

Integrated Pest Management Herbicide Resistance Weed Conservation Plan

Criteria Practice/Activity Code (154)

1. Definition:

Integrated Pest Management Herbicide Resistance Weed Conservation Plan is ecosystem-base, with an emphasis to modify herbicide use for suppressing weeds on cropland by utilizing four IPM strategies Prevention, Avoidance, Monitoring and Suppression that will be implemented with the augmentation of three key essential conservation practices Crop Rotations, Cover Crops, Residue Tillage Management, and IPM techniques especially Monitoring/Scouting, with the judicious use of herbicides.

- To change herbicide rotation (modes of action and herbicide) and intensify mechanical practices initially as well as some manual labor may be needed where farms are presently populated with herbicide resistance weeds;
- To change herbicide rotation (modes of action and herbicide) and increase the use of conservation practices along with IPM techniques that prevent early term resistance weeds on farms;
- Minimize resistance weeds seed production by reducing the weed populations before the flowering stage or before maturity;
- To manage the weeds seed bank with a healthy soil (cover crops) which improve soil biological activity and shorten the half-life of the weed seed bank at the same time having a desirable habitat for seed predators (invertebrates, small rodents, birds) that consume weed seed.
- Manages resistance weeds economically;
- Addresses operator's objectives;
- Meets NRCS quality criteria for soil, water, air and plant quality;
- Complies with federal, state, tribal, and local laws, regulation and permit requirements;

2. IPM Herbicide Resistance Weed Conservation Plan Criteria

This section establishes the minimum criteria to be addressed in the development and implementation of IPM Herbicide Resistance Weed Conservation Plan on cropland

A. General Criteria

1. An IPM Herbicide Resistance Weed Conservation Plan shall be developed by certified Technical Service Providers (TSPs). In accordance with Section 1240 (A), the Environmental Quality Incentive Program (EQIP) program provides funding support through contracts with eligible producers to obtain services of certified TSPs for development of IPM Herbicide Resistance Weed Plan. The specific TSP criteria required for IPM Herbicide Resistance Weed Plan development is located on the TSP registry (TechReg) web site at:
<http://techreg.usda.gov/>

B. The planner shall address the following items during the IPM Herbicide Resistance Weed Conservation Plan development process:

- 1) Background and site information
- 2) Site specific assessment of environmental risk associated with existing and alternative weed suppression system
- 3) Monitoring guidelines
- 4) Consult with Weed Society of America; <http://www.hracglobal.com> and State University's IPM guidelines for specific crops (optional)
- 5) Record Keeping
- 6) Herbicide Resistance Weed Plan (record of decisions) to address the identified environmental risks associated with weed suppression activities with implementation specification and other resource concerns.
- 7) References, if needed.

C. IPM Herbicide Resistance Weed Plan Specific Element Criteria

Each of the IPM Herbicide Resistance Weed Plan elements will address the specific below. The degree to which these criteria are addressed in the development of a site-specific IPM Herbicide Resistance Weed Plan is determined by the General Criteria and the specific criteria provided for each element of the IPM Herbicide Resistance Weed Plan below.

1) **Background and Site Information.** This element provides a brief description of:

- a) Name of owner/operator;
- b) Tract and field(s) location;
- c) Soil map units;
- d) Resource concerns;
- e) Present site use and general management being applied;
- f) History of weed management activities.

2) **Site Specific Assessment of Environmental Risks Associated with Existing and Alternative Weed Management System.** This element provides a brief description and maps including:

- a) Conservation Plan Map;
- b) Field Locations of planned areas;
- c) Soil type and characteristics; not potential for runoff or permeability
- d) Site conditions risk description;
- e) Identification of weeds, crop, plant community condition and degree of infestation;
- f) Irrigation system and management (where appropriate);
- g) Locations of sensitive resource areas identified on the plan map to include:
- h) Streams, drains, surface water, wetlands, wells, groundwater, drains, grassed waterways and existing buffer practices;
- i) Sensitive wildlife habitat (on and off-site), food plots;
- j) Potential off-target drift areas;
- k) Consideration for pollinator habitat and pollinator protection;
- l) Other risk mitigation practices in use.

3. **IPM key essential technique of an IPM Herbicide Resistance Weed Conservation Plan Monitoring/Scouting.** This element addresses scouting strategies that addresses weeds population levels, minimizing weeds maturity and the reduction of seed production. The scouting report should include:

- a) List of crops to be maintained;

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- b) Thresholds which may be a goal of zero base on the tolerant level for the specific weed and monitoring frequency;
- c) Scouting for weeds population levels with dates and results;
- d) Soil test results;
- e) Weather forecasting;

Scouting frequency during cropping season for herbicide resistance weeds will require a high frequency due to grow intensity. After harvesting the frequency of scouting may be reduce. After harvesting the main concern of managing weeds, do not allow them to mature (produce seeds). See scouting frequency chart below for sustainability in suppressing herbicide resistance weeds populations.

Scouting

| Effectiveness | Frequency |
|----------------------|------------------|
| Good | 1-2 days |
| Declining | 3-4 days |
| Poor | ≥ 5 days |

4. Three key essential conservation practices of an IPM Herbicide Resistance Weed Conservation Plan.

- a) *Conservation Crop Rotation (328)* is the initial building block of an IPM Herbicide Resistance Weed Plan. It provides crop diversity, improve soil quality and impact plant community by lessen the condition for the invasion of weeds. See below the conservation crop rotation chart below for effectiveness.

Conservation Crop Rotation

| Effectiveness | Duration |
|----------------------|-----------------|
| Good | ≥ 3 yrs |
| Declining | < 3 yrs |
| Poor | < 2 yrs |

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- b) Cover Crop (340) practice is a supporting building block of an Herbicide Resistance Weed Plan. For this plan it will be use in combination with conservation crop rotation to assist in the suppression of weeds. However cover crops are essential for soil quality and crop production. Cover crops can be terminated effectively by harvest, frost, mowing, tillage, crimping and/or herbicides in preparation for the following crop, simultaneously suppressing weeds. An effective use of cover crops for herbicide resistance weeds is to alternate each seasonal cover crops species with different species; warm season cover crop species and cool season cover crop species.
- c) Residue Tillage Management is another supporting building block of the plan to suppress weeds. These particular conservation practices are applied in various ways as to the use of not making the site desirable for weeds growth that includes; Mulching (484), Residue Management Seasonal (344), Residue and Tillage Management Ridge Till (346), Residue and Tillage Management No Till/Strip Till/Direct seed, and Residue and Tillage Management Mulch Till (345). Residue content assessment is site specific as well as generalized area where the content requirements require heavy coverage to address the condition properly.
- d) Herbicide use is last building box of planning tactical sequence for an IPM Herbicide Resistance weed plan. It should be noted that herbicides are not the do all for weed suppression. The use of herbicides need to be judicious; proper application rate, proper timing, proper weather conditions, rotate different herbicides annually, and change mode of action regularly. Make use of extension recommendations and followed label warnings and instructions. See chart below for herbicide rotation effectiveness

Herbicide Rotation Frequency

| Effectiveness | Rotation modes of action | Rotation of herbicide |
|----------------------|---------------------------------|------------------------------|
| Good | 3-4 applications | 1 year |
| Declining | 5-6 applications | 1-2 years |
| Poor | > 6 applications | ≥ 2 years |

5. Window Pesticide Screening Tool (WIN-PST) is NRCS supported tool that is used to assess relative pesticide leaching, solution runoff, and adsorbed runoff risks to water quality. WIN-PST analysis is based on:

- Soil properties
- Pesticide physical properties
- Pesticide toxicity data

The major components of the NRCS no-point source water quality pesticide risk analysis are:

- 1) The potential for pesticide loss in
 - water that percolates below the root zone;
 - water that runs off the edge of the field;
 - sediment that leaves the field in run off;
- 2) Chronic (long term) pesticide toxicity to human drinking water and aquatic habitat;
- 3) And the combination of pesticide loss potential with pesticide toxicity to provide site specific ratings for pesticide hazard in leaching, solution runoff, and sediment adsorbed runoff.

6. Recordkeeping. This element addresses list of records that shall be maintained detailing:

- a) Date of monitoring;
- b) Results of monitoring;
- c) Identification of crop and/or plant community condition;
- d) Threshold of infestation or tolerant level for each specific weed
- e) Tactics implemented with dates
- f) All required records required by state and federal requirements;
- g) Records required or needed as part of the State University IPM guidelines being used.

7. Conservation Plan (record of decisions) *Utilizing Customer Service Toolkit – Plug-In or MsWord Document*) to address the identified environmental risks associated with weed suppression activities with implementation specifications and other resource concerns.

The record of decisions shall include the planned practice(s), schedule for implementation, and site specific specifications to apply the conservation practice. The site specific specifications for the non-engineering type practices can be on an NRCS Job sheet available for the conservation practice or in a narrative form in a document. Planned engineering type practices shall include the conservation practice, schedule of implementation, and identified on the plan map. The plan may include, but not limited to the conservation practices listed below:

- a) Brush Management (314)
- b) Conservation Crop Rotation (328)
- c) Cover Crop (340)
- d) Conservation Cover (327)
- e) Early Successional Habitat Development/Management (647)
- f) Filter Border (386)
- g) Hedgerow Planting (422)
- h) Irrigation System, Microirrigation (441)
- i) Irrigation Water Management (449)
- j) Land Smoothing (466)
- k) Mulching (484)
- l) Nutrient Management (590)
- m) Pasture and Hayland Planting (512)
- n) Prescribed Grazing (28)
- o) Residue and Tillage Management, Mulch Till (345)
- p) Residue Management, No Till/Strip Till/Direct Seed (329)
- q) Residue Management, Ridge Till (346)
- r) Residue Management, Seasonal (344)
- s) Stripcropping (585)
- t) Terrace (600)
- u) Upland Wildlife Habitat Management (645)
- v) Windbreak/shelter Belt Establishment (380)

8. References: USDA NRCS Field Office Technical Guide

9. Deliverables for the Client – hardcopy of the plan that includes:

- Cover page – name, address, phone of client and TSP; Total Acres of the plan, signature blocks for the TSP, producer, and a signature block for the NRCS acceptance.
- Soils map and appropriate soil descriptions
- Resource assessment result (wind and water erosion, water availability, soil fertility, and other that may be needed)
- For management practices. The planned practices and the site specific specifications on how each practice will be applied; when the practice specifications on how each practice will be applied; when the practice will be applied, and the extent (acres or number) that will be applied.
- For engineering/structural practices. The planned practice when it will be applied and extent, and located on the conservation plan map.

10. Deliverables for NRCS Field Office:

- Complete Hardcopy and Electronic copy of the client's plan (MsWord copy).
- Digital Conservation Plan Map with fields, features, and structural practices located.
- Digital Soil Map