ATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

PEST MANAGEMENT

(Acre)

CODE 595

DEFINITION

Utilizing environmentally sensitive prevention, avoidance, monitoring and suppression strategies, to manage weeds, insects, diseases, animals and other organisms (including invasive and non-invasive species), that directly or indirectly cause damage or annoyance.

PURPOSES

This practice is applied as part of a Resource Management System (RMS) to support one or more of the following purposes:

- Enhance quantity and quality of commodities.
- Minimize negative impacts of pest control on soil resources, water resources, air resources, plant resources, animal resources and/or humans.

CONDITIONS WHERE PRACTICE APPLIES

Wherever pests will be managed.

CRITERIA

General Criteria Applicable to All Purposes

All methods of pest management must comply with Federal, State, and local regulations, including management plans for invasive pest species, noxious weeds and disease vectors.

The **Oklahoma Combined Pesticide Laws and Rules** can be accessed at the following website:

http://www.oda.state.ok.us/laws-home.htm

All individuals who approve plans for pest management shall be certified according to NRCS General Manual 180, Part 409.

Integrated Pest Management (IPM) is a sustainable approach to pest control. IPM suppression systems include biological, cultural, mechanical, and the judicious use of chemical control measures. IPM principles are contained in **Appendix 1**.

Integrated Pest Management (IPM) practices established by Oklahoma State University (OSU) shall be utilized. Information on IPM and available crops can be obtained at the OSU IPM website:

http://www.ento.okstate.edu/IPM/ipm_teams.html

If crop-specific IPM strategies are not available, the following general IPM strategies will be used to reduce pest populations below economic injury levels and to minimize pest resistance and adverse effects of pesticides on human health and the environment.

- **Prevention –** is the practice of keeping pest populations from infesting a crop or field and is the first line of defense for pest control.
- **Avoidance –** is practiced when pest populations exist but the impact of the pest on the crop can be avoided.
- **Monitoring** – tracking and identifying pests through surveys or scouting programs.
- **Suppression** – managing pest populations using cultural, biological, mechanical, and/or the judicious use of chemical practices.

The above components are combined to be called **PAMS**. **Appendix 2** contains biological, cultural, and mechanical practices which can be used in the development of the overall IPM plan. IPM strategies will include Field Scouting and Economic Thresholds when insects are the pest of concern and when available for crops and pests.

Chemical pesticide applications will be made according to OSU recommendations and the Oklahoma NRCS Brush Management (314) standard and specification. OSU pesticide recommendations can be found in the current OSU Extension Agents Handbook, OSU Factsheets, and the OSU Pesticide Economic and Environmental Tradeoffs (PEET) website.

http://www.weedscience.okstate.edu/Weeds/PEETWeeds.htm

All pesticide recommendations shall be made within label instructions and precautionary statements to limit environmental risks.

OSU Pesticide Safety Program
http://pested.okstate.edu

The **Oklahoma Mesonet** website is available for weather information and pest models. It can be accessed at the following website.

http://agweather.mesonet.org

The following websites are available for pest identifications.

OSU Weed ID:
http://www.weedscience.okstate.edu/Weeds/PEETWeeds.htm

USDA Plants ID Database:
http://plants.usda.gov

OSU Plant Pathology and Entomology:
http://www.entoplp.okstate.edu

Noble Foundation Plant ID Database
http://www.noble.org/imagegallery/index.html

Additional Criteria to Protect Quantity and Quality of Commodities

IPM principles will be used to determine minimum levels of pest control necessary to meet pest management objectives for crops.

Additional Criteria to Protect Soil Resources

In conjunction with other conservation practices, the number, sequence and timing of tillage operations shall be managed to maintain soil quality and soil loss at or below the soil loss tolerance (T) or any other planned soil loss objective using the current NRCS erosion prediction technology.

The Soil Condition Index (SCI) will be used to monitor soil organic matter trends if required.

Pesticide label instructions will be followed to limit pesticide residues in the soil that may negatively impact non-target species.

Additional Criteria to Protect Water Resources

Pest management environmental risks, including the impacts of pesticides in ground and surface water on humans and non-target plants and animals, must be evaluated for all water resource concerns.

Risk Assessment

The NRCS Windows Pesticide Screening Tool (WIN-PST) will be used to develop the risk assessment.

A risk assessment of fields being treated with any of the pesticides listed in **Table 1** will be developed where permanent water tables are within 6 feet of the soil surface, for soils having a hydrologic group A designation, where field slopes are over 8%, where drainage tile is used, or when the field is within 100 feet of permanent surface water bodies, perennial streams, irrigation channels, wells, sinkholes or any other sensitive area.

The pesticides listed in Table 1 are mostly Restricted Use Pesticides (RUP) with very few exceptions.

WIN-PST will provide a hazard rating for humans and fish of ‘Extra High’, ‘High’, ‘Intermediate’, ‘Low’, and ‘Very Low’.

Mitigation

When a chosen Restricted Use Pesticide alternative has a soil/pesticide interaction hazard rating on humans or fish from WIN-PST of ‘Extra High’, ‘High’, or ‘Intermediate’, an appropriate set of mitigation practices will be planned to reduce the environmental risks of pest management activities. Hazard ratings of ‘Low’ or ‘Very Low’ will not require mitigation practices but are encouraged.

Table 2, “Mitigation Effectiveness Guide - Reducing Pesticide Impacts on Water Quality” contains a list of management and conservation practices which can mitigate adverse effects of pesticides depending upon pesticide loss pathways (Leaching, Solution Runoff, and Adsorption Runoff). Each practice

has been given a relative effectiveness rating by pesticide loss pathway of 'NA' not applicable, 'slight effect' (+/-), 'moderate effect' (++/--), and 'significant effect' (+++/---).

A WIN-PST hazard rating of 'High' will require a minimum of one mitigation management practice and one conservation practice with minimum effectiveness ratings of 'moderate effect' (++) for the pesticide loss pathway of concern.

A WIN-PST hazard rating of 'Intermediate' will require a minimum of one mitigation management practice and one conservation practice with minimum effectiveness ratings of 'slight effect' (+) for the pesticide loss pathway of concern.

A WIN-PST hazard rating of 'Extra High' will require a minimum of one mitigation management practice and one conservation practice with minimum effectiveness ratings of 'significant effect' (+++) for the pesticide loss pathway of concern. 'Extra High' hazard ratings may not be sufficiently mitigated even with all available mitigation techniques and should be used only when there is no other alternative available.

Combinations of mitigation techniques are encouraged and desirable to maximize the reduction of environmental risks.

All methods of pest management will be integrated with other components of the conservation plan.

Follow specific pesticide label instructions for limiting pesticide residues that may negatively impact water quality and:

- Check label for restriction of pesticide use over or around water supplies.
- Provide areas for filling, mixing, and cleaning equipment that will contain pesticide residues from reaching not-targeted areas.
- When using a pond or well for a source of water, move 50 to 100 feet down slope from the source. Do not allow back siphonage to occur during use. Do not allow the tank to over fill.
- Manage the number, sequence and timing of tillage operations in conjunction with other sediment control tactics and practices, in order to minimize sediment losses to nearby surface water bodies.

Additional Criteria to Protect Air Resources

Follow specific pesticide label instructions for preventing negative effects on air quality and:

- Apply pesticides using appropriate nozzle type, size, and pressure to optimize droplets size and minimize drift.
- Apply pesticides when wind velocities and air temperature are optimum to reduce volatilization and drift.

Additional Criteria to Protect Plant Resources

Follow specific pesticide label instructions for preventing negative effects on plants and:

- Keep pesticide applications directed in the targeted area.
- Clean spray equipment before moving to the next field or crop.
- Apply pesticides under proper climatic conditions, crop stage, soil moisture, pH, soil depth for incorporation, and organic matter in order to protect plant health.
- Follow the recommended label rotational intervals (plant back restrictions) to avoid injury to subsequent crops in rotation.
- Follow label restrictions when making tank mixes of pesticides and fertilizers.
- Follow label restrictions when adding spray additives or carriers to pesticide mix.
- Maintain good, healthy plant growth using proper nutrient management.

Additional Criteria to Protect Animal Resources

Follow specific pesticide label instructions that minimize negative impacts to animals and:

- Select pesticides that are least toxic to non-target animals including insects (parasitic, honey bees, etc.).
- Make sure pesticide treated seed is not available to animals.
- Check for locations of Threatened and Endangered Species. A list and location of Threatened and Endangered Species in

Oklahoma can be obtained at the following website:

http://www.nrcs.usda.gov/technical/efotg/

Additional Criteria to Protect Humans

Follow pesticide label instructions that minimize negative impacts to humans and:

- Follow posting and field re-entry restrictions.
- Wear appropriate protective clothing and equipment as specified.
- Store pesticides properly.
- Rinse and dispose of containers accordingly.
- Follow label instructions in case of accidental exposure. Provide adequate first aid equipment such as plastic eyewash bottles, water, and detergent for washing off splashes or spills.

PLANS AND SPECIFICATIONS

The pest management component of a conservation 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(s).

As a minimum, the pest management component of a conservation plan shall include:

- Plan map and soil map of the managed site.
- Location of sensitive resources and setbacks.
- IPM strategies by crop
- WIN-PST environmental risk analysis for selected pesticide alternatives by crop and pest when needed according to this standard.
- Interpretation of the environmental risk analysis and identification of appropriate mitigation techniques as needed.
- Operation and maintenance requirements.
- The Integrated Pest/Brush Management form OK-CPA-16 will be used to document the pest management practice.

OPERATION AND MAINTENANCE

The pest management component of a conservation plan shall include appropriate operation and maintenance items for the client. These may include:

- Review and update the pest management plan periodically in order to incorporate new IPM technology, respond to cropping system and pest 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 and addresses of emergency treatment centers for individuals exposed to chemicals and the telephone number for the nearest poison control center.

  The Oklahoma Poison Control Center telephone number is:

  1-800-222-1222

  The Oklahoma Poison Control Center website also contains information for non-emergency cases:

  http://www.oklahomapoison.org/

  The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon for non-emergency information is:

  1-800-858-7384

  Monday - Friday
  6:30 a.m. to 4:30 p.m. Pacific Time

- All uncontained emergency spills in Oklahoma of more than ten (10) gallons liquid or twenty-five (25) pounds dry weight of pesticide concentrate or fifty (50) gallons of an application mixture (tank mix) shall be reported by a commercial applicator within 24 hours by telephone and by written notice within three (3) days to:

  (405-702-5100)
  Waste Management
  Oklahoma Department of Environmental Quality
  P.O. Box 1677
  Oklahoma City, Oklahoma 73101-1677

  and

(405-203-5180)
Pest Management Section
Oklahoma Department of Agriculture, Food and Forestry
2800 N. Lincoln Blvd.
Oklahoma City, Oklahoma 73152

The national 24-hour CHEMTREC telephone number for emergency spills is:

1-800-424-9300

- Follow label requirements for mixing/loading setbacks from wells, intermittent streams and rivers, natural or impounded ponds and lakes, or reservoirs.
- Post signs according to label directions around sites that have been treated. Follow restricted entry intervals.
- Dispose of pesticides and pesticide containers in accordance with label directions and adhere to Federal, State, and local regulations. **Oklahoma Combined Pesticide Laws and Rules for disposing of pesticides can be obtained on the following website:**

  http://www.oda.state.ok.us/laws-home.htm
- Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS).
- Calibrate application equipment according to the OSU Extension Agent's Handbook and/or the manufacturer recommendations before each seasonal use and with each major chemical change.
- Use regularly scheduled maintenance on equipment and replace worn nozzle tips, cracked hoses, and faulty gauges.
- Maintain records of pest management for at least two years. Pesticide application records shall be in accordance with USDA Agricultural Marketing Service's Pesticide Record Keeping Program.
- Certified applicators in Oklahoma must keep the following records:

1. Time of application.
2. Place of each application.
3. Name and address of the applicator.
4. Name and address of person for who applied.
5. Legal description of the land where applied:
   - May be a street address when properly marked.
   - Shall not be a Post Office Box address.
6. Date of application.
7. Pesticide tank mix concentration.
8. Dilution rate for mixing.
9. Total quantity of pesticide used:
   - Total amount of pesticide concentrate used.
   - Total amount of pesticide tank mix used.
10. Complete trade name of pesticide product used.
11. EPA registration number of pesticide product used.
12. EPA establishment number of pesticide product used.
13. Any lot or batch number appearing on the pesticide product used.
14. Target pest for the application.
15. Site where the pesticide was applied.
16. Restricted Entry Interval as stated on the product label.
17. A copy of the pesticide product label as it appears on the container.
18. Copies of any contracts issued.
19. Other information as required by the Board.

APPENDIX 1

INTEGRATED PEST MANAGEMENT

(This appendix was adapted from Module 3 of Nutrient and Pest Management Considerations in a Conservation Management System Plan, NRCS National Employee Development Center self-paced study course, 1999.)

Integrated pest management is an approach to pest control that combines biological, cultural, mechanical, and other alternatives to chemical control with the judicious use of pesticides. The objective of IPM is to maintain pest levels below an economic injury level (Economic Threshold) while minimizing harmful effects of pest control on human health and environmental resources. Economic thresholds for some crops and/or pests are not currently known. Attempts to control one pest species without regard for the entire ecosystem can disrupt checks and balances between crop plants, pests, beneficials, and the physical environment.

Integrated pest management (IPM) depends on a detailed understanding of pests' natural enemies and crop growth and development, and in particular, what causes outbreaks and determines survival.

IPM strives for maximum use of naturally occurring control forces in the pest's environment including weather, pest diseases, predators, and parasites.

With IPM, the role for chemical pesticides is one of last resort if other alternatives fail to correct the problem. Foliar applied pesticides are rarely applied according to a pre-set schedule or spray calendar in an IPM program. Instead, they only are used if scouting shows they really are needed to prevent severe damage.

Prescriptive IPM depends largely on judicious use of pesticides based on field scouting that shows pest infestation has exceeded economic thresholds.

IPM Principles

Principle #1. There is no silver bullet, use several complimentary control practices to increase the long term stability of the production system.
Over reliance on any single control measure can have undesirable effects. This especially has been documented for pesticides where over-reliance can lead to the "3-R's": resistance, resurgence, and replacement. IPM considers all possible control actions, including taking no action at all, and fits tactics together into mutually complementary strategies. The idea is to combine different control tactics into an overall strategy that balances the strengths of each against any individual weaknesses.

Principle #2. Tolerate low numbers of pests.
IPM recognizes that keeping fields entirely pest-free is neither necessary nor desirable; it is not necessary to totally eliminate pests and, in fact, low levels of pest help maintain a predator population. Because most crops can tolerate low pest infestation levels without any loss in harvestable produce or quality, the presence of a pest does not necessarily mean that you have a pest problem. IPM seeks to reduce pest populations below levels that are economically damaging rather than to totally eliminate infestations.

Principle #3. Treat the causes of pest outbreaks, not the symptoms.
IPM requires detailed understanding of pest biology and ecology so that the cropping system can be manipulated to the pest's disadvantage. The idea is to make the crop less favorable for pest survival and reproduction with as little disturbance to the rest of the ecosystem as possible.

Principle #4. If you kill the natural enemies, you inherit their job.
Naturally occurring predators, parasites, pathogens, antagonists, and competitors (collectively known as biological control agents) help keep many pest populations in check. IPM strives to enhance the impact of beneficials and other natural controls by conserving or augmenting those agents already present.

Principle #5. Pesticides are not a substitute for good farming.
A vigorously growing plant can better defend itself against pests than a weak, stressed plant. IPM takes maximum advantage of farming practices that promote plant health and allow crops to escape or tolerate pest injury. IPM begins from the premise that killing pests is not the objective;

protecting the commodity is. Pest status can be reduced by repelling the pest, avoiding the pest, or reducing its rate of colonization or invasion, as well as by directly killing the pest.

Dependence on Pesticides

When a pest control program is based totally on the use of pesticides, adverse consequences of Resistance, Resurgence, and Replacement (pesticide treadmill) can become more common.

Resistance is the innate (genetically inherited) ability of organisms to evolve or select for strains that can survive exposure to pesticides formerly lethal to earlier generations. Resistance can develop when pesticides kill susceptible individuals while allowing naturally resistant individuals to survive. These survivors pass to their offspring the genetically determined resistance trait. With repeated pesticide application, the pest population increasingly is comprised of resistant individuals.

In theory, pests can develop resistance to any type of IPM tactic: biological, cultural, or chemical.

In the Midwest, farmers routinely rotate corn with soybeans to break the infestation cycle of the corn rootworm, an insect that only feeds on grassy plants and so has become the key insect pest of field corn. Yet the rootworm has developed strains that overcome crop rotation by extending their overwintering resting stage in the soil from one winter to several winters. This allows them to be ready to attack corn the next time it is planted in the field.

Still other rootworm populations have developed strains that feed on both corn and soybeans.

In practice, resistance occurs most frequently in response to pesticide use. Insects were the first group of pests to develop pesticide resistant strains. Worldwide, over 600 species are resistant to at least one insecticide; some are resistant to all the major classes of insecticides. Herbicide resistant weeds now number more than 100 worldwide and fungicide resistant plant pathogens have also been observed.

Resurgence of pests occurs when insecticide applications initially reduces an infestation, but soon after, the pest rebounds (resurges) to higher population levels than before treatment.

Replacement or secondary pest outbreak is resurgence of nontarget pests. It occurs when a pesticide is used to control the target pest, but afterwards a formerly insignificant pest replaces the target pest as an economic problem.

Components of the IPM Strategy

Field Scouting (Monitoring)

One principle of IPM is that pesticides should be used only when field examination or scouting shows infestations exceed economic thresholds, guidelines that differentiate economically insignificant infestations from intolerable populations. Pest scouting should be conducted in each individual field and generally should be random and representative.

The field examination or scouting must provide quantifiable pest/damage counts that can be used in making the management decisions for each individual field.

The only time to take control action and apply pesticides is when pest density reaches levels near the economic threshold (ET) value.

Pesticide application here keeps infestations from increasing beyond the breakeven economic injury level (EIL) value.

Cultural Methods

Cultural methods are those farming practices that control pests by breaking their infestation cycle by making the living and non-living environment less suitable for pest survival.

Cultural methods achieve these goals in 4 basic ways by:

- Reducing the overall favorableness of the habitat (by destroying pest over-wintering sites and other infestation sources both in the crop field and alternate hosts or habitats)
- Altering planting patterns to disrupt or interrupt in time and space the food or other habitat resources required by the pest
- Diverting mobile pests from the crop
- Enhancing the vigor of the crop so that it can better tolerate pest injury

Examples of cultural methods used in the IPM programs include:

Crop Rotation – alternate unrelated crops in the same field each season to break pest life cycles.

Adjust Planting or Harvesting Dates - alter planting and harvest dates to avoid pest infestations.

Adjust Seeding Rates - increase seeding rates and/or decrease crop row spacing to compete with potential weed problems.

Promote Plant Vigor – provide proper seedbed preparation, fertilizer application, and irrigation water scheduling that maintain plant vigor to help plants outgrow pests. Use seed that has been germination tested and free of pathogens to insure correct plant population (certified seed when available).

Avoid Problem Areas – avoid planting in parts of the field where pest populations will cause crop failure.

Eliminate Alternate Hosts – eliminate hosts or potential hosts that may harbor pests.

Sanitation Practices - clean tillage and harvesting equipment between fields and/or crops.

Plant Trap or Host Crops – use crops that attract and concentrate pest populations in a small portion of the field where they can be easily killed with minimal or even no pesticide or plant crops that provide habitats adjacent to the field for natural enemies.

Grazing and Burning Management – use grazing and forage management plans that promote grass vigor.

Mechanical Methods

The following are examples of mechanical methods used in IPM:

Mechanical Treatments – use cultivation, mowing, hand hoeing, hand picking, or spot treating to suppress pests.

Tillage System – use operations that turn the soil and bury crop residues to disrupt pathogens that winter in the soil or below crop residues. This can also apply to maintaining adequate cover on the soil surface to disrupt the habitat or life cycle of pests.

Biological Methods

Biological controls use living organisms (natural enemies) to suppress populations of other pests. Conserving naturally occurring parasites and predators are usually the most effective method of biological control.

Examples of biological methods in the IPM programs include:

Pest Resistant Varieties - tolerate pest injury, are less attractive to pests, or control pests by producing chemicals that are toxic to them.

Predators - are free-living animals (most often other insects or arthropods, but also birds, reptiles, and mammals) that eat other animals.

Parasitoids - are insect (or related arthropods) parasites of other insects (or other arthropods). Most parasitoids are tiny wasps and flies. They differ zoologically from true parasites (fleas, lice, or intestinal tapeworms) primarily in that parasitoids kill their host whereas parasites weaken, but seldom kill the host.

Pathogens - are disease causing micro-organisms including viruses, bacteria, fungi, and nematodes. They provide natural control of insects, plants, and even other micro-organisms.

Chemical Methods

The final component of IPM is selection of pesticides that are cost effective, least disruptive to the ecosystem and pose the least risk of leaching through soil or being transported from fields in runoff water and sediment or drifting as spray particles on the wind.

Pesticides are defined as "any substance used for controlling, preventing, destroying, repelling, or mitigating any pest." The three most common pesticide classes are herbicides, insecticides, and fungicides.

Herbicides, insecticides, and fungicides represent more than 93 percent of the pesticide active ingredient used worldwide. Herbicides typically represent more than 50 percent of pesticide use, followed by insecticides (23 to 35 percent), and fungicides (11 to 14 percent).

Putting IPM to Practice

The IPM philosophy can be put into practice by following these three steps:

Step 1. Use cultural methods, biological methods, mechanical methods, and other alternatives to conventional chemical pesticides as the basis of the IPM program.

Step 2. Use quantifiable field scouting, pest forecasting, and economic thresholds to ensure that pesticides are used only when there are real pest problems.

Step 3. Select pesticides that are efficacious, cost effective and least likely to disrupt natural and biological controls. Match pesticides with field site features so that the risk of contaminating water is minimized.

APPENDIX 2
Integrated Pest Management Practices and Pest Targets

Monitoring	Insects	Weeds	Diseases	Brush
1. *Use economic threshold to determine when suppression methods are needed (when available)	X	X		
2. *Scout field and keep records - Identify pests, monitor crop development and weather. Keep records of pesticide applications	X	X	X	X
3. Use traps, sticky cards and/or soil sampling to monitor pests	X			

Prevention	Insects	Weeds	Diseases	Brush
1. Clean tillage and harvesting equipment between fields and crops	X	X	X	
2. Use tillage to bury residues and disrupt wintering environments	X		X	
3. Promote plant vigor using proper seedbed preparation, irrigation scheduling, nutrient management and clean, tested, pest free seed.	X	X	X	
4. Eliminate alternate hosts	X		X	
5. Use a tillage system that leaves adequate residues on the surface after planting	X	X		
6. Use a prescribed grazing or forage harvest management plan.		X		X

Avoidance	Insects	Weeds	Diseases	Brush
1. Use pest resistant or pest tolerant varieties or seed with biological insect resistance.	X		X	
2. Use crop rotations to break pest life cycles.	X	X	X	
3. Adjust planting and/or harvesting dates to reduce pest injury or select cultivars that have earlier or later planting or harvesting dates.	X	X	X	
4. Increase seeding rate and/or decrease row spacings for better canopy cover		X		
5. Avoid planting in parts of field where pest populations will cause crop failure.	X	X	X	

Suppression	Insects	Weeds	Diseases	Brush
1. Use biological treatments (parasitoids, predators, goats, pathogens, GMOs, etc)	X	X		X
2. Mechanically cultivate, hand hoe, hand pick, or spot treat to suppress pests	X	X	X	X
3. Provide alternative crops or habitats adjacent to the primary crop for natural enemies	X			
4. Use burning or mowing for suppression		X		X
5. Use trap crops to attract pests where they can be easily suppressed	X			

***Essential components when insects are the pest of concern.**

TABLE 1
PESTICIDE LIST for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
AGRI-MEK 0.15 EC MITICIDE/INSECTICIDE	Abamectin (ANSI)	10000898	similar to Proclaim	In: Mi:	Veg
AMBUSH 25W INSECTICIDE	Permethrin, mixed cis,trans (ANSI)	10000988		In: PP, PPI,.	Alf, Veg, Corn,Sb
AMMO 2.5 EC INSECTICIDE	Cypermethrin (ANSI)	27903027	similar to Fury & Mustang	In:	Veg, Cot
AMVAC BIDRIN 8 WATER MISCIBLE INSECTICIDE	Dicrotophos	548100448		In:	Cot
ATRAZINE 4L (AATREX 4L)	Atrazine (ANSI)	274900336		Hb: PP, PPI, PreEM, PostEM	NG, Corn, Sorg, Sc, Fa
ATRAZINE 90 (AATREX NINE-0)	Atrazine (ANSI)	6271900313		Hb: PP, PPI, PreEM, PostEM	NG, Corn, Sorg, Sc, Fa
ATRAZINE 90 DF HERBICIDE	Atrazine (ANSI)	5963900106		Hb: PP, PPI, PreEM, PostEM	NG, Corn, Sorg, Sc, Fa
AZTEC 2.1% G	Cyfluthrin	312500539		In:	Corn
AZTEC 2.1% G	Phostebupirim	312500539		In:	Corn
AZTEC 4.67% GRANULAR	Cyfluthrin	312500513		In:	Corn
AZTEC 4.67% GRANULAR	Phostebupirim	312500513		In:	Corn
BALANCE 4SC HERBICIDE	Isoxaflutole	26400600		Hb: PP, PPI, PreEM	Corn
BALANCE HERBICIDE	Isoxaflutole	26400567		Hb: PP, PPI, PreEM	Corn
BASIS GOLD HERBICIDE	Atrazine (ANSI)	35200585		Hb: PostEM	Corn
BASIS GOLD HERBICIDE	Nicosulfuron (ANSI)	35200585		Hb: PostEM	Corn
BASIS GOLD HERBICIDE	Rimsulfuron (ANSI)	35200585		Hb: PostEM	Corn
BAYTHROID 2 EMULSIFIABLE PYRETHROID INSECTICIDE	Cyfluthrin	312500351		In:	Cot, Sorg, Veg
BICEP II MAGNUM HERBICIDE	Atrazine (ANSI)	10000817	similar to Lumax which also contains mesotrione	Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
BICEP II MAGNUM HERBICIDE	S-Metolachlor (ISO Approved common name)	10000817	similar to Lumax which also contains mesotrione	Hb: PP, PPI, PreEM, PostEM	Corn, Sorg

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
BICEP LITE II MAGNUM HERBICIDE	Atrazine (ANSI)	10000827		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
BICEP LITE II MAGNUM HERBICIDE	S-Metolachlor (ISO Approved common name)	10000827		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
BRONATE HERBICIDE	Bromoxynil octanoate	26400438		Hb: PostEm	Wh, Sorg, Corn
BUCTRIL + ATRAZINE HERBICIDE	Atrazine (ANSI)	26400477		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
BUCTRIL + ATRAZINE HERBICIDE	Bromoxynil octanoate	26400477		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
BULLET HERBICIDE	Alachlor (ANSI)	52400418		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
BULLET HERBICIDE	Atrazine (ANSI)	52400418		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
CAPTURE 1.15 BIFENTHRIN	Bifenthrin (ANSI)	27903244	similar to Empower	In:	Corn
CAPTURE 2 EC INSECTICIDE/MITICIDE	Bifenthrin (ANSI)	27903069	similar to Double Threat	In: Mi:	Veg, Corn, Cot, Sb
CAPTURE 2EC-CAL INSECTICIDE/MITICIDE	Bifenthrin (ANSI)	27903114	similar to Double Threat	In: Mi:	Veg, Corn, Cot, Sb
CHEMINOVA ETHYL METHYL PARATHION 6-3 EC	Methyl parathion	6776000039		In:	Alf, Corn, Cot, Sb, Wh
CHEMINOVA ETHYL METHYL PARATHION 6-3 EC	Parathion (ANSI)	6776000039		In:	Alf, Corn, Cot, Sb, Wh
CHEMINOVA METHYL PARATHION 4 EC	Methyl parathion	6776000043		In:	Alf, Corn, Cot, Rice, Sb, Wh
CLEAN CROP SNIPER 2-E AZINPHOS METHYL INSECTICIDE	Azinphos-Methyl	3470400691		In:	Veg, Cot
COMITE II	Proparite	40000154		In:	Corn
COMITE AGRICULTURAL MITICIDE	Proparite	40000104		In:	Corn

TABLE 1 (Cont.) Pesticide List for WIN-PST					
PROD_NAME 1/	**AI_NAME 2/**	**REG_NO 3/**	**Other Prod Names 4/**	**Type/Use 5/**	**Crop(s) 6/**
CURACRON 8E INSECTICIDE-MITICIDE	Profenofos (ANSI)	10000669		In: Mi:	Cot
CYGON 2-E SYSTEMIC INSECTICIDE	Dimethoate	138600449		In:	SG
CYGON 2-E SYSTEMIC INSECTICIDE	Dimethoate	239300377		In:	SG
CYGON 400 SYSTEMIC INSECTICIDE - MITICIDE	Dimethoate	239500520		In:	SG
CYCLONE CONCENTRATE/GRAMOXONE MAX	Paraquat dichloride	10001074		Hb: PP, PPI, PreEM, PostEM; Def: Des: HA: PGR:	Veg, Corn, Cot, Pnut, Rice, Sorg, Sb, Wh
DANITOL 2.4 EC SPRAY	Fenpropathrin (ANSI)	5963900035		In: Mi:	Cot, Veg, Pnut,
DECIS 0.2 EC	Deltamethrin	3414700008		In: Mi:	Cot
DECIS 1.5 EC INSECTICIDE	Deltamethrin	3414700012		In: Mi:	Cot
DECLARE or PENNCAP-M MICROENCAPSULATED INSECTICCIDE	Methyl parathion Methyl parathion	181200432 458100393		In: Mi:	Alf, Corn, Cot, Rice, Range, Sb, Wh
DEGREE	Acetochlor (ANSI)	52400496		Hb: PP, PPI, PreEM, PostEM	Corn
DEGREE Xtra	Acetochlor (ANSI)	52400511		Hb: PP, PPI, PreEM, PostEM	Corn
DEGREE Xtra	Atrazine (ANSI)	52400511		Hb: PP, PPI, PreEM, PostEM	Corn
DI - SYSTON 8	Disulfoton	312500307		In: Mi:	Veg, Cot, Sorg, Wh
DIAZINON 500-AG	Diazinon (ANSI)	3470400231		In: Mi:	Veg
DIAZINON 50W	Diazinon (ANSI)	5103600108		In: Mi:	Veg

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
DIAZINON AG 500	Diazinon (ANSI)	5103600071		In: Mi:	Veg
DIAZINON G-14	Diazinon (ANSI)	3470400230		In:	
DIMILIN 25W FOR COTTON/SOYBEAN	Diflubenzuron (ANSI)	40000465		Lar: IGR:	Cot, Pasture, Range, Sb
DIMILIN 2L	Diflubenzuron (ANSI)	40000461		IGR: Ov:	Cot, Nut, Pasture, Range, Rice, Sb
DI-SYSTON 15%	Disulfoton	312500172		In: Mi:	Veg, Cot, Pnut, Sb, Sorg, Wh
DOUBLEPLAY SELECTIVE HERBICIDE	Acetochlor (ANSI)	10001083		Hb: PP, PPI,	Corn
DOUBLEPLAY SELECTIVE HERBICIDE	EPTC	10001083		Hb: PP, PPI,	Corn
DUPONT ASANA XL INSECTICIDE	Esfenvalerate	35200515		In: Ov:	Corn, Cot, Pnut, Sorg, Sb
DUPONT FORTRESS 2.5G GRANULAR INSECTICIDE	Chlorethoxyfos (ANSI)	548100494		In:	Corn
DUPONT FORTRESS 5G GRANULAR INSECTICIDE	Chlorethoxyfos (ANSI)	548100493		In:	Corn
DUPONT HYVAR X HERBICIDE	Bromacil	35200287	Many others	Hb:	
DUPONT LANNATE LV INSECTICIDE	Methomyl (ANSI)	35200384		In: Lar: Ov:	Alf, Veg, Bermuda, Corn, Cot, Pnut, Sorg, Wh
DUPONT LANNATE SP INSECTICIDE	Methomyl (ANSI)	35200342		In: Lar: Ov:	Alf, Veg, Bermuda, Corn, Cot, Wh, Pnut, Sorg, Sb

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
EPIC DF HERBICIDE	Isoxaflutole	312500522		Hb: PP, PPI, PreEM	Corn
EPIC DF HERBICIDE	Thiafluamide	312500522		Hb: PP, PPI, PreEM	Corn
ERADICANE 6.7-E	EPTC	10001026		Hb:	Corn
FIELD MASTURE	Acetochlor (ANSI)	52400497		Hb: PP, PPI, PreEM	Corn
FIELD MASTURE	Atrazine (ANSI)	52400497		Hb: PP, PPI, PreEM	Corn
FIELD MASTURE	Glyphosate, isopropylamine salt	52400497		Hb: PP, PPI, PreEM	Corn
FORCE 3G INSECTICIDE	Tefluthrin (ANSI)	10001075		In:	Corn
FREEDOM HERBICIDE	Alachlor (ANSI)	52400422		Hb: PP, PPI, PreEM	Sb
FREEDOM HERBICIDE	Trifluralin (ANSI)	52400422		Hb: PP, PPI, PreEM	Sb
FRONTIER 6.0 HERBICIDE	Dimethenamid	796900147		Hb:	Corn
FRONTIER HERBICIDE	Dimethenamid	796900144		Hb:	Corn
FURADAN 15 G INSECTICIDE NEMATICIDE	Carbofuran (ANSI)	27903023		In: Nem:	Veg
FURADAN 4F INSECTICIDE/NEMATICIDE	Carbofuran (ANSI)	27902876		In: Nem:	Alf, Corn, Cot, Sb, Sc, Wh
GRAMOXONE EXTRA HERBICIDE	Paraquat dichloride	10001043		Hb: PP, PPI, PreEM, PostEM; Des:	Veg, Corn, Cot, Pasture, Rice, Sorg, Sb, Wh
GRAMOXONE SUPER HERBICIDE	Paraquat dichloride	10001002		Hb: PP, PPI, PreEM, PostEM; Def: Des: HA: PGR:	Veg, Corn, Cot, Pasture, Rice, Sorg, Sb, Wh
GRAZON PC (also Grazon P+D)	Picloram, potassium salt	6271900181	Use for Grazon P+D	Hb: PostEM	Pasture, Range

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
GRIFFIN BOA HERBICIDE	Paraquat dichloride	181200420		Hb: PP, PPI, PreEM, PostEM; Def: Des: PGR:	Veg, Corn, Cot, Pnut, Rice, Sorg, Sb, Wh
GUARDSMAN HERBICIDE	Atrazine (ANSI)	796900146	similar to G-Max Lite & Leadoff	Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
GUARDSMAN HERBICIDE	Dimethenamid	796900146	similar to G-Max Lite & Leadoff	Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
GUARDSMAN MAX HERBICIDE	(S)-2-Chloro-N-{(1-methyl-2-methoxy)ethyl}-N-(2,4-dimethyl-thien-3-yl) acetamide	796900192		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
GUARDSMAN MAX HERBICIDE	Atrazine (ANSI)	796900192		Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
GUTHION 2L EMULSIFIABLE INSECTICIDE	Azinphos-Methyl	312500102		In: ACP:	Veg, Cot
GUTHION SOLUPAK 50% WETTABLE POWDER INSECTICIDE	Azinphos-Methyl	312500301		In: Mi: ACP:	Alf, Veg,
HARNESS	Acetochlor (ANSI)	52400473		Hb: PP, PPI, PreEM, PostEM	Corn
HARNESS 20 G HERBICIDE	Acetochlor (ANSI)	52400487		Hb: PP, PPI, PreEM	Corn
HARNESS XTRA HERBICIDE	Acetochlor (ANSI)	52400480		Hb: PP, PPI, PreEM, PostEM	Corn
HARNESS XTRA HERBICIDE	Atrazine (ANSI)	52400480		Hb: PP, PPI, PreEM, PostEM	Corn
HOELON 3EC HERBICIDE	Diclofop-methyl	26400641		Hb: PP, PPI, PreEM, PostEM	Wh
INLINE	1,3-Dichloropropene	6271900348		Fng: PP, PPI, Hb: PP, PPI, Nem: SF	Field Crops, Veg
INLINE	Chloropicrin	6271900348		Fng: PP, PPI, Hb: PP, PPI, Nem: SF	Field Crops, Veg

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
KARATE Z INSECTICIDE	lambda-Cyhalothrin	10001097	zoen technology	In:	Cot, Pnut, Rice, Sorg, Sb
KERB 50W HERBICIDE IN WSP	Propyzamide	6271900397		Hb: PP, PPI, PreEM, PostEM	Alf, Veg
LADDOK 5L ALDICARB PESTICIDE	Atrazine (ANSI)	6006300018		Hb:	Sorg
LADDOK 5L ALDICARB PESTICIDE	Sodium bentazon	6006300018		Hb:	Sorg
LARIAT HERBICIDE	Alachlor (ANSI)	52400329	similar to Keystone	Hb: PP, PPI, PreEM	Corn, Sorg
LARIAT HERBICIDE	Atrazine (ANSI)	52400329	similar to Keystone	Hb: PP, PPI, PreEM	Corn, Sorg
LARVIN BRAND 3.2 THIODICARB INSECTICIDE/OVICIDE	Thiodicarb (ANSI)	26400379		In: Ov:	Cot, Veg, Sb
LASSO HERBICIDE	Alachlor (ANSI)	52400314		Hb: PP, PPI, PreEM	Bean, Corn, Pnut, Sorg, Sb
LASSO II GRANULAR HERBICIDE BY MONSANTO	Alachlor (ANSI)	52400296		In:	Sb
LEGEND 2.7 SUSPENSION EMULSION INSECTICIDE	Cyfluthrin	312500524	similar to Leverage	In: Ov:	Cot
LEGEND 2.7 SUSPENSION EMULSION INSECTICIDE	Imidacloprid	312500524	similar to Leverage	In: Ov:	Cot
LIBERTY ATZ HERBICIDE	Atrazine (ANSI)	26400668		Hb: PostEM	Corn
LIBERTY ATZ HERBICIDE	Glufosinate-ammonium	26400668		Hb: PostEM	Corn
LOCK-ON	Chlorpyrifos (ANSI)	6271900079		In:	Alf, Cot
LORSBAN 4E-SG	Chlorpyrifos (ANSI)	6271900245		In:	Wh
LORSBAN-4E	Chlorpyrifos (ANSI)	6271900220		In: PP, PPI, Mi:	Alf, Veg, Corn, Cot, Pnut, Sorg, Sb, Wh

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
MARKSMAN HERBICIDE	Atrazine (ANSI)	796900136	similar to Banvel-K + Atrazine, & Streling Plus	Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
MARKSMAN HERBICIDE	Dicamba, potassium salt	796900136	similar to Banvel-K + Atrazine, & Streling Plus	Hb: PP, PPI, PreEM, PostEM	Corn, Sorg
MBC-33	Chloropicrin	885300003		In:	Veg
MBC-33	Methyl bromide	885300003		In:	Veg
MBC SOIL FUMIGANT	Methyl bromide	885300001		In:	Veg
MCPA (Many other products listed for this AI)	MCPA **or** MCPA, dimethylamine salt **or** MCPA, 2-ethylhexyl ester	Many listed		Hb:	
METASYSTOX-R SPRAY CONCENTRATE	Oxydemeton-methyl	1016300220		In: Mi:	Alf, Veg, Cot
MICRO-TECH HERBICIDE	Alachlor (ANSI)	52400344		Hb: PP, PPI, PreEM, PostEM	Bean, Corn, Pnut, Sorg, Sb
MOCAP 15% GRANULAR NEMATICIDE - INSECTICIDE	Ethoprop (ANSI)	26400457		In: Nem:	Veg, Corn, Pnut, Sc
MOCAP EC NEMATICIDE - INSECTICIDE	Ethoprop (ANSI)	26400458		In: Nem:	Veg, Corn, Pnut, Sc
MONITOR 4	Methamidophos (ANSI)	312500280		In: Mi:	Cot, Potato
MONITOR 4 SPRAY	Methamidophos (ANSI)	5963900056		In: Mi:	Cot, Potato
NEMACUR 15% GRANULAR	Fenamiphos	312500236		In: Mi: Nem:	Veg, Cot, Pnut
NEMACUR 3	Fenamiphos	312500283		In: Mi: Nem:	Veg, Cot, Pnut
NUFOS 4E	Chlorpyrifos (ANSI)	6776000028		In: PP, PPI,	Alf, Cot, Corn, Pnut, Sorg, Sb, Wh
ORBIT 45WP AGPAK / SUPER TIN 80WP AGPAK	Propiconazole	181200395		Fng:	Pecan
PARATHION 4 EC.	Parathion (ANSI)	6776000037		In:	Alf, Cot, Corn, Sorg, Sb, Wh
PARATHION 8 EC.	Parathion (ANSI)	6776000038		In:	Alf, Cot, Corn, Sorg, Sb, Wh

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
PERMIT	Halosulfuron-methyl	52400465		Hb:	Corn
PHASER 3EC INSECTICIDE	Endosulfan	26400638		In:	Cot
PHASER 50WSP INSECTICIDE	Endosulfan	26400656		In:	Cot
PHORATE 20-G	Phorate (ANSI)	977900293		In: Mi:	Cot, Corn, Pnut, Sorg, Sb, Sc
POUNCE 1.5G INSECTICIDE	Permethrin, mixed cis,trans (ANSI)	27903059		In: PP, PPI,	Corn
POUNCE 25 WP INSECTICIDE	Permethrin, mixed cis,trans (ANSI)	27903051		In: PP, PPI,	Alf, Corn, Veg
POUNCE 3.2 EC INSECTICIDE	Permethrin, mixed cis,trans (ANSI)	27903014	same as Artic	In: PP, PPI,	Alf, Corn, Veg
POUNCE WSB INSECTICIDE	Permethrin, mixed cis,trans (ANSI)	27903083		In: PP, PPI,	Alf, Corn, Veg
READY MASTER ATZ	Atrazine (ANSI)	52400509		Hb: PostEM	Corn, Fa
READY MASTER ATZ	Glyphosate, isopropylamine salt	52400509		Hb: PostEM	Corn, Fa
REFLEX HERBICIDE	Fomesafan sodium	10000993		Hb: PostEM	Sb
RESOURCE 80WP HERBICIDE	Flumiclorac-pentyl	5963900100		Hb:	Corn
RESOURCE HERBICIDE	Flumiclorac-pentyl	5963900082		Hb:	Corn
REGENT 1.5G INSECTICIDE	Fipronil	26400555		In:	Corn
REGENT 80WG INSECTICIDE	Fipronil	26400570		In:	Corn
REGENT 4SC INSECTICIDE	Fipronil	26400582		In:	Corn
SCOUT X-TRA INSECTICIDE	Tralmethrin	341470003		In:	Cot
SCOUT 0.3EC INSECTICIDE	Tralmethrin	341470004		In:	Cot
SCOUT INSECTICIDE	Tralmethrin	341470002		In:	Cot
SCOUT X-TRA GEL INSECTICIDE	Tralmethrin	341470011		In:	Cot
SENCOR 4 FLOWABLE	Metribuzin	312500314	Use for Lexone	Hb:	Sb
SENCOR 75% DRY FLOWABLE HERBICIDE	Metribuzin	312500325	Use for Lexone	Hb:	Sb

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
SHOTGUN FLOWABLE HERBICIDE	Acetic acid, (2,4-dichlorophenoxy)-, 2-ethylhexyl ester	3470400728		Hb: PP, PPI, PreEM, PostEM	NG, Corn, Sorg
SHOTGUN FLOWABLE HERBICIDE	Atrazine (ANSI)	3470400728		Hb: PP, PPI, PreEM, PostEM	Native Grass, Corn, Sorg
SILVERADO HERBICIDE	Fenoxaprop-p-Ethyl	26400650		Hb: PostEM	Wh
SUPRACIDE 25W	Methidathion (ANSI)	1016300244		In: Mi:	Veg, Cot
SUPRACIDE 2E INSECTICIDE-MITICIDE	Methidathion (ANSI)	1016300236		In: Mi:	Veg, Cot
SUREFIRE HERBICIDE	Diuron (ANSI)	10001010		Hb: PP, PPI, PreEM	Corn, Wh, Fa
SUREFIRE HERBICIDE	Paraquat dichloride	10001010		Hb: PP, PPI, PreEM	Corn, Wh, Fa
SURPASS 20-G GRANULAR HERBICIDE	Acetochlor (ANSI)	6271900370		Hb: PP, PPI, PreEM	Corn
SURPASS EC HERBICIDE	Acetochlor (ANSI)	6271900367		Hb: PP, PPI, PreEM, PostEM	Corn
TELONE C-17	1,3-Dichloropropene	6271900012		Fng: In: Nem: SF	Veg, Corn, Field Crops, Pnut,
TELONE C-17	Chloropicrin	6271900012		Fng: In: Nem: SF	
TELONE C-35	1,3-Dichloropropene	6271900302		Fng: In:	Veg, Pnut
TELONE C-35	Chloropicrin	6271900302		Fng: In:	Veg, Pnut
TELONE EC	1,3-Dichloropropene	6271900321		Fng: Nem: SF	Cot, Field Crops, Veg
TELONE II	1,3-Dichloropropene	6271900032		Fng: In: Nem: SF	Cot, Field Crops, Veg
TEMIK BRAND 15G ALDICARB PESTICIDE	Aldicarb (ANSI)	26400330		In: Mi: Nem:	Bean, Cot, Pecan, Pnut, Sorg, Sb, Sc

TABLE 1 (Cont.)
Pesticide List for WIN-PST

PROD_NAME 1/	AI_NAME 2/	REG_NO 3/	Other Prod Names 4/	Type/Use 5/	Crop(s) 6/
TERRACLOR 6.5% PLUS DI-SYSTON 6.5% GRANULAR	Disulfoton	40000411		Fng: In: Mi:	Cot
TERRACLOR 6.5% PLUS DI-SYSTON 6.5% GRANULAR	Pentachloronitrobenzene	40000411		Fng: In: Mi:	Cot
TERRACLOR SUPER X PLUS DI-SYSTON EC	Disulfoton	40000475		Fng: In: Mi:	Cot
TERRACLOR SUPER X PLUS DI-SYSTON EC	Etridiazole	40000475		Fng: In: Mi:	Cot
THIMET 20-G SOIL & SYSTEMIC INSECTICIDE	Phorate (ANSI)	24100257		In: Mi:	Bean, Corn, Cot, Pnut, Sorg, Sb, Sc
TOPNOTCH NO TILL HERBICIDE	Acetochlor (ANSI)	6271900369		Hb: PP, PPI, PreEM, PostEM	Corn
TORDON K	Picloram, potassium salt	6271900017		Hb:	
TORDON 22K_WEED KILLER	Picloram, potassium salt	627190006		Hb:	
VYDATE L INSECTICIDE/NEMATICIDE	Oxamyl (ANSI)	35200372		In: Mi: Nem: PGR	Veg, Cot, Pnut, Sb
WARRIOR INSECTICIDE WITH ZEON TECHNOLOGY	lambda-Cyhalothrin	10001112		In: Mi:	Alf, Veg, Corn, Cot, Pnut, Rice, Sorg, Sb, Wh
ZEPHYR 0.15 EC	Abamectin (ANSI)	10000897	similar to Proclaim	In: Mi:	Cot

Footnotes

1/ Product Name as shown in WIN-PST program.

2/ Active Ingredient as shown in WIN-PST program.

3/ EPA product registration number as shown in WIN-PST program.

4/ Other or similar products not in WIN-PST program. Select the listed product for WIN-PST calculations.

5/ General information on product type and application timing. This may vary according to soils, landscape, crop, etc., therefore check product label for specifics related to your situation.
Type abbreviations - ACP = Animal Control Product, Def = Defoliant, Des = Desiccant, Fng = Fungicide, IGR = Insect Growth Regulator, Hb = Herbicide, In = Insecticide, Mi = Miticide, Lar = Larvicide, Ov = Ovicide, SF = Soil Fumigant, HA = Harvest Aid, PGR = Plant Growth Regulator, Nem = Nematicide.

Use abbreviations - PP = Preplant, PPI = Preplant Incorporate, PreEM = Preemerge, PostEM = Post Emerge.

6/ Generalized and partial list of crops for each product. Again check product label for complete list crops and restrictions for your specific situation. Crop abbreviations – Alf = Alfalfa, Corn = Corn, Cot = Cotton, Fa = Fallow, NG = Native Grass, Past = Pasture, Pnut = Peanut, Sb = Soybean, SG = Small grains, Sorg = Sorghum, Wh = Wheat, Veg = Vegetable (Veg may include vegetables, fruit, nut, etc.)

TABLE 2
Mitigation Effectiveness Guide - Reducing Pesticide Impacts on Water Quality

Note: Pest Management (595) requires environmental risk evaluation and appropriate mitigation for all identified resource concerns. This table identifies **Management Techniques** and **Conservation Practices** that have the potential to mitigate pesticide impacts on water quality. Not all techniques will be applicable to a given situation. Relative effectiveness ratings by pesticide loss pathway are “no effect” (na), “slight effect” (+/-), “moderate effect” (++/--), and “significant effect” (+++/---). The table also identifies how the techniques function. Effectiveness of any mitigation technique can be highly variable based on site conditions and how it is designed. Therefore, with guidance provided by the table, site-specific selection and design of mitigation techniques that are appropriate for identified resource concerns is left to the professional judgment of the conservation planner.

Mitigation Techniques	**Pesticide Loss Pathways**			**Function**
Management Practices	**Leaching**	**Solution Runoff**	**Adsorbed Runoff**	
Pesticide Label Environmental Hazard Warnings and BMPs	Required	Required	Required	Reduces exposure potential - label guidance must be carefully followed for pesticide applications near water bodies and on soils that are intrinsically vulnerable to erosion, runoff, or leaching
Timing of Application	+++	+++	+++	Reduces exposure potential – delay application when significant rainfall events are forecast that can reduce pesticide transport to ground and surface water, applying when conditions are optimal can reduce the amount of pesticide applied, also delaying application when wind speed is not in accordance with label requirements can reduce pesticide drift to surface water
Formulations/Adjuvants	++	++	+	Reduces exposure potential – use formulations and/or adjuvants that increase efficacy and allow lower application rates
Lower Application Rates	+++	+++	+++	Reduces exposure potential - use lowest effective rate
Partial Treatment, Spot Treatment	+++	+++	+++	Reduces exposure potential - spot treatment, banding and directed spraying reduce amount of pesticide applied
Set-backs	+	++	+	Reduces exposure potential - reduced application area reduces amount of pesticide applied, can also reduce inadvertent pesticide application and drift to surface water
Soil Incorporation – mechanical or irrigation	---	+++	+++	Reduces exposure potential for surface losses, but increases exposure potential for leaching losses
Substitute Alternative Pesticides	+++	+++	+++	Reduces hazard potential - use alternative pesticides with low environmental risk, select pesticides or rates with less impact on natural enemies, alternate pesticides to avoid or delay resistance

TABLE 2 - (continued)

Mitigation Techniques	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Conservation Practices				
Alley Cropping (311)	+	+	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, can provide habitat for beneficial insects which can reduce the need for pesticides, also can reduce pesticide drift to surface water
Anionic Polyacrylamide (PAM) Erosion Control (450)	-	+	+++	Increases infiltration and deep percolation, reduces soil erosion
Bedding (310)	+	+	+	Increases surface infiltration and aerobic pesticide degradation in the rootzone
Conservation Cover (327)	+++	+++	+++	Retiring land from annual crop production often reduces the need for pesticides, builds soil organic matter
Constructed Wetland (656)	+	+	++	Captures pesticide residues and facilitates their degradation
Conservation Crop Rotation (328)	++	++	++	Reduces the need for pesticides by breaking pest lifecycles
Contour Buffer Strips (332)	na	++	++	Increases infiltration, reduces soil erosion
Contour Farming (330)	-	+	+	Increases infiltration and deep percolation, reduces soil erosion
Cover Crop (340)	+	+	++	Increases infiltration, reduces soil erosion, builds soil organic matter
Cross Wind Ridges (589A)	na	na	+	Reduces wind erosion and adsorbed pesticide deposition in surface water caused by wind
Cross Wind Trap Strips (589C)	na	na	++	Reduces wind erosion and adsorbed pesticide deposition in surface water caused by wind, traps adsorbed pesticides
Deep Tillage (324)	-	+	+	Increases infiltration and deep percolation
Field Border (386)	na	+	++	Increases infiltration and traps adsorbed pesticides, often reduces application area resulting in less pesticide applied, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, also can reduce inadvertent pesticide application and drift to surface water
Filter Strip (393)	na	++	+++	Increases infiltration and traps adsorbed pesticides, often reduces application area resulting in less pesticide applied, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, also can reduce inadvertent pesticide application and drift to surface water

TABLE 2 - (continued)

Mitigation Techniques	Pesticide Loss Pathways			Function
Conservation Practices	**Leaching**	**Solution Runoff**	**Adsorbed Runoff**	
Forage Harvest Management (511)	++	++	++	Reduces exposure potential - timely harvesting reduces the need for pesticides
Forest Stand Improvement (666)	++	++	++	Reduces the potential for pest damage and the need for pesticides
Grade Stabilization Structure (410)	na	na	++	Traps adsorbed pesticides
Grassed Waterway (412)	na	+	++	Increases infiltration and traps adsorbed pesticides (should be applied with Filter Strips at the outlet and on each side of the waterway)
Herbaceous Wind Barriers (603)	na	na	+	Reduces wind erosion, traps adsorbed pesticides, can provide habitat for beneficial insects which reduces the need for pesticides, can provide habitat to congregate pests which can result in reduced pesticide application, also can reduce pesticide drift to surface water
Irrigation Land Leveling (464)	++	+	++	Reduces exposure potential - uniform surface reduces pesticide transport to ground and surface water
Irrigation System, Microirrigation (441)	++	+++	+++	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Sprinkler (442)	++	++	++	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System, Surface and Subsurface (443)	+	+	+	Reduces exposure potential - efficient and uniform irrigation reduces pesticide transport to ground and surface water
Irrigation System Tail Water Recovery (447)	na	+++	+++	Captures pesticide residues and facilitates their degradation
Irrigation Water Management (449)	+++	+++	+++	Reduces exposure potential - water is applied at rates that minimize pesticide transport to ground and surface water, promotes healthy plants which can better tolerate pests
Mulching (484)	+	+/-	+/-	Often reduces the need for pesticides, natural mulches increase infiltration and reduce soil erosion (+ solution and adsorbed runoff), artificial mulches may increase runoff and erosion (- solution and adsorbed runoff)
Nutrient Management (590)	++	++	++	Promotes healthy plants which can better tolerate pests
Pasture and Hay Planting (512)	++	++	++	Retiring land from annual crop production often reduces the need for pesticides, builds soil organic matter

TABLE 2 - (continued)

Mitigation Techniques	Pesticide Loss Pathways			Function
	Leaching	Solution Runoff	Adsorbed Runoff	
Conservation Practices				
Precision Land Forming (462)	++	+	++	Reduces exposure potential - uniform surface reduces pesticide transport to ground and surface water
Prescribed Burning (338)	++	++	++	Often reduces the need for pesticides
Prescribed Grazing (528A)	++	++	++	Improves plant health and vigor and reduces the impact of pesticides
Range Planting (550)	++	++	++	Increases infiltration and uptake of subsurface water, reduces soil erosion, builds soil organic matter
Residue Management, (329A, B, C, and 344)	+	++	+++	Increases infiltration, reduces soil erosion, builds soil organic matter
Residue Management (344)	+	+	+	Increases infiltration, reduces soil erosion, builds soil organic matter
Riparian Forest Buffer (391)	+	+++	+++	Increases infiltration and uptake of subsurface water, traps sediment, builds soil organic matter
Riparian Herbaceous Cover (390)	+	++	++	Increases infiltration, traps sediment, builds soil organic matter
Sediment Basin (350)	na	na	++	Captures pesticide residues and facilitates their degradation
Stripcropping (585)	na	++	++	Increases infiltration, reduces soil erosion, traps wind blow soil
Structure For Water Control (587)	-	++	+++	Captures pesticide residues and facilitates their degradation, increases infiltration and deep percolation
Surface Drainage, Field Ditch (607)	+	+	+	Increases infiltration and aerobic pesticide degradation in the rootzone
Terrace (600)	--	++	+++	Increases infiltration and deep percolation, reduces soil erosion
Tree and Shrub Establishment (612)	+++	+++	+++	Retiring land from annual crop production often reduces the need for pesticides, increases infiltration and uptake of subsurface water, builds soil organic matter
Vegetative Barriers (601)	na	na	++	Reduces soil erosion, traps sediment, increases infiltration
Waste Storage Facility (313)	+	++	++	Captures pesticide residues in waste water facilities and facilitates their degradation
Waste Treatment Lagoon (359)	na	+++	+++	Captures pesticide residues and facilitates their degradation
Waste Utilization (633)	++	++	++	Increases soil organic matter
Water and Sediment Control Basin (638)	-	++	+++	Captures pesticide residues and facilitates their degradation, increases infiltration and deep percolation
Well Decommissioning (351)	+++	na	na	Eliminates point source contamination

TABLE 2 - (continued)

Mitigation Techniques	Pesticide Loss Pathways			Function
Conservation Practices	Leaching	Solution Runoff	Adsorbed Runoff	
Wetland Creation (658)	+	+	+	Captures pesticide residues and facilitates their degradation
Wetland Enhancement (659)	+	+	+	Captures pesticide residues and facilitates their degradation
Wetland Restoration (657)	+	+	+	Captures pesticide residues and facilitates their degradation
Windbreak/Shelterbelt Establishment (380)	na	na	++	Reduces wind erosion, reduces adsorbed pesticide deposition in surface water, traps adsorbed pesticides, also can reduce pesticide drift
Windbreak/Shelterbelt Renovation (650)	na	na	++	Reduces wind erosion, reduces adsorbed pesticide deposition in surface water, traps adsorbed pesticides, also can reduce pesticide drift