



## Water Quality Best Management Practices for Acetochlor

The Minnesota Department of Agriculture (MDA) has developed voluntary Best Management Practices (BMPs) to address the presence of acetochlor and its breakdown products in Minnesota’s groundwater and surface water from normal agricultural use. If the BMPs are proven ineffective, mandatory restrictions on herbicide use and practices may be required. The BMPs may also refer to mandatory label use requirements. Always read product labels. To learn more about on the monitoring results for acetochlor and other pesticides in Minnesota’s water resources, refer to the MDA’s Monitoring and Assessment webpage: [www.mda.state.mn.us/monitoring](http://www.mda.state.mn.us/monitoring).

The acetochlor BMPs are companions to a set of core [BMPs for use with all agricultural herbicides](#). Herbicide-specific BMPs have also been developed for use with atrazine, metolachlor and metribuzin. If you use any of these herbicides in the production of crops, be sure to consult each herbicide-specific BMP prior to application. State and federal law can require that the use of a pesticide be limited or reduced due to the potential for adverse impacts on humans or the environment.

### Information about ACETOCHLOR

- Acetochlor belongs to “Site-of-Action (SOA) 15 herbicides” that control weeds by inhibiting the synthesis of very long chain fatty acids. Other herbicides in this class include dimethenamid, flufenacet, metolachlor, and pyroxasulfone. Herbicides in this class should be considered in the context of an Integrated Weed Management (IWM) Plan. All SOA 15 herbicides have similar potential to contaminate water resources.
- Acetochlor has properties that may result in surface water contamination from runoff or erosion. It has been found in Minnesota surface water at concentrations of concern (above the Minnesota chronic aquatic life standard). Violations of the surface water standard for acetochlor resulted in Minnesota streams being placed on the state’s list of impaired waters. Visit [www.pca.state.mn.us/water/tmdl](http://www.pca.state.mn.us/water/tmdl) for a list of impaired streams in Minnesota.
- Acetochlor has properties similar to other pesticides that are frequently detected in groundwater ([www.mda.state.mn.us/monitoring](http://www.mda.state.mn.us/monitoring)). Its use in areas where soils are permeable such as coarse textured soils, particularly where the groundwater is shallow, may result in groundwater contamination. Detections of acetochlor breakdown products are common in such areas, though concentrations are low relative to current drinking water guidelines.

Certain soils, regions and watersheds are more vulnerable to losses of acetochlor. Sensitive areas include those with highly permeable geologic material, highly erodible soils or seasonally high water tables (including areas with drain tiles). Note that portions of every Minnesota county may include one or more of these conditions.

Contact your Natural Resources Conservation Service or Soil and Water Conservation District for further information on specific soil and water resource conditions on and near your farm. Then work with crop consultants and educators to select and adopt the Best Management Practices that are appropriate for your field and farm.

Example trade names for products and package mixtures containing acetochlor.

ACETOCHLOR IS AN ACTIVE INGREDIENT IN	
Breakfree products	SureStart products
Cadence products	Surpass products
Confidence products	Tripleflex products
Harness products	Overtime
Keystone products	Volley products
Staunch	Warrant products

List is not all- inclusive and can change with the introduction of new products; always check the label, or consult the MDA’s product registration database at <http://ppis.ceris.purdue.edu/> and search for Active Ingredient.

Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement is implied.

The BMPs are provided as a series of options. Producers, agronomists, and educators should select those practices that are the most appropriate for a given farming operation, soil types and geography, tillage and cultivation practices, and irrigation and runoff management. The MDA encourages development of Integrated Weed Management Plans for every Minnesota farm. **Always read the product label. Label use requirements and application setbacks are legally enforceable.**

## Water Quality Best Management Practices for Acetochlor to be Used in Conjunction with MDA's Core "BMPs for All Agricultural Herbicides"

Acetochlor– Specific Practice*	Description	Benefit
1. Adopt the core "BMPs for All Agricultural Herbicides" when applying acetochlor.	Minnesota Department of Agriculture's core "BMPs for All Agricultural Herbicides" are designed as the baseline set of options to mitigate or prevent losses of herbicides to water resources. The core BMPs are available at <a href="http://www.mda.state.mn.us/herbicidebmps">www.mda.state.mn.us/herbicidebmps</a>	Adoption of core BMPs, along with those specific for acetochlor, and adherence to mandatory label use requirements and application setbacks can reduce runoff or leaching.
2. Diversify the use of SOA 15 herbicides or acetochlor-based products and review each product label for groundwater protection.	<p>Limit the use of acetochlor to one application per crop season. Carefully review acetochlor product labels and adjust application rates of acetochlor based on soil texture, soil organic matter, and weed pressure. Rotate acetochlor with other SOA 15 herbicides like metolachlor, pyroxasulfone, dimethenamid, or with herbicides other than SOA 15 when making multiple applications of residual herbicides (e.g. PRE followed by early POST). In soybeans, if you are following layering of residual herbicides to control herbicide resistant weeds, preferentially consider application of SOA 15 herbicides as an Early POST application (see label for crop height restrictions).</p> <p><b>Groundwater protection:</b> If you have a well on or near your farm, review soil properties and depth of water table at your farm before acetochlor application. Acetochlor product labels carry application restrictions within 50 feet of wells (including uncapped abandoned wells and drainage wells) if soil type meets certain texture, organic matter, and groundwater depth combinations. Also, do not mix or load acetochlor within 50 feet of wells (including abandoned wells and drainage wells) and sink holes.</p>	<p>Applying the herbicide at right time and right rate improves weed control and reduces herbicide losses to surface and groundwater.</p> <p>Diversification of SOA 15 herbicides and proper acetochlor application rates means delay in resistance in weeds and effective weed control with minimal risk to water resources.</p>
3. Maintain an application setback from surface water, tile inlets, wells, and sinkholes.	<p>An acetochlor application setback protects water quality by maintaining an area adjacent to water resources where acetochlor is not applied. Establishing vegetative filter strips in application setback areas is recommended to increase filtering of runoff (see BMP #5). Aerial application of acetochlor is not allowed in Minnesota.</p> <p>Do not mix or load acetochlor within 50 feet of perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs.</p> <p>When acetochlor is applied with atrazine, the atrazine label prohibits product application within 50 feet from wells and sinkholes, 200 feet from lakes and reservoirs, and 66 feet from points where runoff enters streams and rivers. Points where runoff enters a stream or river may include side inlets or tile inlets. When acetochlor is not applied with atrazine, voluntarily following these application setbacks is a good guide for water quality protection.</p> <p>Pesticide applicators should note the location of surface water, side inlets, tile inlets, wells, and sinkholes before making applications. Tile inlets include riser pipes, open inlets, and rock inlets.</p>	Protects vulnerable streams, rivers, lakes, and reservoirs from acetochlor impacts.
4. Soil incorporate acetochlor.	Evenly incorporate preplant applications of acetochlor to the depth recommended on the product label. Improper incorporation, excessive crop residues, or poor soil tillage may result in erratic, streaked, or otherwise unsatisfactory weed control. Combining soil incorporation of acetochlor with another tillage operation will avoid additional field passes and reduction of crop residue cover. Soil incorporation may not be compatible with conservation tillage systems which maintain high levels of surface crop residues – in such cases, producers need to determine which practice is the most appropriate for their operation.	Incorporated acetochlor is less likely to be lost in runoff and reach nearby streams, lakes, and tile inlets.
5. Maintain vegetative filter strips between areas where acetochlor is applied and points where field runoff enters surface water, tile inlets, and sinkholes.	<p>A 30-foot minimum width is recommended for vegetative filter strips except in watersheds listed as impaired for acetochlor<sup>1</sup>. In impaired watersheds, a 66-foot minimum width is recommended.</p> <p>A 30-foot wide vegetative filter strip complies with minimum criteria of Natural Resources Conservation Service Technical Standard 393, Filter Strip, for removal of sediment and sediment associated materials. A 66-foot width complies with the 60-foot minimum criteria of Technical Standard 393 for sediment, sediment associated and soluble materials, and is consistent with the recommendation to maintain a 66-foot setback between acetochlor applications and surface water (see BMP #3). <a href="https://efotg.sc.egov.usda.gov/references/public/MN/393mn.pdf">https://efotg.sc.egov.usda.gov/references/public/MN/393mn.pdf</a></p> <p>Depending on site conditions, both widths may be eligible for financial assistance through USDA programs. Landowners are encouraged to use minimum width recommendations as a guide and maintain as wide a vegetative filter strip that is practical for a site. In general, vegetative filter strip effectiveness increases with width and any vegetative filter strip is better than none. Soil and Water Conservation District and Natural Resources Conservation Service staff can be consulted for site-specific filter strip design.</p> <p>Minnesota shoreland rules require agricultural land within specified distances of public waters to be maintained in permanent vegetation or operated under an approved conservation plan (Minnesota Rules, Chapter 6120). Contact your county zoning administrator for details.</p>	Protects vulnerable streams, rivers, lakes, reservoirs, and groundwater from acetochlor runoff.
6. Reduce acetochlor use by using other weed control methods.	<p>Reduce the amount of acetochlor used on a farm operation by using alternative weed control methods. Options include:</p> <ol style="list-style-type: none"> <li>1. Chemical control with non-acetochlor herbicides;</li> <li>2. Cultural control like cover crops, crop rotation, delayed planting, etc.</li> <li>3. Mechanical cultivation including rotary hoe and inter-row cultivation.</li> </ol> <p>Scout fields and select a weed control program that is effective on targeted weeds. Product labels, certified crop consultants, and University of Minnesota Extension educators can be consulted in selecting weed control options. Report any incident of herbicide failure to the product registrant or an Extension Educator.</p>	Using alternative weed control methods lowers the risk of acetochlor runoff into streams and lakes by reducing the total amount of acetochlor used in a watershed.
7. Adopt conservation tillage practices appropriate for your farm's topography and in SE Minnesota karst areas.	<p>Conservation tillage leaves 30% or more of the soil covered with crop residue after planting and can include such methods as strip till, ridge till, mulch till, and no-till. Strip till and ridge till have been found to be effective on soils that warm too slowly with no-till.</p> <p>Soil and Water Conservation District, University of Minnesota Extension, and Natural Resources Conservation Service staff can be consulted on conservation tillage guidelines.</p>	Controlling loss of soil and runoff helps reduce acetochlor losses to surface waters.
8. Adopt spray drift management and precision application methods.	Adopt spray drift management practices given on product label on nozzle selection, weather conditions, spray boom height etc. to reduce acetochlor drift to off-target sites. Precision application of herbicides includes auto-steer, auto-boom shutoff, and variable rate technology. These practices can reduce unnecessary herbicide use resulting from overspray, spray overlap, and higher than recommended application rates.	Spray drift management and precision applications assure the right rate is applied in the right place.

\* For practices related to the use of specific herbicides refer to MDA's herbicide-specific Best Management Practices. All BMPs are available at [www.mda.state.mn.us/herbicidebmps](http://www.mda.state.mn.us/herbicidebmps). See "Additional Information and References" on "BMPs for All Agricultural Herbicides" to access detailed guidance on all recommended practices.

<sup>1</sup>In 2016, the Minnesota Pollution Control Agency included one water body on the state's 303(d) TMDL List of Impaired Waters due to acetochlor; Silver Creek located in central Minnesota. Water bodies listed as impaired require corrective actions to be taken by the state. More information on the state's impaired water program and a full listing of impaired waters is available at [www.pca.state.mn.us/water/tmdl](http://www.pca.state.mn.us/water/tmdl)

**Consider unintended consequences when selecting BMPs:**

The potential for unintended consequences should be considered when evaluating specific BMPs and other actions to protect and manage surface water or groundwater.



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