



Water Quality Best Management Practices for Atrazine

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. 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, 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 is a preemergence and postemergence herbicide for control of many annual broadleaf and some grass weeds in corn.
- Atrazine is moderately persistent in the soil. As a result, it is subject to field loss for a longer time period.
- Atrazine can leach downward through the soil profile and enter groundwater used as drinking water. Users are advised not to apply atrazine to permeable soils (sands, loamy sands, and sandy loams) where the water table (groundwater) is close to the surface. Atrazine and its breakdown products have been frequently detected in Minnesota groundwater in 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 runoff into adjacent surface water can reduce growth of algae and aquatic vegetation and can also be toxic to other aquatic organisms.
- Atrazine controls weeds by inhibiting photosynthesis; herbicide site of action 5. Combine and rotate atrazine with other effective herbicides with different sites of action as part of a multi-year Integrated Weed Management (IWM) Plan to obtain acceptable control while protecting the environment and avoiding selection for herbicide resistance.

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.

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.

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.

Example trade names for products and package mixtures containing atrazine.

ATRAZINE IS AN ACTIVE INGREDIENT IN		
Aatrex	Cinch ATZ	Lumax/Lexar
Acuron	Confidence Xtra	Overtime ATZ
Atrazine	Degree Xtra	Parallel Plus
Bicep II Magnum	FulTime	Slider ATZast ATZ
Cadence ATZ	Harness Xtra	Tremor AT Lite
Callisto Xtra	Keystone	Volley ATZ

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.

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
1. Adopt the core “BMPs for All Agricultural Herbicides” when applying atrazine.	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	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.
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.	Utilize herbicide tank mixes which result in lower atrazine use rates. This practice is especially important on coarse-textured soils - sands, loamy sands, and sandy loam soils - which are more prone to leaching. These soils are common in central Minnesota, as well as other areas of the state	Herbicide tank mixes can provide effective weed control while using less atrazine. This reduces the potential leaching loss of atrazine.
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.	Surface water contaminants can move quickly to groundwater through karst features such as sinkholes. This practice is important on any soils in the following ten counties in southeastern Minnesota with karst geology: Dakota, Dodge, Fillmore, Goodhue, Houston, Mower, Olmsted, Rice, Wabasha and Winona.	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.
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.	Work with an agronomist to identify and implement appropriate label-required setbacks and planted buffers for each field. Atrazine, including premixes and tank mixes, cannot be: <ul style="list-style-type: none"> - applied within 66 feet of points where runoff enters perennial or intermittent streams and rivers. If the area is highly erodible, it must be seeded with grass or other suitable crop. - applied within 200 feet of natural or impounded lakes and reservoirs. - mixed or loaded within 50 feet of streams, lakes, or reservoirs. - mixed, loaded, or applied within 50 feet of wells (active or abandoned) or sinkholes. - applied within 66 feet of tile surface inlets unless immediately incorporated to a 2-3 inch depth or used in a no-till crop system. 	Protects vulnerable wells, sinkholes, streams, rivers, lakes and reservoirs from atrazine contamination.
5. Adopt conservation tillage practices appropriate for your farm’s topography and crops.	Conservation tillage decreases soil erosion during field runoff events which can reduce losses of atrazine attached to soil particles. It also reduces the loss of dissolved atrazine in surface runoff water and through tile drain surface inlets. It also helps slow movement of runoff water and dissolved atrazine across the landscape.	Controlling loss of soil and runoff helps reduce atrazine losses to surface waters.
6. Combine and rotate use of atrazine (and other site-of-action 5 herbicides) with herbicides from different sites-of-action in conjunctions with nonchemical methods.	Evaluate this practice in the context of other effective control practices in the management system (e.g., use of tank mixes with multiple sites 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.	Reduces selection for herbicide resistant weeds or weed species shifts. Less atrazine is available for potential loss to the environment.

* 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.