DEPARTMENT OF AGRICULTURE

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Water Quality Best Management Practices for Metolachlor

The Minnesota Department of Agriculture (MDA) has developed voluntary Best Management Practices (BMPs) to address the presence of metolachlor 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. For information on monitoring results for metolachlor and other pesticides in Minnesota's water resources, refer to the MDA's Monitoring and Assessment webpage: www.mda.state.mn.us/monitoring.

The metolachlor 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 acetochlor, atrazine, 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 curtailed due to the potential for adverse impacts on humans or the environment.

Example trade names for products and package mixtures containing metolachlor.

METOLACHLOR IS AN ACTIVE INGREDIENT IN		
S-metolachlor		metolachlor
Acuron	Lexar/Lumax	Helmet
Bicep II products	Matador	Metolachlor
Brawl	Pennant	Me-Too-Lachlor
Cinch products	Prefix	Parallel products
Dual products	Sequence	Stalwart products

List is not all-inclusive and can change with the introduction of new products; always check the label or consult MDA's product registration database at http://npirspublic.ceris.purdue.edu/state/, select Minnesota, 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.

Information about METOLACHLOR

- Metolachlor herbicide products are used on crops such as soybeans, corn, potatoes, tomatoes, sugar beets, and various vegetable crops. The crops that a given metolachlor product can be applied to varies, as does the concentration of active ingredient. Therefore, check the label carefully. Some metolachlor products contain a safener that enhances metolachlor detoxification by corn, reducing potential crop injury. These BMPs apply to all crops treated with metolachlor.
- Metolachlor has the potential to leach through soil into groundwater as a result of agricultural use. Groundwater contamination is more likely in areas with permeable soils, particularly where the water table is shallow. Metolachlor and its breakdown products are frequently detected in Minnesota groundwater and private wells.
- Metolachlor has the potential to runoff into surface water, primarily in runoff water or tile drainage, for several months post application. Surface runoff is more common on poorly drained, wet soils which slope toward adjacent surface waters. Metolachlor and its breakdown products are frequently detected in Minnesota surface waters.
- When metolachlor is manufactured, two forms (or isomers) are produced, S-metolachlor and R-metolachlor. S-metolachlor has greater herbicidal activity. Products differ in their content of these two forms of metolachlor. Products that list the active ingredient as "S-metolachlor" rather than "metolachlor" may improve weed control in difficult situations (high weed pressure, tolerant weed species, cold conditions, dry soils, late emerging weeds).

Certain soils, regions, and watersheds are more vulnerable to metolachlor loss. 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.

The BMPs are provided as a series of options. Producers, agronomists, and educators should select practices 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 Metolachlor
to be Used in Conjunction with MDA's Core "BMPs for All Agricultural Herbicides"

Metolachlor Specific Practice*	Description	Benefit
1. Adopt the core "BMPs for All Agricultural Herbicides" when applying metolachlor.	The 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 www.mda.state.mn.us/herbicidebmps	Adoption of core BMPs, along with those specific for metolachlor, and adherence to mandatory label use requirements and application setbacks can reduce runoff or leaching.
2. Utilize label application rates of metolachlor products.	Carefully review metolachlor product labels and adjust application rates of metolachlor based on soil texture, soil organic matter, weed species, and weed pressure.	Proper metolachlor application rates result in effective weed control and reduces herbicide losses to surface and groundwater.
3. Maintain required application setbacks from surface water, wells, and sinkholes to protect water resources from metolachlor runoff, drift, and leaching.	**Surface water protection:** Setbacks protect water quality by maintaining an area adjacent to water resources where metolachlor is not used. Do not mix or load metolachlor within 50 feet of perennial or intermittent streams and rivers, and natural or impounded lakes and reservoirs. If metolachlor is applied with atrazine, the atrazine label prohibits product application 200 feet from lakes and reservoirs and 66 feet from points where runoff enters streams and rivers. **Groundwater protection:** Maintain an area adjacent to entry points to groundwater where metolachlor is not applied. Do not mix, load, or apply metolachlor within 50 feet of wells, including abandon wells, drainage wells, and sink holes.	Protects vulnerable streams, rivers, lakes, reservoirs, and groundwater from metolachlor impacts.
4. Soil incorporate metolachlor.	Evenly incorporate preplant applications of metolachlor to the depth recommended on the product label. Improper incorporation, excessive crop residues, or poor soil tilth may result in erratic, streaked, or otherwise unsatisfactory weed control. Combine soil incorporation of metolachlor with another tillage operation to 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 – determine which practice is the most appropriate for a given operation.	Incorporated metolachlor is less likely to be lost in runoff and reach nearby streams, lakes, and surface tile inlets.
5. Combine and rotate use of metolachlor (and other site-of-action 15 herbicides) with herbicides from different sites-of-action.	Metolachlor is a site of action (SOA) 15 herbicide that control weeds by inhibiting the synthesis of very long chain fatty acids. Other herbicides in this class include acetochlor, dimethenamid, pyroxasulfone, and flufenacet. Implement a multi-year herbicide plan that combines and rotates herbicides with multiple sites of action that target the most troublesome or herbicide-resistance prone weeds. Do not over-rely on a single herbicide tolerant crop.	Reduces total loss of a particular herbicide to water resources. Reduces selection for herbicide resistant weeds or weed species shifts.
6. Reduce metolachlor use by using other weed control methods.	Reduce the metolachlor use on a farm operation by using alternative weed control methods. Options include: non-metolachlor herbicides, cultural controls (cover crops, crop rotation, delayed planting, etc.), and mechanical (tillage, mowing).	Using alternative weed control methods lowers the risk of metolachlor runoff into streams and lakes by reducing the total amount of metolachlor used in a watershed.
7. Adopt conservation tillage practices appropriate for your farm's topography and in SE Minnesota karst areas.	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. Consider strip till and ridge till on fields that warm too slowly with no-till.	Controlling loss of soil and runoff helps reduce metolachlor losses to surface waters.
8. Adopt spray drift management and precision application methods.	Adopt spray drift management practices given on the product label including nozzle selection, weather conditions, spray boom height, etc. to reduce metolachlor drift to off-target sites. Precision application of equipment such as auto-steer, auto-boom shutoff, and variable rate technology 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 See "Additional Information and References" for access to detailed guidance on all recommended practices.

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.

In accordance with the Americans with Disabilities Act, this information is available in alternative forms of communication upon request by calling 651-201-6000. TTY users can call the Minnesota Relay Service at 711. The MDA is an equal opportunity employer and provider. File Name: Water Quality BMP for Metolachlor.indd 3.8.22