TECHNICAL NOTES

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

IOWA STATE OFFICE
DES MOINES, IOWA

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Subject: WINDOWS PESTICIDE SCREENING TOOL 3.0

This technical note is to be used to assess the risk of pesticides moving off site and delivery to surface and/or ground waters. The Windows Pesticide Screening Tool 3.0 (WIN-PST 3.0) is a tool to help conservation planners, landowners/landusers, and others evaluate the current risk of pesticides reaching surface and/or ground waters from a specific site.

The information contained within the WIN-PST 3.0 model is site specific and requires specific field management information to complete the rating. Under certain conditions, the result of the WIN-PST 3.0 model is a required component of the Natural Resources Conservation Service Pest Management Standard 595.

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WINDOWS PESTICIDE SCREENING TOOL 3.0

Purpose and Background:

This technical note will provide the background and basic instructions to use the Windows Pesticide Screening Tool 3.0 (WIN-PST 3.0). WIN-PST 3.0 is a pesticide environmental risk screening tool that NRCS field office conservationists, extension agents, crop consultants, pesticide dealers, and producers can use to evaluate the potential for pesticides to move with water and eroded soil/organic matter and affect non-target organisms. NRCS staff and partners (such as private crop consultants) now have access to an easy-to-use tool for considering environmental risk when making recommendations that were previously based only on efficacy and economics. WIN-PST 3.0 goes beyond previous NRCS screening tools to consider the impact of water table depth, irrigation, residue management, pesticide application area, method and rate class (Standard, Low, and Ultralow), and toxicity.

WIN-PST 3.0 users can specify pesticides by product name or active ingredient. Long-term human and fish toxicity data and ratings are also included in WIN-PST 3.0. These toxicity ratings can be combined with the off-site movement potential ratings to provide an overall rating of the potential risks from pesticide movement below the root zone and past the edge of the field.

WIN-PST 3.0 evaluates the potential loss by leaching and surface runoff. It utilizes both soil and pesticide properties. WIN-PST 3.0 does not provide absolute results or consider the type of crop or range plant.

The USDA-NRCS National Weather and Climate Center developed and supports WIN-PST 3.0. The current NRCS Pest Management Policy and Pest Management Standard (595) requires the use of WIN-PST 3.0 or other NRCS-approved environmental risk analysis tools to support the pest management component of a conservation plan.

Computer Logistics:

To operate the tool, the user will need a computer with at least a Pentium or equivalent processor running at 100 Mhz; Windows 95, 98; or NT 4.0 (including CCE Configurations) operating systems, 16 meg of RAM or better; and 65 meg disk space or better before installation.

To download the WIN-PST 3.0 program, log in as administrator and go to http://www.wcc.nrcs.usda.gov/pestmgt. Click on Download latest CCE Certification Software and Data; click on NRCS Download site (FTP). Print or read instructions on how to download WIN-PST 3.0 and installing Iowa soils.

To download Iowa Soils Data, go to http://www.ia.nrsc.usda.gov/tech_resources.htm. Click on Pest Management and Iowa Win-PST 3.0 Soils data information. Click on the County Soils folder. This folder contains all the county soils files by FIPS code. Copy the

soils file for your county to your C drive. Note the location where you copied the folder so you can navigate to the file through the WIN-PST 3.0 program. To determine the FIPS code for your county, open up the Excel file titled County FIPS code. See WIN-PST 3.0 Getting Started Guide to load the county soils data into the WIN-PST 3.0 program.

Click on the following link for the Getting Started Guide

ftp://ftp.wcc.nrcs.usda.gov/downloads/pestmgt/Getting_Started.pdf

Notes on Interpretation of WIN-PST 3.0 Soil-Pesticide Interaction Report

For the most part, doing a pesticide risk analysis is not much different from typical resource planning. That is, the same steps are valid, including conducting a resource inventory. However, some extra information must be collected, including probable pesticide uses and application details required by the pesticide environmental risk analysis tool that will be used. When this information can come from the producer or their crop consultant, it should include all likely pesticide uses for a particular land unit. Final decisions about specific pesticide uses are often based on field conditions that vary from year to year, but the pest management component of the conservation plan should account for this expected variability whenever possible to avoid the need for continuous updates. Occasionally, unexpected conditions may call for previously unplanned pesticide uses. As soon as practical, new pesticide uses should be included in an updated pest management component on the conservation plan.

Resource inventories should also identify existing mitigation techniques (management techniques and/or conservation practices) that will help reduce pesticide losses. Typical resource inventory data such as distance to surface and/or ground water, soil types (by component or map unit), and field slopes will also be utilized in the pesticide environmental risk analysis process.

Benchmark conditions (what the producer is currently doing) should be evaluated first to determine if there are potential hazards from either runoff or leaching. Alternatives and/or mitigation practices can then be developed for those benchmark practices that pose significant risk (WIN-PST 3.0 hazard rating of “INTERMEDIATE” or greater) to identified resource concerns.

NRCS is not in the business of making pesticide recommendations, but of analyzing “recommended pesticides”, within the framework of an IPM program, for their potential environmental impacts. Additionally, NRCS can provide environmental risk analysis on alternatives to pesticides such as tillage for weed control. Hazard mitigation practices (e.g., buffer strips, riparian areas, and crop rotation), whether dealing with pesticides, tillage, burning, etc., can be recommended by NRCS to reduce the potential environmental hazards of benchmark or planned alternatives.

WIN-PST 3.0 pesticide/soil combinations that have a “LOW” or “VERY LOW” hazard rating, would meet RMS criteria and not need mitigation. In some cases, where alternative IPM methodologies are available, the use of a pesticide with even a “LOW” or “VERY LOW” hazard rating may be inappropriate. Those soil/pesticide combinations that rate ”HIGH”or “INTERMEDIATE” are prime candidates for mitigation practices. Once pesticide risk screening is done, the next step is to provide mitigation strategies.

Those combinations rating “EXTRA HIGH” are considered potentially very hazardous. Using pesticides that have an “EXTRA HIGH” rating, indicates the potential to do great harm to the identified resource concern, mostly due to their extreme toxicity to non-target organisms. Mitigation practices for these pesticides may not be sufficient to prevent potentially severe damage to the resource. The potential for mitigation failure is high. These pesticides should only be used with extreme caution and as infrequently as possible. Although these chemicals are applied according to the label, reliance on chemicals that receive an “EXTRA HIGH” rating may prevent a plan from reaching RMS status, even with mitigation.

Interpreting the WIN-PST 3.0 hazard ratings

WIN-PST 3.0 classifies the potential hazards into 5 classes. The classes are:

X EXTRA HIGH
H HIGH
I INTERMEDIATE
L LOW
V VERY LOW

Only leaching hazard uses the very low class.

Action (mitigation) should be taken when a hazard for the resource concern is listed “EXTRA HIGH”, “HIGH”, or “INTERMEDIATE”. The use of mitigation measures on conservation treatment techniques included in the 595 worksheet/jobsheet can be used as guidance for developing a strategy. Hazard ratings of “HIGH” and “INTERMEDIATE” for sediment or runoff can usually be made acceptable by implementing appropriate mitigation measures. Hazard ratings of “HIGH” for leaching is more difficult to mitigate without using a less hazardous pesticide.

In general, “HIGH” hazard ratings warrant more extensive mitigation than “INTERMEDIATE” hazard ratings. How extensive mitigation needs to be is also dependent on other factors such as the existing level of impairment of the resource, resource sensitivity, and desired level of resource protection. For soil/pesticide combinations that are rated as an “EXTRA HIGH” hazard potential, mitigation may not be effective. For resources that are highly sensitive or for which a high degree of resource protection is desired, substitution of another less hazardous chemical may be the only remedy. In

these cases, the conservationist needs to work with the producer, crop consultant, or extension specialist to find efficacious, economically acceptable, and lower risk alternatives.

For soil/pesticide interactions classified as “LOW” or “VERY LOW” hazards, no further action or mitigation is needed. As long as these chemicals are used according to the label, they meet the pesticide quality criteria for RMS planning.

Ground and surface water vulnerability is not measured directly by WIN-PST 3.0. Instead, WIN-PST 3.0 gives risk estimates at the edge of the field or bottom of the root zone. Estimates of ground or surface water vulnerability would require information not easily obtained, such as ground water depth, vadose zone characteristics, travel time between edge of field and surface water, etc.

Significant attenuation of chemical contaminants may occur between the edge of the field or bottom of the root zone and surface or ground water. In fact, many mitigation strategies NRCS utilizes to reduce surface water contamination attempt to maximize attenuation of sediments and chemicals through lengthening the distance between the contamination source and the surface water resource. Other mitigation strategies attempt to either decrease the speed of runoff water (decreasing erosivity and sediment carrying capacity) or impound the runoff water (increasing infiltration and decreasing sediment carrying capacity). If, through mitigation practices, we can reduce hazardous pesticide losses from the edge of the field or bottom of the root zone, or prevent pesticides from entering surface or ground water, we can protect identified resources of concern.

The WIN-PST 3.0 hazard classes were developed to determine the potential hazard of an offsite pesticide movement. These ratings are created by combining the WIN-PST 3.0 interaction ratings with exposure adjusted toxicity ratings. The result is, for any WIN-PST 3.0 interaction rating and exposure-adjusted toxicity rating, a single hazard (potential hazard) rating for each resource concern (human and fish).

The exposure adjusted toxicity rating is a rating scheme devised by the WIN-PST 3.0 team to estimate the probability for a pesticide to exceed a concentration in the environment. It is broken down into 5 classes based on the long-term toxicity. This value is not based on the pesticide physical properties used in WIN-PST 3.0 loss potentials, but instead is based on best guess likelihood of a given pesticide applied at typical application rates (~0.5 kg/ha - 5.0 kg/ha) to exceed its long-term toxicity standard (e.g., EPA’s Health Advisory, MCL, or MATC). For example, if it’s extremely probable that a pesticide will exceed its toxicity threshold in the environment, it will be rated “EXTRA HIGH”. This toxicity adjustment helps to determine the relative hazard of a chemical that moves offsite.

Note: All methods of pest management must be integrated with other components of the conservation plan. Clients must be instructed to pay special attention to all environmental hazards and site-specific application criteria listed on pesticide labels and contained in extension and crop consultant recommendations. Mitigation practices shall be chosen which will not have a negative impact on any resource, including soil, water, air, plant, animal, or human.