



Conservation Systems Research

Valor – A Residual Herbicide for Weed Control in Conservation Tillage Cotton Systems

CONSERVATION SYSTEMS FACT SHEET NO. 02

United States
Department of
Agriculture

Agricultural
Research
Service

National Soil
Dynamics
Laboratory

Conservation
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Conservation
Systems
Fact
Sheet
No. 02

January, 2005

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Cotton growing in a desiccated winter wheat cover. Wheat is widely used in Southern USA conservation-tillage systems.

Herbicides are often used in conservation-tillage cotton systems to desiccate (burn-down) winter cover crops and to control weeds, both before planting cotton and during the season. Valor® (flumioxazin) has been registered for both pre-plant burndown of cover crops and postemergence-directed spray application in cotton, in which the herbicide is sprayed below any green cotton tissue that may be damaged. It will also provide residual weed control not provided by common burndown herbicides such as glyphosate or paraquat.

While Valor offers both preplant burndown and residual weed control, cotton injury due to herbicide applications has been reported by researchers when the application is made less than 30 days before planting. Current labeling requires waiting to plant cotton at least 30 days after Valor application to avoid cotton injury.

Valor also has the potential to injure cotton if the herbicide comes in contact with green tissue. Current labeling requires that postemergence-directed spray applications of Valor be made when cotton is at least 18 inches tall and has at least 4 inches of bark. To avoid injury, the postemergence-directed spray application must be made to the bottom 2 inches of bark, with no spray hitting the foliage.

Several studies were conducted in North Carolina from 1999-2002 to:

1. Evaluate Valor effectiveness as a preplant burndown and weed control alone and mixed with glyphosate or paraquat; and
2. Address cotton injury concerns for preplant burndown and postemergence-directed spray applications.

Valor For Preplant Burndown and Weed Control

In one study, paraquat, glyphosate, Valor, Valor plus paraquat, and Valor plus glyphosate were applied 4–6 weeks before planting for cover crop (wheat) desiccation and early-season weed control. Glyphosate or paraquat alone provided winter-cover burndown, but did not have the desired residual weed control. Valor alone provided residual weed control but did not adequately kill the wheat cover. Valor mixed with either glyphosate or paraquat provided the most effective control of both the wheat cover and early-season weeds. No significant cotton injury or yield reduction was noted for any of the herbicide treatments, suggesting that all are safe for use at least 30 days before planting cotton.

Another study evaluated preplant burndown application timing relative to cotton planting to assess cotton injury. Valor, glyphosate, and Valor plus glyphosate treatments were applied at 30, 21, 14 and 0 days before planting. None of these treatments showed significant cotton injury or yield reduction.

In a third study, Valor was applied as a preplant burndown at 28, 14, and 7 days before planting. When the cotton seedlings emerged, irrigation water was applied. Valor applied 28 days before planting resulted in no cotton injury. Valor applied 14 and 7 days before planting caused minor cotton damage but no yield reductions. Again, the label directs preplant burndown applications be made 30 days before planting.

Valor For Postemergence Directed Spray Application

Because contact of Valor with green cotton tissue can result in plant injury, splashing due to rainfall or irrigation after cotton emergence was a concern. A study evaluated postemergence-directed spray application of Valor, followed by irrigation. No cotton damage from Valor was found when applied according to label directions.

Conclusions

Valor plus glyphosate and Valor plus paraquat mixes provided effective cover crop desiccation and weed control in conservation-tillage cotton systems. Cotton injury from Valor was not agriculturally significant in any of these studies when applied following the label. Similarly, there were no significant yield reductions from any of the treatments studied, suggesting that Valor is a safe and effective herbicide for preplant burndown and postemergence-directed spray applications in cotton when label directions are followed.

Related Publications

Price, A.J., W.A. Pline, J.W. Wilcut, and J.R. Cranmer. 2004. Physiological basis for cotton tolerance to flumioxazin applied postemergence directed. *Weed Sci.* 52:1-7.

Price, A.J., J.W. Wilcut, and J.R. Cranmer. 2004. Flumioxazin preplant of POST-directed application timing followed by irrigation at emergence or after POST-directed spray treatment does not influence cotton yield. *Weed Technol.* 18:310-314

Price, A.J., J.W. Wilcut, and J.R. Cranmer. 2002. Flumioxazin preplant burndown weed management in strip-tillage cotton (*Gossypium hirsutum*) planted into wheat (*Triticum aestivum*). *Weed Technol.* 16:762-767.