Idaho State Department of Agriculture

Ground Water Quality Best Management Practices for Pesticide Application

December 2006

The Idaho State Department of Agriculture (ISDA) has developed a set of core voluntary Best Management Practices (BMPs) for pesticide application in order to help protect Idaho's ground water resources. The core voluntary BMPs are listed in the attached table entitled "Water Quality BMPs for Pesticide Application" and should be adopted when applying any agricultural pesticides in Idaho. The BMPs may also refer to mandatory label use requirements. Always read product labels before using pesticides.

State and federal law can require that the use of a pesticide be limited or curtailed due to the potential for adverse impacts on humans, wildlife or the environment. The Idaho Rules Governing Pesticide Management Plans for Ground Water Protection (IDAPA 02.03.01) outlines a process for responding to pesticide detections in ground water, including voluntary BMPs.

Careful planning in the use of pesticides can help protect water resources from future contamination and help reduce the levels of pesticides currently in Idaho's ground water. Planning also promotes the efficient and economical use of pesticides and may result in reduced application rates that may save money. Adopting the core voluntary BMPs will help growers maintain access to a variety of pesticides as important and diverse tools in the effort to control pests and protect water resources.

Best Management Practices (BMPs) for Pesticide Use

- BMPs are a practice or combination of practices determined to be the most effective and practical means of preventing or reducing pesticide contamination from nonpoint and point sources to achieve water quality goals and protect the beneficial uses of water.
- BMPs are used for control of sources of pollution from agriculture while considering if the practice is 1) technically feasible; 2) economically feasible; and 3) acceptable.
- From a practical standpoint, the Water Quality BMPs for Pesticide Application are intended to reduce the loss of pesticides to the environment, save costs and increase profitability, reduce development of herbicide resistant weeds, and encourage the efficient use of herbicides, chemistry-rotation, and non-chemical approaches to weed control.

The core Best Management Practices (BMPs) are provided as a series of voluntary options. Producers, crop consultants and educators should select options that are most appropriate for a given agriculture operation, soil types, geology, tillage and cultivation practices, and irrigation and runoff management. The ISDA encourages each Idaho agriculture operation to follow the NRCS 595 Pest Management Standard. BMPs taken from the 595 Standard are bolded in the table below. Always read the product label. Label use requirements and application setbacks are legally enforceable.

Water Quality Best Management Practices for Pesticide Application		
Core BMP	**Description**	**Benefit**
1. Scout fields for pests and match the management approach to the specific pest problem.	Scout for pests, then map infestations throughout the year. Work with a crop consultant or other agriculture professional to determine how to best control targeted pests. Determine whether pest control will result in significant crop yield benefits. Carefully match pest control options, including non-chemical control such as **cultural and biological methods**, to pest pressures. Consider post-emergent weed control alternatives.	The benefit of using scouting includes lower costs and prevention of water resource impacts by responding accurately to specific weed pressures, using post-emergent control and using alternative chemical and non-chemical controls, such as cultivation.
2. Determine the soil type and depth to ground water in your fields and consider protective practices in vulnerable areas.	**Consider site characteristics such as soil, geology, water filtration, depth to water table, proximity to surface water, topography and climatic conditions.** Work with crop consultants, NRCS field office staff, and other agriculture professionals to determine characteristics of your field. Follow label requirements or recommendations for soil type and shallow water tables when applicable. **Know the location of sensitive resources along with setbacks (if applicable) near application site. Assure that the pesticide applicator knows the exact location of the area to be treated and the potential hazard of spray drift or subsequent pesticide movement onto surrounding areas. Contact NRCS to use WinPST to evaluate the potential for pesticides to move with water and eroded soil/organic matter on your fields.**	Reducing pesticide use in sensitive areas reduces the potential for ground water and surface water contamination. Adhering to label ground water advisories and exclusions reduces the potential for aquifer pollution.
3. Evaluate reduced pesticide application rates.	Work with a crop consultant or other agriculture professional to evaluate a reduced-rate pesticide program. Consider banding, if appropriate, which can significantly reduce pesticide inputs, especially in ridge-till locations. Check the label for application rate appropriate for soil type of your fields. Work with a crop consultant or other agriculture professional to determine if using the lowest labeled application rate in a "rate-range" is appropriate, keeping in mind that too low of a rate can be a factor in pest resistance. Start on a small area to test what works best on your farm. Be prepared for follow-up weed management including post-emergent pesticide application, rotary hoeing, or inter-row cultivation.	In many cases, the benefit of banding and a carefully planned reduced-rate pesticide program can result in effective weed control, reduced costs, and a reduction in pesticide loss to the environment.
4. Rotate pesticide modes of action, or chemistry.	Try to avoid more than two consecutive applications of pesticides with the same mode of action, or chemistry, to the same field. Evaluate this practice in the context of other effective control practices in the management system, such as use of tank mixes with multiple modes of action, crop rotation, periodic use of herbicide-resistant crops in a rotation, mechanical weed control, and field scouting.	The benefit of this practice serves to reduce the development of herbicide resistance in weeds or weed species shifts, and, in the long run, can help reduce the potential of ground water contamination from a particular pesticide.

Water Quality Best Management Practices for Pesticide Application		
Core BMP	**Description**	**Benefit**
5. Consider using precision application of pesticides.	Precision application of pesticides, such as spot spraying or use of variable rate technologies, is based on weed scouting and variation in soil properties, such as organic matter and texture. Adjust the pesticide application rates according to weed pressures and soils information.	The benefit of using precision applications is that less total pesticide is applied when compared to broadcast applications, which means less potential loss to the environment and reduction of costs.
6. Develop an Irrigation Water Management Plan.	If you irrigate, implement a water management scheduling plan that uses a soil probe, rain gauge, daily crop water use estimations, and a soil water balance worksheet. **Irrigation water should be managed to avoid conditions conducive to disease development and to minimize pest management environmental risks.**	Implementing an effective irrigation water management plan reduces leaching of chemicals into the ground water.
7. Properly calibrate and maintain all pesticide application equipment.	Calibration of application equipment is an important first step in minimizing risk of contaminating water resources. **Calibrate equipment before mixing and loading pesticides. Calibrate equipment at the beginning of each season, periodically during the season, and with each major pesticide change. Since nozzle wear increases application rate and can alter spray patterns, calibration should be checked regularly during the spray season.** Use the right nozzle for the job, and replace nozzles that are too small, too large or worn. **Replace worn nozzle tips, cracked hoses and faulty gauges.** Operate nozzles at the appropriate pressure. Be aware that unnecessarily high pressure increases nozzle wear and the possibility of pesticide drift.	The benefits of properly calibrate pesticide equipment include proper pest control, reduction of the potential of leaching chemicals to the ground water, and reduction of costs.
8. Minimize the impacts of mixing and loading activities on ground water.	**Locate all pesticide mixing areas and storage and supply areas (tanks) at least 150 feet away from any well or surface water body, and down slope of wells. Prevent the contamination of water supplies by keeping the filler hose or pipe out of the spray tank at all times.** Leave a 2" air gap between the hose and the tank to prevent back-siphoning. **Install an anti-siphon device to prevent backflow. Never leave a spray tank unattended during filling.** Clean up pesticide spills immediately, no matter the size.	The benefits of properly mixing and loading include reduction of back-siphoning chemicals into the ground water, as well as reduction in spills that could leach chemicals into the ground water.