NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE SPECIFICATION GUIDELINE

PEST MANAGEMENT

(acre)

CODE 595

1. Scope

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.

2. Minimum Specifications

The following components shall be included in the pest management plan. Those items marked with an asterisk (*) will be recorded as minimum documentation requirements.

- ***Document resource concerns, problems, and practice objective.**
- ***Aerial photo, map, or sketch of the site**
- ***Extent in acres**
- ***Soil map of the site**

  Soil type with the most limiting features will be used in evaluation of environmental impact of the pesticide management. (Note to planner: Field can be subdivided into subfields, if necessary, to provide improved planning options.)

- ***Land use; crop sequence/rotation information**

  The crop sequence or rotation should describe the sequence of crops for at least five years. Start with last year's crop and project the crop rotation for the next four years. Circle the current crop. In non-cropland areas identify producer management decisions which mostly have contributed to pest development.

- ***Identify target pest(s)**

  Use field scouting and treatment thresholds to determine if pest controls should be used. The method used to determine treatment threshold will be documented in the conservation plan. Examples: no. of pests/ac; no. of pests/ft. of row length; no. of pests/plant; stem count decision method, etc.

- ***Identify the pest control method**

  Cultural methods: Cultural methods of pest control break the infestation cycle by making the environment less suitable for pest survival. This is accomplished by:

  - Reducing favorable habitat of pests
  - Altering planting patterns to disrupt in time and space the food and other habitat resources required by the pest
  - Diverting mobile pests away from the crop
  - Enhancing the vigor of the crop that it can better tolerate pest injury

Biological controls: Biological controls use living organisms (natural enemies) to suppress populations of other pests. These include:

- Predators - free living animals (insects, arthropods, birds, reptiles and mammals) that eat pests.
- Parasitoids - insect parasites of other insects. Most parasitoids are small wasps or flies.
- Pathogens - disease causing microorganisms, including viruses, bacteria, fungi, and nematodes.

Mechanical control: These include temperature manipulations, screens placed in irrigation ditches to reduce weed seed movement, insect traps, and frightening devices to repel birds and mammal pests. Mechanical control also includes tillage, rouging, and manual pulling of weeds.

Host resistance: Planting varieties tolerant of or resistant to pest attack is an economical and safe method of pest control.

Chemical control: Once the decision has been made to use a chemical pest control method, select a product based on its suitability to control the identified target pest.

- ***Product, rate, application method, timing and form**

  Select a pesticide for your crop and pest problem that is listed in the current pesticide guides provided by Kansas State University Cooperative Extension Service (ex. 2004 Chemical Weed Control for Field Crops, Pastures, Rangeland and Non-cropland). The use of a professional crop consultant trained in Integrated Pest Management (IPM) methods, is encouraged, especially in identified sensitive water quality areas. Do not apply pesticides that carry ground-water warnings on the label to soils that are vulnerable to ground-water contamination (Intermediate or High leaching potential). Post-emergence applications of pesticides should be discouraged immediately prior to anticipated rainfall to prevent surface water contamination and poor control of target pests. Avoid repetitive use of the same pesticide or pesticides of similar chemistry to reduce the potential for pesticide resistance development. Time pesticide applications in relation to present soil moisture and anticipated rainfall conditions. Irrigation should be managed to achieve the greatest efficiency and reduce potential for off-site transport. Determine the method of application, such as ground or aerial spraying, wicking, granules, etc. This is important since application method impacts the degree of drift, volatilization, environmental hazard to surface and ground-water, and effectiveness to control target pest.

3. Guidelines applicable for all purposes

Pest management activities shall comply with all applicable federal, state, local laws, regulations, management plans for invasive pest species, noxious weeds, and disease vectors. Pest management plans shall be compatible with other components of a conservation plan and include appropriate mitigation techniques to reduce environmental risk. Persons who review or approve plans for pest management shall be certified through any certification program acceptable to the NRCS. Planners will identify fields or areas of fields that are susceptible to surface or ground-water contamination. An evaluation will be made for each field with an identified surface or ground-water resource. Important groundwater resources are identified by reviewing the state map, Ground Water Sensitive Areas (http://www.kcc.state.ks.us/maps/groundwater.htm), and/or local United States Geological Survey (USGS) water resource reports, or additional compiled aquifer information located in Section I of the electronic Field Office Technical Guide (eFOTG). For surface water protection fields bordering a semi-permanent wetland, lake, river, stream, or that contain a conveyance to these waters, should be considered to have a potential to contribute contaminates to surface waters. A conveyance may be defined as a drainage ditch, tile inlet, intermittent stream, waterway, or un-vegetated channel. When an important ground-water resource is identified or a field has a potential to contribute to surface water contamination, the field will be evaluated with Windows Pesticide Screening Tool (WIN_PST) or other tools that utilize the databases and matrixes of this model.

- **Additional guidelines to protect quantity and quality of commodities**

  All appropriate federal, state, and local standards to protect against contamination with transgenic crops, noxious weeds, etc., will be followed. Organic crops will abide by applicable federal, state, or local standards.

- **Additional guidelines to protect soil resources**
  Current erosion prediction technology in Section I of eFOTG and Quality Criteria in Section III, shall be used to evaluate erosion potential for wind, water, and concentrated flow erosion. Pesticides will be applied according to label instructions, including precautionary statements to limit soil pesticide residues, and negative effects on future crops or non-target plants/crops, animals, and humans.

- **Additional guidelines to protect water resources**
  Pesticide applications shall be made according to label instructions, including precautionary statements regarding water resources to limit leaching and runoff losses of pesticide residues.
  The potential loss of pesticides to surface, ground-water, and the negative impacts to humans, plants, and animals will be evaluated using the NRCS Win-PST.
  If Win-PST evaluation indicates that a pesticide application has an **extra high, high,** or **intermediate** hazard potential (leaching solution runoff or adsorbed runoff); appropriate mitigation measures and conservation practices will be implemented (refer to guidance on mitigation for pesticide losses). If Win-PST evaluation indicates that a pesticide application has a **low** or **very low** hazard potential, no additional mitigation measures are required. Mitigation measures must not already be accounted for in the risk assessment (i.e., WIN-PST evaluation).

- **Mitigation for pesticide losses**
  An appropriate set of mitigation techniques must be planned and implemented to reduce the environmental risks to surface and ground-water due to pest management activities in accordance with water quality criteria in Section III of the eFOTG. Mitigation techniques listed in Appendix A include Conservation Practices such as Conservation Crop Rotations; Filter Strips; and pesticide management techniques listed in Appendix A.
  Mitigation measures must be appropriate for the pesticide loss pathway on the site. These include leaching, and surface loss due to erosion and/or runoff. Pesticide loss occurs by detachment and transport of pesticides adsorbed to sediment or in solution. Transport due to water erosion and runoff can occur in sheet flow or concentrated flow.
  Refer to Table 1 for the minimum number of mitigation measures and Appendix A for a list of mitigation measures. Mitigation measures include both pesticide management measures and conservation practices that are appropriate to mitigate potential pesticide loss for the pathway(s) of concern.

[1/]Table 1 Additional Mitigation Measures (measures not accounted for in WIN-pst)

Hazard Potential (Leaching, Solution Runoff, and Adsorbed Runoff	Mitigation Measures including [2/]Pesticide Management Techniques and [3/]Conservation Practices (+ or ++ measures)
Intermediate	1 or more
High	2 or more
Very High	3 or more

[1/]Conservation practices and pesticide management techniques must be appropriate for each pesticide loss pathway(s) applicable on the site. Mitigation measures that eliminate use of pesticides or are rated with three pluses (+++) are adequate as stand-alone measures for the pathway(s) of concern.

[2/]Pesticide management measures must be included in the integrated pest management plan/job sheets used to document practice implementation.

[3/]Conservation practices must be included in the conservation plan for the field(s)/site(s).

- **Additional guidelines to protect air resources**
  Pesticide applications shall be made according to label instructions including precautionary statements and university recommendations regarding air resources to minimize volatilization, drift, and transport through wind erosion that may negatively impact non-target plants, animals, and humans. Method of application and pesticide formulation shall be appropriate for the conditions and consistent with pesticide label requirements. Wind speed, temperature, humidity, and other climatic factors will be monitored as applicable on pesticide label instructions. Refer to Appendix A for mitigation measures that are effective at minimizing wind erosion.

- **Additional guidelines to protect plant and animal resources**
  Clients shall adhere to pesticide label instructions including precautionary statements and university recommendations to avoid negative impacts on non-target plants including those directed at:
  - Pesticide applications that may impact endangered plant species will be avoided. When endangered species are or may be impacted, pesticide applicators shall consult their county's Endangered Species Program for recommendations concerning pesticides and endangered species (refer to eFOTG, Section II).

- **Additional guidelines to protect humans**
  Pesticide applications shall be made according to local, state, and federal regulations, label instructions, including precautionary statements and university recommendations to minimize negative impacts to humans including those directed at:
  - Re-entry intervals (REIs) for fields treated with pesticides
  - Proper storage, handling, and disposal of pesticide containers
  - Proper protection to avoid back-siphoning into water wells from sprayer tanks
  - Proper protection to avoid back-siphoning of chemigation equipment into the irrigation water source
  - Use of proper protective clothing and equipment during mixing/handling and application

- **Instructions for complying with the worker protection standard**
  Pesticide users are encouraged to take private or commercial pesticide applicators training offered by the Department of Agriculture. Persons purchasing or applying "restricted use" pesticides are required to take this training and be certified with the Department of Agriculture.

4. Considerations

The following Integrated Pest Management (IPM) principles should be considered when appropriate:

- Agronomic/management measures that will reduce plant stress and improve plant vigor will increase the plant's overall ability to tolerate pests. These measures include adequate plant nutrients and soil amendments, residue management that optimizes soil moisture, proper soil conditions (compaction and tilth), proper irrigation management on irrigated land, and other measures that optimize plant vigor.
- When necessary to use chemical controls, consider efficacy and 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. Also, consider slope, climate, and sensitive areas to determine the potential impact on water quality.
- Consider present soil moisture, anticipated weather conditions, and irrigation plans to achieve the greatest efficacy and reduce potential for off-site transport.
- Consider using banded or spot treatment of pests where appropriate to reduce costs and environmental risk.

- Consider using hand weeding/rouging where appropriate.
- All pesticide users are encouraged to obtain training to become certified in pesticide application even if they do not apply restricted-use pesticides.
- Consider recycling containers at pesticide waste collection sites.
- Consider method of pesticide application such as ground or aerial spraying, chemigation, wicking, application of granules, etc., since the degree of drift and volatilization will vary considerably by method.

5. Operation and maintenance

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

- Review and update the plan periodically in order 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 and addresses of emergency treatment centers for individuals exposed to chemicals and the telephone number for the nearest poison control center.

The National Pesticide Information Center (NPIC) telephone number in Corvallis, Oregon, may also be given to provide information to:

- Help callers interpret and understand toxicology and environmental chemistry information about pesticides
- Access pesticide label information
- Direct callers for pesticide incident investigation, emergency human and animal treatment, safety practices, clean-up and disposal, and laboratory analysis
- Supply general information on regulation of pesticides in the United States

1-800-858-7384
Monday - Friday
6:30 a.m. to 4:30 p.m. Pacific Time

For advice and assistance with emergency spills and other emergencies that involve pesticides, use the following phone numbers:

Involving human health/injury:
911
Involving roads or right of ways:
Kansas Highway Patrol
1-785-296-6800
All other spills: Kansas Department of Health and Environment
785-296-1679 during work-week hours,
or **785-296-0614** during weekends or after hours
Kansas Poison Control Center:
1-800-222-1222
Emergency TDD **1-913-588-6639**
The national 24-hour CHEMTREC telephone number is:
1-800-424-9300

Prevent back-siphoning of pesticide mixture into water supply. When adding water to spray tanks, keep air space between water supply hose and spray tank.

When chemigating, user must obtain necessary permits. 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.

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

Read and follow label directions and maintain appropriate Material Safety Data Sheets (MSDS). http://www.greenbook.net/greenbook.html or http://www.cdms.net/pfa/LUpdateMsg.asp

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.

Dispose of leftover pesticides and containers according to label requirements and never re-use them for other purposes. Return unopened pesticides to the supplier.

The pesticide user must be fully trained and must obtain pesticide applicator certification to apply restricted use pesticides. Information on obtaining this permit may be obtained from the Department of Agriculture or local Cooperative Extension Service.

Refer to plans and specifications section of this standard and practice documentation guide for detailed guidance on record-keeping requirements.

REFERENCES

C & P Press Product Labels and MSDS sheets
http://www.greenbook.net/greenbook.html
Crop Data Management Systems
http://www.cdms.net/pfa/LUpdateMsg.asp
EPA's Endanger Species Program and county bulletins
http://www.epa.gov/espp/kansas/kansas.htm
Kansas State University Extension and Research Circulars, including those on pest management, pesticides management, and protecting natural resources
http://www.oznet.ksu.edu/library/crpsl2/
The Worker Protection Standard
http://www.oznet.ksu.edu/pesticides-ipm/pesticides.htm
Kansas Department of Agriculture's Pesticide and Fertilizer Program
http://www.accesskansas.org/kda/Pest&Fert/Pest-mainpage.htm
Kansas Farm/Home*A*Syst
http://www.sbeap.org/homeasyst/Water_qual_prot_assess_form.PDF

APPENDIX A MITIGATION EFFECTIVENESS GUIDE

The following guide identifies mitigation measures and conservation practices and rates their relative effectiveness to mitigate pesticide loss by pesticide loss pathway. Site-specific selection of appropriate pesticide management techniques and conservation practices needed to address identified resource concerns shall be left to the professional judgment of the planner and conservation objectives of the producer. Effects will vary due to practice design and site conditions and may need to be adjusted appropriately. Refer to Section V of the Field Office Technical Guide to determine water quality impacts (Conservation Practice Effects) for conservation practices that are not listed in Appendix A. Relative effects on reducing pesticide loss are listed for a given pesticide loss pathway:

Relative Effect on Pesticide Loss

- (+++) = Significant Positive Effect on Pesticide Loss
- (++) = Moderate Positive Effect on Pesticide Loss
- (+) = Slight Positive Effect on Pesticide Loss
- (-) = Slight Negative Effect on Pesticide Loss
- N/A = Generally No Appreciable Effect on Pesticide Loss
- Multiple listing = Different impacts on pesticide loss depending on practice design and site conditions

Pesticide Loss Pathways:

- Wind Erosion = Pesticides are adsorbed to sediment transported by wind erosion processes (saltation, creep and suspension)
- Leaching = Pesticides move in solution through soil profile.
- Solution Runoff = Pesticides transported in runoff water in solution.
- Adsorbed to Sediment = Pesticides adsorbed to sediment in runoff water.
- Concentrated Solution Runoff = Pesticide transported in runoff water in solution in concentrated channels/ditches etc.
- Concentrated Runoff Adsorbed = Pesticides adsorbed to sediment in runoff water transported in concentrated channels/ditches etc.

[1/ & 2/] **Pesticide Management Measures/Relative Effectiveness to Mitigate Pesticide Loss by Pesticide Loss Pathway**

Pesticide Management Techniques	Wind Erosion	Leaching	Solution Runoff	Adsorbed to Sediment	Concentrated Solution Runoff	Concentrated Runoff adsorbed	Description/requirements
Application Timing	N/A	++	++	++	N/A	N/A	Apply pesticides according to label instructions and when conditions are optimal (soil conditions, rainfall events forecast, wind speed, etc.) to minimize pesticide losses decreasing environmental risk.
Band or Spot Application	N/A	++	++	++	N/A	N/A	Spot application, banding, or directed spray according to pesticide label to decrease pesticide exposure and environmental risk.
Lower Application Rates including the use of Formulations and/or Adjuvant	N/A	++	++	++	N/A	N/A	Use applicable formulations and/or adjuvant to increase efficacy and decrease application rates according to pesticide labels or use the lowest effective application rate on pesticide labels to decrease environmental risk.
Mechanical or Biological Pest Control (entirely replaces pesticides)	N/A	+++	+++	+++	N/A	N/A	Substitute mechanical or biological weed control such as cultivation or shredding or biological controls in lieu of pesticides (no pesticide use)
Mechanical or Biological Pest Control (reduce application rate of pesticides)	N/A	++	++	++	N/A	N/A	Substitute mechanical weed control such as cultivation or shredding and reduce pesticide rates or need of subsequent applications (reduced use of pesticides).
Pesticide Label Precautionary Statements	N/A	++	++	++	N/A	N/A	Abide by precautionary statements on recommendations to minimize environmental hazards that are included on pesticide labels that will decrease loss potential in the applicable pesticide loss pathway. All pesticide label requirements must be carefully followed.

Partial Substitution	N/A	++	++	++	N/A	N/A	Use alternate pesticides in a tank-mix or split applications to reduce application rate and decrease environmental risk. Substituted pesticides must have a lower risk for loss in the designated pesticide loss pathway.
Set-backs	N/A	+	+	+	N/A	N/A	Setbacks between application areas and sensitive areas can decrease pesticide exposure and environmental risk, (includes no application in sensitive area).
Soil Incorporation	N/A	-/N/A	++	-	N/A	N/A	Soil incorporation can decrease the potential for surface losses (no applications in sensitive area itself).

[1/] All Pesticide applications are based on economic thresholds and field scouting prior to application. Selected pesticide management techniques shall be included in IPM plan for the site.
[2/] Refer to Kansas Department of Agriculture and Kansas State University Cooperative Extension publications and the pesticide label for additional information about pest management mitigation.

[1/ & 2/] **Non-Cropland, or Cropland Conversion Practices**

Conservation Practice	Wind Erosion	Leaching	Solution Runoff	Adsorbed to Sediment	Concentrated Solution Runoff	Concentrated Runoff adsorbed	Description/requirements
Brush Management (314)	N/A	+++	+++	+++	N/A	N/A	Use of mechanical brush control and/or prescribed burning in lieu of chemical controls.
Grade Stabilization Structure (410)	N/A	N/A	N/A	+	+	++	Grade stabilization can decrease head-cutting and sediment transport in natural and artificial channels and capture sediment from runoff and provide residence time for sediment to settle out of runoff water.
Pasture and Hay Planting (512)	++	++	++	++	N/A	N/A	Shifting land use to pasture and hayland can increase infiltration, leaching, and organic matter, and decrease runoff and pesticide requirements.
Prescribed Burning (338)	-	+	+	+	N/A	N/A	Burning can increase sediment transport and reduce pesticide requirements.
Prescribed Grazing (528)	+	-	+	+	N/A	N/A	Proper grazing can increase infiltration, leaching, and cover while decreasing sediment transport and pesticide requirements.
Range Planting (550)	++	++	++	++	N/A	N/A	Shifting land use to pasture and hayland can increase infiltration, leaching, and organic matter and decrease runoff and pesticide requirements.

Tree and Shrub Establishment (612)	+	++	++	++	N/A	N/A	Establishment of woody vegetation can increase infiltration and leaching and decrease erosion, sediment transport and pesticide requirements.
Wetland Creation (658) Development or Restoration (657) or Constructed Wetland (656)	N/A	-	+	+	++	++	Wetlands can increase infiltration and leaching while decreasing sediment transport to surface water by capturing sediment from runoff and provide residence time for pesticides breakdown.

[1/]Selected conservation practices will be incorporated in the conservation plan.
[2/]Refer to the NRCS eFOTG, Section V, for additional information about Conservation Practice Physical Effects.

[1/ & 2/] **Cropland Practices**

Practice	Wind Erosion	Leaching	Solution Runoff	Adsorbed to Sediment	Concentrate Solution Runoff	Concentrate Runoff Adsorbed	Description/requirements
Anionic Polyacrylamide (PAM) Erosion Control (450)							
Conservation Crop Rotation (328)	+/-	+	+	+	N/A	N/A	Conservation crop rotations where two or more crops (crops must be significantly different such as corn-soybean rotation) can be used to break pest lifecycles to decrease pesticide requirements.
Conservation Crop Rotation with 50% legumes and/or small grain with row crops (328)	+	++	++	++	N/A	N/A	Conservation crop rotations where 50% are in small grains, legumes, or grasses (crops must be significantly different), can be used to decrease erosion and break pest lifecycles to decrease pesticide requirements.

Contour Buffer Strips (332)	+	+/-	+	++	N/A	+	Contour farming can increase infiltration and leaching and decrease runoff and sediment transport to surface water. Less pesticides and nutrients are applied in grassed areas resulting in less leaching potential on some sites.
Contour Farming (330)	N/A	-	+	++	N/A	N/A	Contour farming can increase infiltration and leaching and decrease runoff and sediment transport to surface water.
Cover Crop (340)	++	+	+	++	N/A	N/A	Cover crops can increase organic matter and decrease erosion and movement of residual pesticides to surface and groundwater.
Cross Wind Ridges (589A)	++	N/A	+	+	N/A	N/A	Ridges installed perpendicular to the prevailing wind erosion and water flow direction can decrease transport of adsorbed pesticides.
Cross Wind Trap Strips (589C)	++	+	+	+	N/A	N/A	Strip of grass or suitable crops/crop stubble installed perpendicular to the prevailing wind erosion direction can decrease transport of adsorbed pesticides.
Deep Tillage (324)	+	N/A	+	+	N/A	N/A	Deep tillage can increase infiltration and leaching while decreasing runoff and wind erosion.
Field Border (386)	+	N/A	+	+	N/A	N/A	Field borders can decrease sediment transport and the extent of application areas, increase setback distances, and provide beneficial insect habitat and habitat to cause pest insects to congregate.
Filter Strip (393)	+	+/-	+	++	N/A	N/A	Filter strips can decrease sediment transport and the extent of application areas, increase infiltration and leaching and setback distances and provide beneficial insect habitat and habitat to cause pest insects to congregate.
Grassed Waterway (412)	+	+	+	++	+	++	Grassed waterways can increase infiltration and leaching and decrease sediment transport. (Apply with filter strips at the outlet and on each side of the waterway).
Herbaceous Wind Barriers (603)	++	N/A	+	+	N/A	N/A	Narrow strip of grass installed perpendicular to the prevailing wind erosion and water flow direction can decrease transport of adsorbed pesticides.
Irrigation Land Leveling (464)	N/A	+	+	+	N/A	N/A	Land leveling can increase irrigation application uniformity and decrease pesticide transport to surface and groundwater.
Irrigation System Sprinkler (442)	N/A	++	+	+	N/A	N/A	Converting existing irrigated fields from gravity/surface irrigation systems to sprinkler. Irrigation Water Management (449) must be applied.

Irrigation System Tail Water Recovery (447)	N/A	++	++	++	+	++	Tail water recovery systems can increase leaching and decrease sediment transport (irrigation water management must be applied).
Irrigation Water Management (449)	N/A	++	++	++	N/A	N/A	Controlled application of irrigation water can minimize pesticide transport to surface and groundwater.
Residue and Tillage Management, No-Till/Strip Till/Direct Seed (329)	++	-	+	++	N/A	N/A	Leaving crop residues on the soil surface can increase infiltration and leaching and decrease erosion and sediment transport.
Residue and Tillage Management, Mulch-Till (345)	+	-	+	+	N/A	N/A	Leaving crop residues on the soil surface can increase infiltration and leaching and decrease erosion and sediment transport.
Residue and Tillage Management, Ridge Till (346)	++	-	+	++	N/A	N/A	Leaving crop residues on the soil surface can increase infiltration and leaching and decrease erosion and sediment transport.
Residue Management, Seasonal (344)	+	-	+	+	N/A	N/A	Leaving crop residues on the soil surface can increase infiltration and leaching and decrease erosion and sediment transport.
Riparian Forest Buffer (391) and Riparian Herbaceous Cover (390)	+	+	++	++	N/A	N/A	Riparian buffers can utilize and trap nutrients and chemicals in shallow groundwater and decrease sediment transport in surface flow.
Row Arrangement (557)	+	+/-	+	+	N/A	N/A	Establishment of crop rows on planned grades and lengths can decrease erosion and sediment transport. Leaching can be increased if row grade is flatter and decrease if drainage patterns are improved.

Sediment Basin (350)	N/A	-	++	+++	+	+++	Sediment basins capture sediment from water erosion and provide residence time for sediment to settle out of runoff water.
Stripcropping (585)	++	-	+	++	N/A	+	Contour stripcropping for runoff and water erosion, wind stripcropping for wind erosion control. Stripcropping can also reduce small concentrated flow areas when placed across flow areas.
Subsurface Drainage (606)	N/A	++	-	++	N/A	N/A	Collection and conveyance of drainage water can decrease leaching and sediment yield and increase aerobic pesticide degradation in the root zone. Avoid direct outlets to surface water.
Surface Roughening (609)	+	-	+	+	N/A	N/A	Random roughness can decrease water and wind erosion and transport of adsorbed pesticides while increasing infiltration and leaching.
Terrace (600) Gradient	N/A (unless grassed)	-	-	++	+	++	Earthen embankments and/or channels constructed across the slope can increase infiltration and leaching while decreasing erosion and sediment transport.
Terrace (600) Flat Channel and Closed Outlet	N/A (unless grassed)	-	+	+++	+	+++	Earthen embankments and/or channels constructed across the slope can increase infiltration and leaching while decreasing erosion and sediment transport.
Windbreak/Shelterbelt Establishment (380)	++	+	+	+	N/A	N/A	Field Windbreaks installed perpendicular to prevailing wind direction within cropland fields
Water and Sediment Control Basin (638)	N/A	-	++	++	+	+++	Water and Sediment Control Basins capture sediment from water erosion and provide residence time for sediment to settle out of runoff water.

[1/] Selected conservation practices will be incorporated in the conservation plan.
[2/] Refer to the Kansas NRCS Field Office Technical Guide, Section V, for additional information about Conservation Practice Physical Effects.

Point Source Conservation Practices (Not applicable to non-point losses in agricultural fields)

Practice	Wind Erosion	Leaching	Solution Runoff	Adsorbed to Sedime	Concentrate Solution Runoff	Concentrate Runoff Adsorbed	Description/requirements
Agrichemical Handling Facility (interim)	N/A	N/A	N/A	N/A	N/A	N/A	Use agrichemical-handling facilities for mixing and loading to decrease point source pollution potential.
Well Decommissio ning (351)	N/A	N/A	N/A	N/A	N/A	N/A	Sealing and permanent closure of abandoned water wells can decrease point source pollution potential.

REFERENCES:

Aquatic Dialogue Group: Pesticide Risk Assessment and Mitigation Various Authors, 1994 Society of Environmental Toxicology and Chemistry, Pensacola, FL., pages 99-111 and Table 4-2.
USDA Natural Resources Conservation Service National Employee Development Center Nutrient and Pest Management Considerations in Conservation Planning Course materials
Field Office Technical Guide, Section V CPPE Matrix
USDA Natural Resources conservation Service Water Quality Indicators Guide Surface Waters SCS-TP-161, September 1989