

Water Quality **Best Management Practices** for ATRAZINE

July 2011

The Minnesota Department of Agriculture (MDA) has developed voluntary Best Management Practices (BMPs) to address the presence of atrazine and its breakdown products in Minnesota's groundwater and surface water from normal agricultural use (see reverse side of page for atrazine-specific BMPs). 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 atrazine and other pesticides in Minnesota's water resources, refer to the MDA's Monitoring and Assessment webpage:

www.mda.state.mn.us/monitoring

The atrazine 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, alachlor, 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 applying these herbicides. 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.

Information about ATRAZINE

- Atrazine is a Restricted Use Pesticide that can only be purchased and applied by properly licensed or certified individuals. All pre-mixes and tank mixes containing atrazine are also Restricted Use Pesticides.
- Atrazine can travel (seep or leach) through soil and can enter groundwater used as drinking water. Users are advised not to apply atrazine to sand and loamy sand soils where the water table (groundwater) is close to the surface and where these soils are very permeable. Atrazine and its breakdown products have been frequently detected in Minnesota groundwater beneath areas with coarse-textured soils.
- Atrazine can also be lost to surface water through field runoff, and has been found at concentrations of concern in Minnesota surface waters. Atrazine is toxic to aquatic invertebrates, and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas.
- Atrazine is a photosynthesis inhibiting herbicide that manages weeds through a particular mode of action (chemistry). When used in an Integrated Weed Management (IWM) Plan, its use should be considered jointly with other photosynthesis inhibiting herbicides. Use of herbicides with different modes of action (e.g., plant growth regulators, pigment inhibitors or sulfonyleurea herbicides), alone or in tank mixes, may be desirable in an IWM Plan to effectively control weeds while protecting the environment.



Certain soils, regions and watersheds are more vulnerable to losses of atrazine. 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.

Example trade names for products and package mixtures containing atrazine. 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://state.ceris.purdue.edu/doc/mn/state/mn.html> and search for Active Ingredient.*

Atrazine is an active ingredient in:

Aatrex	Confidence Xtra	Keystone
Atrazine	Degree Xtra	Lumax
Basis Gold	Expert	Overtime ATZ
Bicep II	Fieldmaster	Parallel Plus
Breakfree ATZ	Ful Time	Stalwart Xtra
Cadence ATZ	G-Max Lite	Steadfast ATZ
Callisto Xtra	Guardman Max	Tremor AT Lite
Cinch ATZ	Harness Xtra	Volley ATZ

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

Contact your Natural Resources Conservation Service or Soil & 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, crop consultants and educators should select options 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 (see “Additional Information and References” for more information*). **Always read the product label. Label use requirements and application setbacks are legally enforceable.**

Water Quality *Best Management Practices for ATRAZINE*

To be used in conjunction with MDA’s core “BMPs for All Agricultural Herbicides”

Atrazine-Specific Practice*	Description	Benefit
<p>1. Adopt the core “BMPs for All Agricultural Herbicides” when applying atrazine.</p>	<p>MDA’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</p>	<p>Adoption of core BMPs with those specific for atrazine and adherence to mandatory label use requirements and application setbacks result in opportunities for multiple water quality protection benefits.</p>
<p>2. Limit total atrazine use per year to 0.8 lbs of active ingredient per acre on coarse-textured soils by using premixes and tank mixes.</p>	<p>This practice is especially important on coarse-textured soils (e.g., where sand, loamy sand or sandy loam soil textural classifications make up more than 25% of the field). These soils are common in central Minnesota, but are also present in many other locations.</p>	<p>Effective weed control for many small-seeded broadleaf weeds can be obtained using premixes and tank mixes with low atrazine content. Lower rates mean less potential loss to water resources.</p>
<p>3. For Southeast Minnesota: Limit total atrazine use per year to 0.8 lbs of active ingredient per acre on all soils except on medium and fine textured soils, where a total of 1.0 lb of active ingredient per year can be used for pre-emergence weed control.</p>	<p>This practice is important on any soils in the following ten counties in southeastern Minnesota with karst geology and features: <i>Dakota, Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Rice, Wabasha and Winona</i>. The slightly higher rate of atrazine for pre-emergence applications on medium- and fine-textured soils is allowed to maintain efficacy of early season weed control and reduce potential losses from leaching and runoff.</p>	<p>Effective weed control for many small-seeded broadleaf weeds can be obtained using premixes and tank mixes with low atrazine content. Lower rates mean less potential loss to water resources.</p>
<p>4. Evaluate surface drainage patterns in your field, then identify points where surface runoff leaves the field and consider protective practices in vulnerable areas, including tile inlets, wells and sinkholes; follow label requirements for application setbacks and planted buffers.</p>	<p>Work with crop consultants and other ag professionals. Identify and implement appropriate label-required setbacks and planted buffers for your farm. Atrazine, and premixes or tank mixes containing atrazine, may not be applied within 66 feet of the points where runoff enters perennial or intermittent streams and rivers, within 200 feet around natural or impounded lakes and reservoirs, or within 50 feet of wells or sinkholes. Setbacks or buffers could also be adopted around surface inlets on tile-drained fields for further water quality protection benefits.</p>	<p>Protects vulnerable wells, sinkholes, streams, rivers, lakes and reservoirs from atrazine impacts.</p>
<p>5. Adopt conservation tillage practices appropriate for your farm’s topography and in SE Minnesota karst areas.</p>	<p>Conservation tillage controls soil erosion that can contribute to losses of atrazine attached to soil particles during field runoff events and from fields with tile drain surface inlets. It also helps slow movement of water across the landscape when atrazine is dissolved in runoff water. Consult your Natural Resources Conservation Service and Soil & Water Conservation District offices for current tillage guidelines.</p>	<p>Controlling loss of soil and runoff helps reduce atrazine losses to surface waters.</p>
<p>6. Rotate use of atrazine (and metribuzin and other photosynthesis inhibiting herbicides) with herbicides from a different chemical class.</p>	<p>Evaluate this practice in the context of other effective control practices in the management system (e.g., use of tank mixes with multiple modes of action; crop rotation; planned, periodic use of herbicide-resistant varieties in a rotation; mechanical weed control; field scouting). Determine which crop in the rotation is in greatest need of photosynthesis inhibiting herbicides, and reserve their use for that crop.</p>	<p>With time, this practice will reduce development of herbicide resistant weeds or weed species shifts, and means less annual availability of these herbicides for loss to the environment.</p>

*BMPs related to the use of other specific herbicides and for all agriculture herbicides are available at www.mda.state.mn.us/herbicidebmps
See “Additional Information & References” on “BMPs for All Agricultural Herbicides” to access detailed guidance on recommended practices.