

Integrated Pest Management

Nebraska Conservation Planning Sheet No. 10



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What is Integrated Pest Management (IPM)?

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls.

The two primary goals of IPM are to prevent environmental risks if possible and then to mitigate environmental risks that cannot be prevented.

The practice is site-specific in nature, based on approaches suited for a particular crop, pest & location.

IPM strategies (Prevention, Avoidance, Monitoring and Suppression or "PAMS") shall be incorporated into the planning process and employed to prevent or mitigate pest management risk for identified natural resource concerns.

IPM combines biological, cultural, and other alternatives to chemical control with the planned use of pesticides to keep pest populations below damaging levels, while minimizing harmful effects of pest control on humans and natural resources.

IPM is environmentally responsible & economically practical crop protection.

How it Helps the Land

Conservation of environmental quality (i.e. water, air, soil, wildlife and plant life) is an important element of integrated pest management.

Practices that maintain environmental quality can conserve natural enemies that may help lower pest threats of target insects. IPM techniques that minimize environmental impact will contribute to the stability of agricultural systems.



Scouting for pest, including weeds, diseases & insects, a key component of IPM

IPM is managing to limit agricultural pests. It reduces adverse effects on plant growth, crop production, and the environments.

When possible, cultural methods, such as crop rotations, are used to reduce pesticide use. By reducing the need for pesticides, the potential for surface and ground-water contamination is reduced.

IPM utilizes chemical methods only when needed. When pesticides are used, the pesticide is selected based on how well it controls the pest(s) and the potential of the pesticide to be lost in the environment.

Where the Practice Applies

This practice applies on all land where weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species) pose a threat to the designated land use.

Herbaceous Weed Control (Code 315) includes the treatment of invasive, noxious and prohibited plants.

Woody (non-herbaceous or non-succulent) plants including those that are invasive & noxious shall be treated through Brush Management practice (Code 314).

Where to Get Help

For assistance in planning an IPM system, contact local NRCS office, Extension office, or a private crop consultant.

Requirements of IPM

A comprehensive IPM plan utilizing "PAMS" strategies will be developed to document how pest management risks will be prevented or mitigated. IPM must be crop and/or land use specific and adhere to applicable elements and guidelines accepted by the University of Nebraska – Lincoln (UNL).

IPM strategies shall be employed to prevent or mitigate risks identified natural resource concerns.

For identified water quality concerns related to pesticide leaching, solution runoff and adsorbed runoff, the current version of the USDA-NRCS WIN-PST program will be used to evaluate potential risk to humans and/or fish, as appropriate, for each pesticide to be used.

Additional mitigation techniques shall be employed when WIN-PST Soil/Pesticide Interaction Hazard Ratings are intermediate or higher and if planned conservation practices do not provide adequate mitigation.

PAMS Techniques

IPM guidelines can be obtained from the UNL or Cooperative Extension or may be supplemented from appropriately certified professionals. Refer to UNL publications for guidance on crop specific IPM strategies.

Example IPM Prevention, Avoidance, Monitoring, and Suppression techniques include:

- **Prevention** includes the use of pest-free seeds and transplants, cleaning tillage and harvesting equipment between fields, and appropriate cultural practices.
- **Avoidance** includes the use of pest resistant crop varieties, transgenic crops, crop rotations, pesticide rotation, trap crops for pests, planting dates, nutrient and water management, and other cultural options to prevent pests from reaching economically damaging levels.
- **Monitoring** includes pest scouting, crop monitoring, soil testing for nutrients, soil water monitoring, and weather monitoring to target suppression activities at the appropriate time and ensure that pesticide applications are based on economic thresholds. Monitoring also ensures that cultural and biological techniques are appropriate.
- **Suppression** includes cultural, biological, and chemical controls to manage pest populations at an economic level. When appropriate utilize non-chemical options such as mechanical-cultural methods, including cultivation and early harvest and/or biological controls.

IPM Considerations

The following IPM principles should be considered when appropriate:

- Adequate plant nutrients & soil moisture, including favorable pH & soil quality, can reduce plant stress, improve plant vigor & increase plant's overall ability to tolerate pests.
- On irrigated land, irrigation water management should be designed to avoid conditions conducive to disease development & minimize off-site contaminant movement.

- When necessary to use chemical controls, consider the following to determine the potential impact on water quality:
 - Pesticide efficacies, meaning that the product chosen will successfully full fill the intended results.
 - Pesticide characteristics such as solubility, toxicity, degradation products, mobility, persistence, adsorption; and relationships to site characteristics such as soil, geology, depth to water tables and proximity to surface water.
 - Site conditions, such as slope, climate; and sensitive areas.
- Consider selecting pesticides that are less hazardous to human health.
- Consider present soil moisture, anticipated weather conditions, and irrigation plans to achieve the greatest efficacy and reduce potential for offsite transport.
- Consider method of pesticide application such as ground or aerial spraying, chemigation, wicking, application of granules, etc., because the degree of drift and volatilization will vary considerably by method.

Plans & Specifications

The IPM plan shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

The IPM plan shall include at a minimum:

1. Purpose/Goals/Objectives,
2. Plan map & soil map of affected area,
3. Location of sensitive areas,
4. WIN-PST Soil/Pesticide Interaction Hazard Report (for each planned pesticide and major soil type in pest management area) as applicable,
5. Identification of appropriate mitigation techniques required for the resource concern based on the final risk rating in the WIN-PST Soil/Pesticide Interaction Hazard Ratings (See Tables I & II of NE Tech Note 110),
6. Prevention & Avoidance activities,
7. Scouting plan & threshold levels for each pest,

8. When warranted, additional monitoring plans for prevention when pesticides are applied.
9. Method for record keeping.

IPM Record Keeping

All applicable records must be kept for at least three years or longer if required by local, state, or federal regulations and include:

- Monitoring or scouting results including the date, pest population / degree of infestation, and the crop or plant community condition.
- When & where each pest suppression technique was implemented.
- When & where special IPM techniques were implemented to mitigate site-specific risks (i.e. soil incorporation of a pesticide to reduce its surface runoff to a nearby stream.).
- Pests being treated, pesticides applied, sketch or map of area being treated, and all pesticide applications (NE-CPA-29 or NE-CPA-39).

Restricted Use Pesticide Record Keeping

In addition to the above, restricted use pesticide application records include the following and any additional records required by federal, state or local laws and regulations for pesticide application.

- Brand/product name
- EPA registration number
- Total amount of RUP applied
- Crop/site treated
- Field location
- Acres treated
- Application date
- Name of certified applicator
- Certification number

Operation, maintenance, and safety

Maintain records of pest management for at least three years.

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

Maintain mitigation techniques identified in the plan in order to ensure continued effectiveness.

Develop a safety plan for individuals exposed to chemicals, including telephone numbers & websites of emergency treatment centers; and the telephone number for the nearest poison control center (See Table III, NE Tech Note 110).

Pesticide applications shall follow label instructions and UNL recommendations.

Replace worn nozzle tips, cracked hoses, and faulty gauges.

Calibrate application equipment according to UNL Extension guidelines and/or manufacturer recommendations before each seasonal use and with each major chemical change.

Additional O&M, Safety for Pesticide Use

All pesticide users are encouraged to obtain training to become certified in pesticide application even if they do not apply restricted use pesticides.

Pesticide labels have signal words indicating how toxic they are to humans:

“Danger/Poison” skull and cross bones appear on labels of pesticides considered highly toxic.

“Warning” appears on labels of pesticides that are moderately toxic.

“Caution” appears on labels of pesticides that are slightly toxic to relatively non-toxic.

Maintain appropriate Material Safety Data Sheets (MSDS).

www.greenbook.net/

[search/QuickSearch/](#)

Pay special attention to all environmental hazards and site-specific application criteria listed on pesticide labels and contained in Extension and crop consultant recommendations.

Follow label requirements for mixing/ loading and application setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, or reservoirs.

When adding water to spray tanks, keep air space between water supply hose and spray tank to prevent back-siphoning of pesticide mixture into water supply. Always monitor the filling of spray tanks to prevent overflows or back-siphoning.

Applications made through irrigation systems will follow state and local laws and regulations including chemigation requirements administered by the Natural Resources District (NRD).

When chemigating, users must obtain necessary permits from the local NRD. All chemigation systems must be equipped with the appropriate safety equipment to prevent backflow of chemicals into the water source.

Pesticides used in chemigation shall be labeled for this method of application.

Accurately measure and mix all pesticides. Mix only the amount

needed to eliminate storing and disposing of excess. Triple rinse pesticide containers and empty the water used to rinse pesticide containers into the spray tank.

Post signs around sites that have been treated and pesticide storage areas according to label directions and/or Federal, State, and local laws. Follow restricted entry intervals after application.

Pesticides shall be stored in original labeled containers according to label requirements.

Dispose of leftover pesticides and container according to label requirements and never reuse them for other purposes. Consider recycling containers at pesticide waste collection sites.

Return unopened pesticides to the supplier.

All pesticide application records shall be in accordance with Nebraska Department of Agriculture (NDA) and USDA Agricultural Marketing Service’s Pesticide Record Keeping Program.

For more information refer to NRCS Nebraska Field Office Technical Guide (eFOTG) Section IV, Conservation Practice Standard—Integrated Pest Management, (595) at http://efotg.nrcs.usda.gov/efotg_locator.aspx?map=NE, or visit your local NRCS office.

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