.

Insecticides

Insecticide Active Ingredient	Trade Name	When Used	Target Pest	If lower toxicity replacement used to meet conservation measures, list replacement here

Fungicides

Fungicide Active Ingredient	Trade Name	When Used	Target Pest	If lower toxicity replacement used to meet conservation measures, list replacement here

Fungicide Active Ingredient	Trade Name	When Used	Target Pest	If lower toxicity replacement used to meet conservation measures, list replacement here

Herbicides

Herbicide Active Ingredient	Trade Name	When Used	Target Pest	If lower toxicity replacement used to meet conservation measures, list replacement here

POLLINATOR IPM CONSERVATION MEASURES (PRACTICE 595) FOR WILD BLUEBERRY PRODUCERS

The first two conservation measures are required when applicable. That is, the prohibition against systemic insecticides during bloom is only in place on fields in the crop cycle. To satisfy the requirements of practice for a field in the crop year, the produer must accumulate a total of 12 points (including 8 points for the two required activities). In the prune year, the producer must accumulate only 8 points (including 4 points for the required monitoring and pest action thresholds). Except for Required Activities 1 and 2, all selected conservation measures must be newly adopted. The conservation measures selected may differ between years and fields.

	#	Activity	Information	Required Records	Check if Currently Practiced	Planned for		Point Value
						Bloom	Prune	
Required Activity	**1**	No systemic insecticides before or during bloom	Do not apply **systemic** insecticides (1) (*e.g.*, neonicotinoids) BEFORE or DURING crop bloom. Wild blueberries typically bloom from May 15 to June 15. **Required only on crop year fields.**	Contract year's PA Log* demonstrating adherence to this conservation measure				**4**
	2	Monitoring & Pest Action Thresholds	**Only necessary for five major pests described in guidance document (4) and for mummyberry. For insects**: conduct pest monitoring and only apply insecticides in a field only when the University of Maine Extension's action thresholds (4) are reached. **For mummyberry**: Use the University of Maine Extension's Mummyberry Forecast Model (5). Apply fungicides for mummyberry if University of Maine Extension's Mummyberry Forecast Model predicts an infection. Use as applicable on crop and prune year fields.	Contract year's PA Log* that includes threshold monitoring data and action thresholds used.				**4**
Pesticides Use Options	**3**	Only UME recommended pesticides	Only use pesticides that are listed for wild blueberries by the University of Maine Cooperative Extension (1,2,3). Use on crop or prune year fields.	Contract year's PA Log* demonstrating adherence to this conservation measure				**1**
	4	No insecticides during bloom	Do not apply **any** insecticides during crop bloom (typically from May 15 to June 15). Use only on crop year fields.	Contract year's PA Log* demonstrating adherence to this				**2**
	5	Evening spraying	Instead of applying long-persistence insecticides during the day, apply short or moderate persistence insecticides in the evening (3 hours prior to sunset). University of Maine Cooperative Extension Insecticide Guide lists short, moderate, and long-persistence insecticides (1). Use on crop or prune year fields.	Documentation that indicates prior use of long-residual insecticides during the day AND contract year's PA log indicating evening applications of short/intermediate residual insecticides.				**1**

	#	Activity	Information	Required Records	Check if Currently Practiced	Planned for		Point Value
						Bloom	Prune	
Pesticide Use Options	**6**	Low-toxic insecticides or biologicals	Instead of applying moderate or high- toxicity insecticides, employ biological controls (e.g., Bt, Mycotrol) and/or low-toxicity pesticides instead of moderate or high-toxicity insecticides. The University of Maine Cooperative Extension Insecticide Guide lists effective biocontrol options, and which insecticides are considered low, moderately, and highly toxic to pollinators (1). Use on crop or prune year fields.	Documentation that indicates prior use of moderate or highly toxic insecticides AND contract year's PA Log that lists no moderate or highly toxic insecticides and indicates use of biologicals or low-toxic insecticides instead.				**1**
	7	No tank mixing of insecticides or fungicides	Do not spray more than one insecticide or fungicide at a time. Herbicides may be tank mixed. Synergistic effects of pesticides can be very detrimental to bees. Insecticides/fungicides should be applied separately and several days apart. Use on crop or prune year fields.	Contract year's PA Log* demonstrating that no more than no more than 1 insecticide or fungicide was applied on the same field on the same day.				**1**
	8	No fungicides during bloom	Do not apply fungicides (2) during crop bloom (typically May 15 to June 15). Use only on crop year fields.	Contract year's PA Log* demonstrating adherence to this conservation measure.				**2**
	9	No DMI fungicides within 3 days of neonicotinoids or pyrethroids	Do not apply demethylation inhibitor fungicides **(DMI) fungicides** (2) within 3 days of neonicotinoid or pyrethroid applications. DMI fungicides (e.g., fenbuconazole, propiconazole) can increase the toxicity of neonicotinoid and pyrethroid insecticides. Use on crop or prune year fields.	Contract year's PA Log* demonstrating adherence to this conservation measure.				**1**
	10	Application buffer**	Establish a **fungicide and insecticide free buffer** around major pollinator habitat areas: 10 feet for hand-applications (e.g., backpack or handheld sprayer); 40 feet for ground-based applications. Pollinator habitat includes any areas with permanent flowering habitat (e.g., old fields, flowering crops, flowering cover crops, and intentionally created pollinator habitat). If spatial buffers consist of an unsprayed section of a blueberry field then the buffer must be clearly delineated via a physical marker. Use on crop or prune year fields.	Install signs and flagging to delineate a pesticide- free buffer. If warranted, signs should be installed every 100 feet. Provide photo documentation of signs and flags.				**2**

	#	Activity	Information	Required Records	Check if Currently Practiced	Planned for		Point Value
						Bloom	Prune	
Cultural Activity Options	11	Avoid pesticide drift	Avoid spray drift onto flowering areas (especially field edges and pollinator plantings). Initiate spraying only when wind speed is between 2 and 5 mph. If below 2 mph, air temperature inversion conditions may exist. Air temperature inversions provide perfect conditions for small pesticide droplets to drift away from target plants. Indications of a temperature inversion include: fog, dew on the upper blueberry leaves, very calm conditions (7). Use on crop or prune year fields.	Contract year's PA Log*. PA Log should identify wind speeds when pesticide was applied. Pesticides should not be sprayed when wind speed is > 5 mph or when conditions for an air temperature inversion exist.				1
	12	Remove flowering weeds	Remove flowering weeds in blueberry field before insecticide or fungicide spray applications. Mechanical (weed whacker) or chemical (herbicides) treatments can be used to remove flowering weeds. Use on crop or prune year fields.	Provide documentation (e.g., photos) of significant flowering weed reduction (before and after) by time of spray application.				1
	13	Sulphur for weed control	Maintaining a low pH through the application of sulphur helps to decrease weed pressure, reducing the risk of exposing bees foraging on weeds to pesticides. Sulphur must be applied at a rate recommended by the University of Maine Soil Laboratory based upon a recent (past 3 years) soil test. Use in crop or prune year fields.	Provide copies of soil test(s) with sulphur recommended rates, receipt for amount of sulphur required to satisfy soil test recommendations.				1
	14	Spot burning	Use targeted spot-burning as the primary method to control one or more pests and reduce the need for pesticide applications. Can be used to control, e.g., thrips and/or tip midge. Use in crop or prune year fields.	Provided a copy of pest monitoring/scouting records and/or photo documentation of spot- burning.				1

	#	Activity	Information	Required Records	Check if Currently Practiced	Planned for		Point Value
						Bloom	Prune	

Education Options	**15**	Attend workshop	Attend a pollinator short course, workshop, or presentation for which Pesticide Applicator credits are provided. One course per year will satisfy all fields (regardless of cycle) treated within the same year.	Carbon copy of attendance record provided by Maine Board of Pesticide Control at course. Course subject matter must be about pollinators.				**1**
	16	Monitor pollination	Record honey bee and native bee pollinators on blueberry blossoms to estimate fruit set. Monitoring should be done in each field and in accordance with this UMaine Extension video (8). Use in crop year only.	Provide copy of completed Estimating Bee Abundance Worksheet for each field (9).				**1**
Total Points (Must achieve at least 12 points in crop year fields) (Must achieve at least 8 points in prune year fields)								

(1) UMaine's Insecticide Guide: Available in USDA-NRCS Maine eFOTG under the IPM (595) practice for pollinators. A hard copy should be provided to client.

(2) UMaine's Fungicide Guide: Available in USDA-NRCS Maine eFOTG under the IPM (595) practice for pollinators. A hard copy should be provided to client.

(3) UMaine's Herbicide Guide: Available in USDA-NRCS Maine eFOTG under the IPM (595) practice for pollinators. A hard copy should be provided to client.

(4) Maine NRCS 595 blueberry pest monitoring guide: Available in USDA-NRCS Maine eFOTG under the IPM (595) practice for pollinators. A hard copy should be provided to client.

(5) UMaine's Mummyberry Forecast Model: https://extension.umaine.edu/blueberries/factsheets/blueberry-blog/

(6) Maine NRCS 327 Practice Standard: https://efotg.sc.egov.usda.gov/api/CPSFile/10945/327_ME_CPS_(Con)servation_Cover_2015

(7) UMaine Fact sheet 303, Minimizing off-target deposition: https://extension.umaine.edu/blueberries/factsheets/integrated-crop-management/minimizing-off-target-deposition-of-pesticide-applications/

(8) UMaine video on how to estimate abundance of bees in Maine blueberries: https://extension.umaine.edu/blueberries/estimating-the-strength-of-your-pollinator-force-in-wild-blueberry/

(9) Estimating Bee Abundance Worksheet: Available in USDA-NRCS Maine eFOTG under the IPM (595) practice for pollinators. A hard copy should be provided to client. https://efotg.sc.egov.usda.gov/api/CPSFile/17826/595_ME_GD_Integrated_Pest_Management-Bee_Abundance_Estimation_Worksheet_2019

***PA Log: Producer must provide a copy of the contract year's Pesticide Applicator's Log, and then copies of log for each year contracted.**
****Application buffer guidelines correspond to requirements for spray buffers around NRCS cost-shared (or CTA supported) pollinator habitats under the New England Pollinator Partnership. If application is under the New England Pollinator Partnership, producer must follow buffer BMP guidelines around NRCS cost-shared (or CTA supported) pollinator habitats.**

Scoresheet: Point-Tracking for Practice IPM for Pollinators (595)

(Fill out at Planning, compare to records and check off each item when performing Checkout)

Planned items. Identify by category and item number from Jobsheet list. (ex: P-3) P= Pesticide Use C= cultural practice E = Education R = Required	**Year 1: 20___**		**Year 2: 20___**		**Year 3 (optional): 20___**	
	Crop Year Fields, Points Earned	**Prune Year Fields, Points Earned**	**Crop Year Fields, Points Earned**	**Prune Year Fields, Points Earned**	**Crop Year Fields, Points Earned**	**Prune Year Fields, Points Earned**
R – 1 No systemics before/during bloom*		NA		NA		NA
R – 2 Monitoring/Thresholds**						
Total Annual Score:						

Notes:

*Required item in Crop Year only **Required item every year

IPM Activities Producer Record-Keeping Sheet* YEAR_____

Date	Activity	Location/Crop Cycle/Acres	Notes and Relevant Pages in Applicator Log

*Recordkeeping is required for practice payment. This format is not required. It is offered as an option.

Practice Certification and Checkout for Integrated Pest Management			
	Year 1	**Year 2**	**Year 3**
Date Practice Completed by Producer			
Date Records Checked (copy attached)			
Checked by			
Approved by			
Meets Requirements of standard and Spec	☐	☐	☐
Does NOT Meet Requirements of the 595 Standard and Specs	☐	☐	☐
Meets with the Following Changes:			