NRCS Natural Resources Conservation Service

Integrated Pest Management for Pollinators

Conservation Practice WV Job Sheet ***Code 595***

DEFINITION

This practice outlines site-specific combinations of pest monitoring or avoidance and suppression strategies.

PURPOSE

This practice is used to outline practices and strategies to avoid detrimental affects to pollinators and their resources in a cropland setting.

Integrated Pest Management (IPM) strategies involve prevention, avoidance, monitoring and suppression (PAMS). PAMS are usually employed to prevent or mitigate pest management risks.

CRITERIA

If pesticide use is an integral part of the farm operation and it is not practical to eliminate from the operation, landowners should be provided risk assessments using NRCS protocols such as a pesticide screening tool (i.e. Win-PST).

A Win-PST Soil/Pesticide Interaction Hazard rating should be attached to this document.

The conservation planner who prepared the plan should provide along with this jobsheet a copy of a Win-PST report. This report identifies potential hazards with respect to the types(s) of pesticides with respect to the soil types and other factors associated with pesticide application. This results in a final hazard rating. Depending on this rating certain practices must be implemented or maintained in order to offset the identified risk(s).

For pollinators the chief risk is direct contact with pesticides. Other risks may also be identified and are outlined in this job sheet if they apply.

CONSIDERATIONS

Pesticides may be detrimental to a healthy community of native pollinators. Insecticides not only kill pollinators, but sub-lethal doses can affect their foraging and nesting behaviors, often preventing plant pollination and bee reproduction. Herbicides can kill plants that pollinators depend on when crops are not in bloom, thus reducing the amount of foraging and egg-laying resources available.

Broad-spectrum chemicals should be avoided if at all possible. If pesticides cannot be avoided, they should be applied directly on target plants to prevent drift.

Crops should not be sprayed while in bloom and fields should be kept weed free (or mowed just prior to insecticide applications). This discourages pollinators from venturing into the crop if sprayed outside of the bloom period. Night-time spraying, when bees are not foraging, is one way to reduce bee mortality. Periods of low temperatures may also be beneficial for spraying since many bees are less active in cooler conditions. However, the residual toxicity of many pesticides tends to last longer in cool temperatures. Dewy nights may cause an insecticide to remain wet on the foliage and be more toxic to bees the following morning.

In general, while pesticide labels may list hazards to honey bees, the potential dangers to native bees are often not listed. Many native bees are much smaller in size than honey bees and are affected by lower doses of chemicals. Also, honey bee colonies may be covered or moved from a field, whereas wild natives will continue to forage and nest in areas that have been sprayed.

The use of selective pesticides that target a narrow range of insects, such as *Bacillus thuringiensis* (*Bt*)

for moth caterpillars, is one way to reduce or prevent harm to beneficial insects like bees.

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 consequently fed to developing larvae.

Alternatives to insecticides are also available for some pests, such as pheromones for mating disruption, and kaolin clay barriers for fruit crops. Local West Virginia University Extension Service personnel may be able to assist with the selection of less toxic pesticides or with the implementation of integrated pest management (IPM) programs. Contact your WVU County Extension Agent for more information at: http://ext.wvu.edu/ .

Landowners who encourage native plants for pollinator habitat will inevitably be providing habitat that will also host many beneficial insects that help control pests naturally. This may result in less dependency of pesticide application.

In addition to providing pollinator habitat, windbreaks, hedgerows, and conservation buffers can be effective barriers to reduce pesticide drift from adjacent fields. Spray drift can occur as either spray droplets 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 during early morning or in the evening when wind velocity is often lower. However, even a light wind can cause considerable drift. Pesticide labels will occasionally provide specific guidelines on acceptable wind velocities for spraying a particular product. Always check and follow those recommendations when present.

Mid-day spraying is also less desirable because as the ground warms, rising air can lift the spray particles in vertical convection currents. These droplets may remain aloft for some time, and can travel many miles.

Similarly, during temperature inversions spray droplets become trapped in a cool lower air mass and move laterally along the ground. Inversions often occur when cool night temperatures follow high day temperatures. These are usually worst during 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.

Spray application methods and equipment settings also strongly influence the potential for drift. Since small droplets are most likely to drift the longest distances, aerial applications and mist blowers should be avoided where feasible. Standard boom sprayers should be operated at the lowest effective pressure and with the nozzles set as low as possible. Drop nozzles should be used to deliver insecticide within the crop canopy where it is less likely to be carried by wind currents. Regardless of the chemical or type of application equipment used, sprayers should be properly calibrated to ensure that excess amounts of pesticide are not applied.

Nozzle type also has a great influence on the amount of drift a sprayer produces. Turbo jet, raindrop, and air-induction nozzles produce less drift than conventional nozzles. Standard flat fan or hollow cone nozzles are generally poor choices for reduction of drift. Select only nozzles capable of operating at low pressures (15 to 30 psi) to produce larger, heavier droplets. Finally, oil-based chemical carriers produce smaller, lighter droplets than water carriers and should also be avoided when possible. Consider using thickening agents if they are compatible with the pesticide.

OPERATION AND MAINTENANCE

Review and update your plan periodically in order to incorporate new IPM strategies, respond to cropping system and complex pest changes and avoid the development of pest resistance.

Calibrate the 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. Pesticide application records should be in accordance with USDA Agricultural Marketing Service's Pesticide Recordkeeping Program and site specific requirements. This jobsheet may serve as records if completed.

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SPECIFICATIONS

Site-specific requirements are listed on the specifications sheet. Additional provisions are entered on the job sketch sheet. Specifications are prepared in accordance with the NRCS Field Office Technical Guide. This job sheet is considered part of the conservation plan.

Client:	Farm #:
Field:	Tract #:
Designed By:	Location:
Date:	Total Acres:

Purpose (check all that apply)

☐ Mitigate pesticide application to areas for pollinator enhancement	☐ Win-PST Soil/Pesticide Interaction Hazard Rating results attached or included (REQUIRED-Completed by NRCS)

Other Identified Resource Concerns as indicated by WIN-PST Rating Results (check all that apply)

☐ Human Hazard Solution for solution runoff risk to drinking water	☐ Human Hazard Leaching for leaching risk to drinking water
☐ Fish Hazard Solution for runoff risk to aquatic habitat	☐ Fish Hazard Leaching for leaching risk to aquatic habitat (lateral flow to streams)
	☐ Fish Hazard Adsorbed for adsorbed runoff risk to aquatic habitat including benthic organisms

WIN-PST Information - If other hazards for pollinators (in addition to direct contact) are identified, indicate and identify the minimum mitigation score as applicable.

Identify any other associated hazards in addition to "direct"	**WINPST Report Soil/Pesticide Interaction Hazard Rating Score(s)**	**Minimum Mitigation Index Score(s) Level Needed**
☐ Drift ☐ **Direct Contact (pollinators)** ☐ Adsorbed Runoff ☐ Solution Runoff ☐ Leaching	_____ _____	_____ _____

Conservation Practices used to offset hazard – If applicable**, i**dentify all conservation practices utilized to mitigate for any other identified hazard(s) rating.

Conservation Practice	Points	Conservation Practice	Points

SPECIFICATIONS

If needed, an aerial view or a side view of the practice can be shown below. Other relevant information, complementary practices and measures, and additional specifications may be included.

Apply a minimum of two (2) IPM mitigation techniques for direct contact (identify each technique as applicable)				
Mitigation Techniques Required To Offset Highest Hazard(s)	**Field #** ____	**Field #** ____	**Field#** ____	**Field #** ____
Time pesticide applications when pollinators are least active (e.g., at night or when temperatures are low). Note that dewy nights may cause an insecticide to remain wet on the foliage and still be active the following morning, so exercise caution.				
Time pesticide applications when crops are not in bloom and keep fields weed free to discourage pollinators from venturing into the crop.				
Use pesticides that are less toxic to pollinators and beneficial species. Note: all pesticide recommendations must come from the Cooperative Extension Service or an appropriately certified crop consultant.				
Use selective insecticides that target a narrow range of insects (e.g., *Bacillus thuringiensis* (Bt) for moth caterpillars) to reduce harm to beneficial insects like bees.				
Use liquid or granular formulations instead of dusts and fine powders that may become trapped in the pollen, collecting hairs of bees and consequently fed to developing larvae.				
Use alternatives to insecticides such as pheromones for mating disruption and kaolin clay barriers for fruit crops.				
Time pesticide applications when pollinators are least active (e.g., at night or when temperatures are low). Note that dewy nights may cause an insecticide to remain wet on the foliage and still be active the following morning, so exercise caution.				
Time pesticide applications when crops are not in bloom and keep fields weed free to discourage pollinators from venturing into the crop.				

Additional Specifications and Notes: (i.e. site conditions prior to establishment, operation and maintenance specifics, etc.)

Maintain this practice as outlined in the section of this document entitled "Operation and Maintenance".

Questions regarding the planting or maintenance of the tree/shrub establishment should be directed to:

_____ **at** _____

Clear Form