

ALTERNATIVES TO ATRAZINE IN WATER SENSITIVE SITES

W. W. Witt, J. D. Green, and J. R. Martin
Department of Agronomy, University of Kentucky

Atrazine has provided consistent, cost-effective weed control in corn for the past 40 years. It is widely used in Kentucky and about 85% of the corn in Kentucky is treated with this herbicide. Label changes for all atrazine-containing products have occurred in an effort to prevent surface and ground water contamination. Initial label changes in 1990 classified all atrazine-containing products as "Restricted Use Pesticides" due to ground and surface water concerns. Current labels of atrazine-containing products emphasize the use of low atrazine rates, buffer zones, and conservation tillage practices.

Corn growers may need to use other herbicides for weed management because of these restrictions. Several herbicides are available to control the same weeds as atrazine. However, these herbicides may not be as flexible as atrazine and typically, these herbicides will be more expensive than atrazine.

Weed Management Options

The following comments pertain to selecting alternatives to atrazine in water sensitive sites only. Atrazine can be used safely and legally in many fields and remains a viable option for corn weed control.

However, some fields, or portions of fields, may be too near a water source that would preclude the use of atrazine. In such sites, other weed management options should be utilized.

Excluded from consideration were soil-applied herbicides that are "Restricted Use Pesticides" because of potential water contamination. In addition, simazine containing products were excluded because it is very similar to atrazine. A metabolite of simazine can be confused with an atrazine metabolite during the testing of water for atrazine and its metabolites.

There are two general strategies to use when selecting atrazine alternatives. These are:

- 1) Use herbicides applied to the soil followed by those applied to foliage (postemergence)
- 2) use only postemergence herbicides

One advantage of combining soil-applied and foliarly-applied herbicides is that the grower has a longer "window of application" since the soil herbicides will control many annual grasses and small-seeded broadleaf weeds. Morningglories and giant ragweed are not controlled effectively with soil-applied herbicides (Table 1). Herbicides to control these weeds are available but these must be applied to the weeds after emergence. Postemergence herbicides must be applied in a timely manner for effective weed control. More than one treatment is needed frequently when using only postemergence herbicides. This need for timeliness will require a greater degree of management. The more acres that must be treated the greater the importance of being able to apply postemergence herbicides in a timely manner.

Table 1. Comparison of herbicides to atrazine for corn weed management.¹

Herbicide Option	Cost (\$/A) ²	Corn Injury ³	Relative Control Rating ³				Comments
			Cockle -bur	Pigweed	Morning-glories	Giant Ragweed	
Atrazine ⁴	4.50	0	9	9	8	8	Standard for comparison
PREEMERGENCE							
Axiom	18.90	1	4	9	4	4	Poor control of larger seeded broadleaves
Hornet WDG	13.50	1	9	9	7	6	Fair control of morningglories and giant ragweed
POSTEMERGENCE							
Accent Gold	22.25	3	8	8	6	7	Fair control of morningglories and giant ragweed
Beacon	19.00	3	8	8	6	9	Apply to corn <20" tall; do not apply to corn under stress
Callisto	11.25	2	8	8	6	8	Fair control of morningglories
Dicamba (Clarity, etc.)	8.50	2	9	9	9	9	Good overall control; avoid drift to sensitive crops
Distinct	11.75	2	9	9	8	9	Good overall control; avoid drift to sensitive crops
2,4-D	2.00	3	9	9	9	9	Apply to corn <8" tall; avoid drift to sensitive crops
Exceed	11.00	3	9	9	7	9	Better broadleaf activity than BEACON; similar to SPIRIT
Glyphosate (Roundup, etc.) [RR-corn] ⁵	10.00	0	9	9	8	8	Apply only to Roundup Ready corn hybrids; broad spectrum weed control
Lightning [CLEARFIELD-corn] ⁶	14.50	3	9	9	8	8	Apply only to Clearfield corn hybrids
Spirit	9.50	3	9	8	6	9	Slightly better broadleaf activity than BEACON; similar to EXCEED

¹ A combination PRE and/or POST herbicides may be needed for effective weed control.

² Does not include the cost of application.

³ Potential corn injury and weed control ratings are based on a scale from 0 to 9. A rating of 3 or less will not reduce corn yield under normal conditions; better weed control should be expected with higher rating values.

⁴ Products available in Kentucky for 2004 that contain atrazine include AAtrex, Basis Gold, Bicep II Magnum, Degree Xtra, FieldMaster, FulTime, Guardsman Max, Harness Xtra, Keystone, LeadOff, Liberty ATZ, Lumax, Marksman, ReadyMaster ATZ, Simazat, Sterling Plus, Stratos, and others.

⁵ Apply only on corn hybrids designated with Roundup Ready technology. Additional seed costs may be associated with use of these hybrids.

⁶ Apply only on corn hybrids that are tolerant to Lightning (i.e. designated with the CLEARFIELD technology) or severe corn injury will occur.