

# ALION, a new herbicide for broad-spectrum weed management in Florida citrus

By Stephen H. Futch and Megh Singh

**A**lion 200 SC (indaziflam) is a promising new herbicide under development by Bayer Crop-Science for use in perennial agricultural crops such as tree nuts and vines, citrus, stone and pome fruits. Federal registration for this herbicide has been approved for the above crops by the Environmental Protection Agency, with anticipated state registration this summer or fall. This new herbicide is for the pre-emergence control of broad-leaf weeds (pulse, pigweed, Spanish needle and ragweed), annual grasses (guineagrass, goosegrass and crow-footgrass) and various vine species.

Alion 200 SC belongs to the alky-lazine chemical class of herbicides and is classified as a Herbicide Resistance Action Committee (HRAC) group 1 herbicide. It inhibits cell wall biosynthesis and acts on the meristematic cell growth. This combined action severely affects cell wall formation, cell elongation and division, thereby affecting survivorship of germinating weeds prior to emergence.

Alion is primarily a pre-emergence herbicide; however, it can be applied in a post-emergence tank mix with various tank-mix partners such as glyphosate. Alion does not provide post-emergence weed control. To maximize weed control, it should be applied to relatively clean ground void of emerged weeds or mixed with post-emergence products, if weeds are present. If excessive weeds are present, the treated area should be cleaned up with a post-emergence product prior to the application of Alion.

Multiple studies have been conduct-

**Table 1.** Observed overall weed control percentage by a variety of tank-mixed herbicides in a St. Lucie County citrus grove

Trt#	Material applied	Rate	30 DAT <sup>2</sup>	60 DAT	90 DAT	120 DAT
1	Roundup Weather Max Choice	44 oz/acre 0.25% v/v	98 a	75 b	35 b	23 b
2	Roundup Weather Max Alion Choice	44 oz/acre 3.5 oz/acre 0.25% v/v	99 a	98 a	88 a	64 ab
3	Roundup Weather Max Alion Choice	44 oz/acre 5 oz/acre 0.25% v/v	99 a	98 a	95 a	89 a
4	Roundup Weather Max Karmex 80DF Choice	44 oz/acre 2 lb/acre 0.25% v/v	98 a	97 a	90 a	83 a
5	Roundup Weather Max Alion Choice	44 oz/acre 6.5 oz/acre 0.25% v/v	99 a	98 a	90 a	83 a
6	Roundup Weather Max Krovar I Choice	44 oz/acre 3 lb/acre 0.25% v/v	99 a	98 a	96 a	63 ab
7	Roundup Weather Max Solicam Karmex Choice	44 oz/acre 3 lb/acre 2 lb/acre 0.25% v/v	99 a	98 a	92 a	70 ab
8	Roundup Weather Max Prowl H <sub>2</sub> O Karmex 80DF Choice	44 oz/acre 7 pt/acre 2 lb/acre 0.25% v/v	99 a	97 a	85 a	59 ab

<sup>2</sup>Within a column, means followed by the same letter do not significantly differ ( $P=.05$ , Student-Newman-Keuls). DAT means days after treatment.

ed to evaluate weed control provided by Alion at various sites where young and mature citrus trees are being grown in Florida. To evaluate weed-control efficacy of Alion 200 SC, two trials were conducted in 2009 in young citrus groves located in St. Lucie and DeSoto counties. Alion 200 SC and

other pre-emergent materials tank mixed with glyphosate were compared. The St. Lucie grove consisted of 2-year-old red grapefruit trees planted on double row beds while the DeSoto location contained 1-year-old Valencia trees planted on single row beds. In both locations, the trees were grown on Swingle citrumelo rootstock. The row spacing at both locations was 12.5 x 25 feet. Both trials were conducted as a randomized complete block design with three replications and four trees per plot.

Observations on weed control were made at 30-day intervals from the date of herbicide treatment and visually rated as to the percent of weed control in each plot for each rating period. The rating scale used was 0 to 100 percent, with 0 percent representing the herbicide-treated test plot completely covered with weeds and 100 percent representing complete weed control (no weeds present in the plot).



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At the St. Lucie location, all tested materials were applied with a tractor-mounted herbicide boom system with a centrifugal pump system and the adjuvant Choice included in all treatments at 0.25 percent volume/volume (v/v). Application volume was 25 gallons per acre (gpa) applied at 30 pounds per square inch (PSI).

At the DeSoto location, plots were 12 feet x 36 feet. Treatments were applied with a hand-held boom using a CO<sub>2</sub> spraying system applying 30 gpa at 40 PSI.

Major weeds present at the St. Lucie location included torpedo grass, guineagrass, Bermuda grass, beggars tick (Spanish needle) and signalgrass. Major weeds present at the DeSoto location included guineagrass, crowfootgrass, crabgrass, beggars tick (Spanish needle) and balsam apple.

The results at the St. Lucie location revealed that compared to application of glyphosate alone, all tank-mix treatments with Alion provided excellent weed control at 60 days after treatment

**Table 2.** Observed overall weed control percentage by a variety of tank-mixed herbicides in a DeSoto County citrus grove

Trt#	Material applied	Rate	25 DAT <sup>2</sup>	54 DAT	88 DAT
1	Untreated		7 b	3 b	0 b
2	Roundup Weather Max	43 oz/acre	99 a	95 a	71 a
	Alion	5.13 oz/acre			
3	Roundup Weather Max	43 oz/acre	99 a	97 a	90a
	Alion	6.84 oz/acre			
4	Roundup Weather Max	43 oz/acre	99 a	98 a	75 a
	Solicam	3 lb/acre			
	Karmex	4 lb/acre			
5	Roundup Weather Max	43 oz/acre	98 a	98 a	92 a
	Prowl H <sub>2</sub> O	8 pt/acre			
	Karmex	4 lb/acre			

<sup>2</sup>Within a column, means followed by the same letter do not significantly differ (P=.05, Student-Newman-Keuls). DAT means days after treatment.

(DAT). The application of glyphosate in all treatments provided initial control, but with later ratings, differences were noted. Although no significant differences were observed, inclusion of Alion 200 SC in the tank mix improved weed control at 5 and 6.5 ounces (oz)/acre compared to Alion at 3.5 ounces/acre at 120 DAT (Table 1, page 18). Weed control at 120 DAT was higher for Alion 200 SC at the 5 and 6.5 oz/acre rate as compared to

the grower standard treatments of Krovar I, Solicam + Karmex, or Prowl H<sub>2</sub>O + Karmex with glyphosate in performance at the 5 and 6.5 oz rates. Alion 200 SC demonstrated that it could be an effective alternative to current grower practices. All tank-mix treatments with Alion provided longer-term weed control as compared to glyphosate alone, indicating the enhanced duration of weed control provided by the residual pre-emergent herbicide material.

At the DeSoto location, the tank mix of Alion 200 SC at 5.13 and 6.84 oz/acre provided 71 percent and 90 percent weed control at 88 DAT, respectively (Table 2). These results were very similar

to the grower's standards of Solicam + Karmex and Prowl H<sub>2</sub>O + Karmex. At this location, the untreated control was completely covered with weeds and had a 0 percent weed control rating at 90 DAT. However, at 88 DAT no significant differences were noted among the treatments that contained residual herbicide compounds. Alion provided a similar level of weed control compared with other herbicide regimes commonly used by growers.

The spectrum of weeds present at each location was different, which resulted in different overall weed control provided by the various herbicide treatments. As with any herbicide program, herbicide selection and rates may vary depending on location, weed species present, season and label restrictions. Future evaluations of Alion will have to consider these factors in the development of best management practices.

In general, these studies have shown that Alion, when fully registered, can be an additional herbicide option for Florida citrus growers to control both broadleaf and grass weeds due to its efficacy and residual control.

**Disclaimer:** The use of trade names in this communication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this communication does not signify our approval to the exclusion of other products of suitable composition.

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