MANAGEMENT OF VOLUNTEER COTTON WITH DUPLOSAN™

Dale A. Mott
Texas A&M AgriLife Extension Service
College Station, TX
Joshua McGinty
Texas A&M AgriLife Extension Service
Corpus Christi, TX[2]

Abstract

Duplosan™ (dichlorprop-p) is a herbicide labeled for perennial weeds, woody plants and brush control which has recently received a 24(c) SLN in Texas for cotton stalk destruction as it is effective at controlling both XtendFlex® and Enlist® traited cotton. Another potential use for this product is for management of volunteer cotton, either in the fall of the year following cotton harvest when being used for cotton stalk destruction or early spring prior to planting of a crop when the ground is fallow.

Trials conducted in College Station, TX in 2019 evaluated Duplosan on Phytogen 480 W3FE cotton at rates of 16, 24, and 32 fl oz/acre alone or a rate of 16 fl oz/acre in combination with Clash (dicamba) at 8 fl oz/acre and Weedone® LV4 EC (2,4-D) at 8.5 fl oz/acre or Panther SC (flumioxazin) at 2 fl oz/acre for control of volunteer cotton at 3 growth stages, cotyledon-2 true leaves (TL), 2-4 TL, and 5-6 TL stage alone or in combination with other products. Within any given herbicide mixture or rate, control of volunteer cotton was greatest with applications made to younger cotton. Within cotton growth stages, control was greater with higher rates of Duplosan. Also, the addition of Weedone LV4 EC and Clash or Panther SC to Duplosan improved control.

Introduction

Duplosan (dichlorprop-p) is a herbicide labeled for perennial weeds, woody plants and brush control which has recently received a 24(c) SLN in Texas for cotton stalk destruction as it is effective at controlling both XtendFlex® and Enlist® traited cotton. Another potential use for this product is for management of volunteer cotton, either in the fall of the year following cotton harvest when being used for cotton stalk destruction or early spring prior to planting of a crop when the ground is fallow.

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Materials and Methods

Cotton was planted on May 17, 2019 to PHY 480W3FE, a cotton variety that is tolerant to Enlist or 2,4-D herbicide. Plots were arranged in a RCB design, 4 rows by 40 feet by 40 inch row spacing. Three application timing of herbicides were applied, June 4, 11 and 20 to cotton that was at the cotyledon-2 true leaves (TLs), 2-4 TLs and 4-6 TLs, respectively, with a total of 14 treatments (Table 1).

Also included was an untreated check. In addition, crop oil concentrate at 1% was added to each treatment. The applications were applied using a 2 row, 2 nozzle per row, CO2-pressurized backpack sprayer calibrated to deliver 11 GPA at 3 MPH. Treatments were arranged in a randomized complete block (RCB) design and were replicated four times. Visual percent control was taking at 3 times, June 19, July 11 and July 31. Final percent regrowth, number of live plants per single row and number of hostable plants (number of plants that contained at least one, 1/3 grown square were collected on July 31.

Table 1. Treatment application timing and rates

Timing	Timing Code	Treatment #	Treatment*
4-Jun	Coty - 2 TL	1	Duplosan 16 fl oz
		2	Duplosan 24 fl oz
		3	Duplosan 32 fl oz
		4	Duplosan 16 fl oz & Clash 8 fl oz & Weedone LV4 8.5 fl oz
		5	Duplosan 16 fl oz & Panther 2 fl oz
11-Jun	2-4 TL	6	Duplosan 16 fl oz
		7	Duplosan 24 fl oz
		8	Duplosan 32 fl oz
		9	Duplosan 16 fl oz & Clash 8 fl oz & Weedone LV4 8.5 fl oz
		10	Duplosan 16 fl oz & Panther 2 fl oz
20-Jun	4-6 TL	11	Duplosan 24 fl oz
		12	Duplosan 32 fl oz
		13	Duplosan 16 fl oz & Clash 8 fl oz & Weedone LV4 8.5 fl oz
		14	Untreated Check

Figure 1. Photos of control, from application B timing treatments from 20DAA-B, July 1, 2019

Table 2. Information on plot design, College Station, TX.

Rows/plot	4
Row Length (ft)	40
Row Spacing (in)	40
Plant Date	17-May
Previous Crop	corn

Results and Discussion

Final percent regrowth is shown in Figure 2 for all the treatments across the 3 application timings. All treatment application across all timings had some regrowth except for the Duplosan @ 16 oz + Panther @ 2 oz for the Cotyledon- 2 TL application timing, which had no regrowth. Most of the treatments reduced regrowth compared to untreated check below 50 percent, except the 2 lower rates of Duplosan alone at the 2-4 TL application timing.

For application timing A, the 24 oz/a rates and higher of Duplosan alone or when the 16 oz rate was tank-mixed with Clash and Weedone or Panther herbicides, provided better percent control than 16 oz of Duplosan alone (Figure 3). The 16 oz rate of Duplosan looked promising at 16 DAA-A but the plants eventually grew out of the herbicide and by 58 DAA-A, mean control was about 45%.

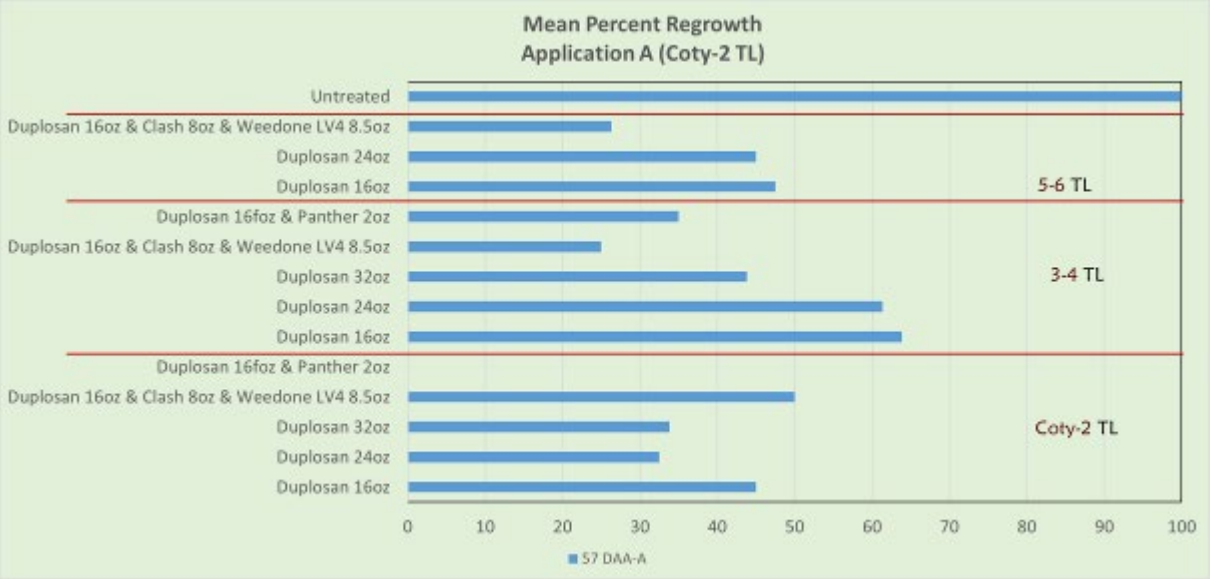

Figure 2. Mean percent final regrowth. College Station, TX. 2019.

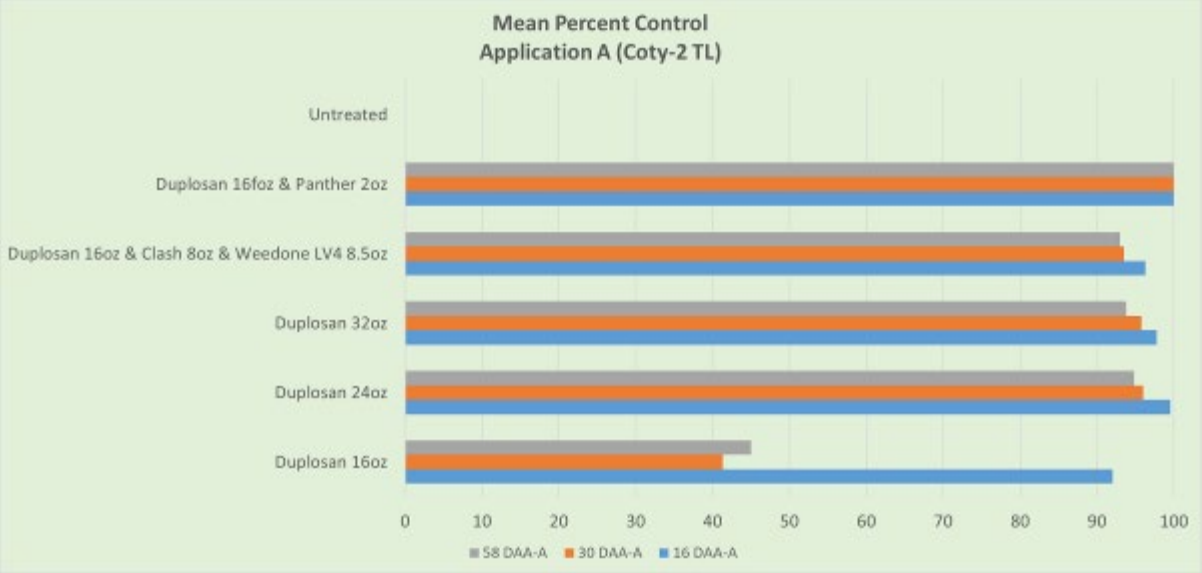

Figure 3. Mean percent control for application timing A. College Station, TX. 2019.

For application timing B, the Duplosan @ 16 oz + Panther @ 2 oz rate provided the best overall control, with control at 98% at 51 DAA-B (Figure 4) that was followed by Duplosan @ 16 oz + Clash @ 8 oz + Weedone @ 8.5 oz which resulted in 92% control at 51 DAA-B. The Duplosan @ 16 oz resulted in just over 50% control at 51 DAA-B.

None of the treatments at the C application timing provided a good level of control. (Figure 5). Duplosan @ 16 oz + Clash @ 8 oz + Weedone @ 8.5 oz provide about 75% control at 42 DAA-C, which was the best rating of the three application C treatments.

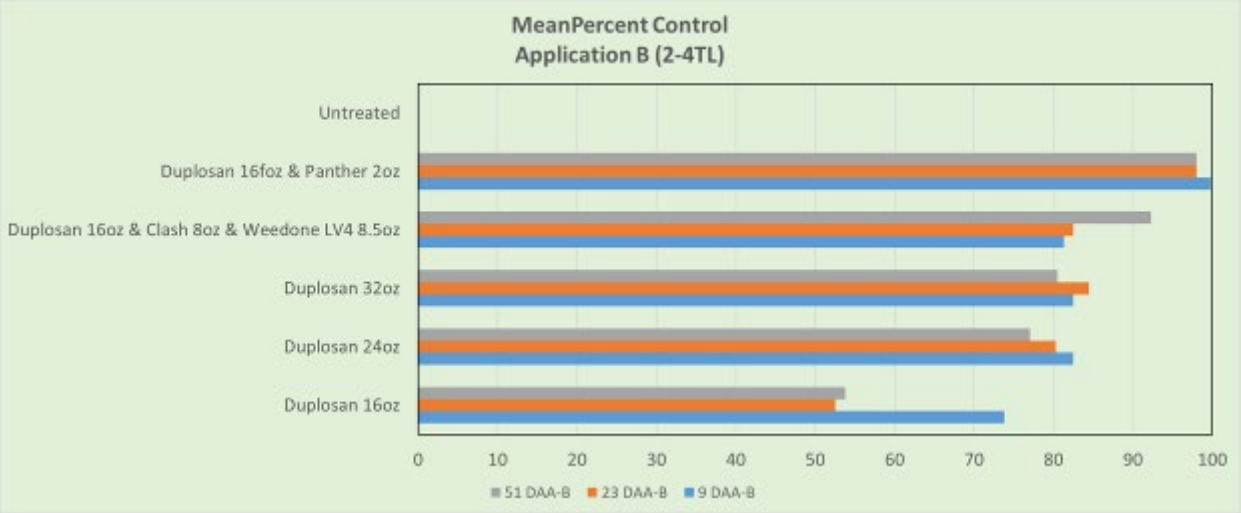

Figure 4. Mean percent control for application timing B. College Station, TX. 2019.

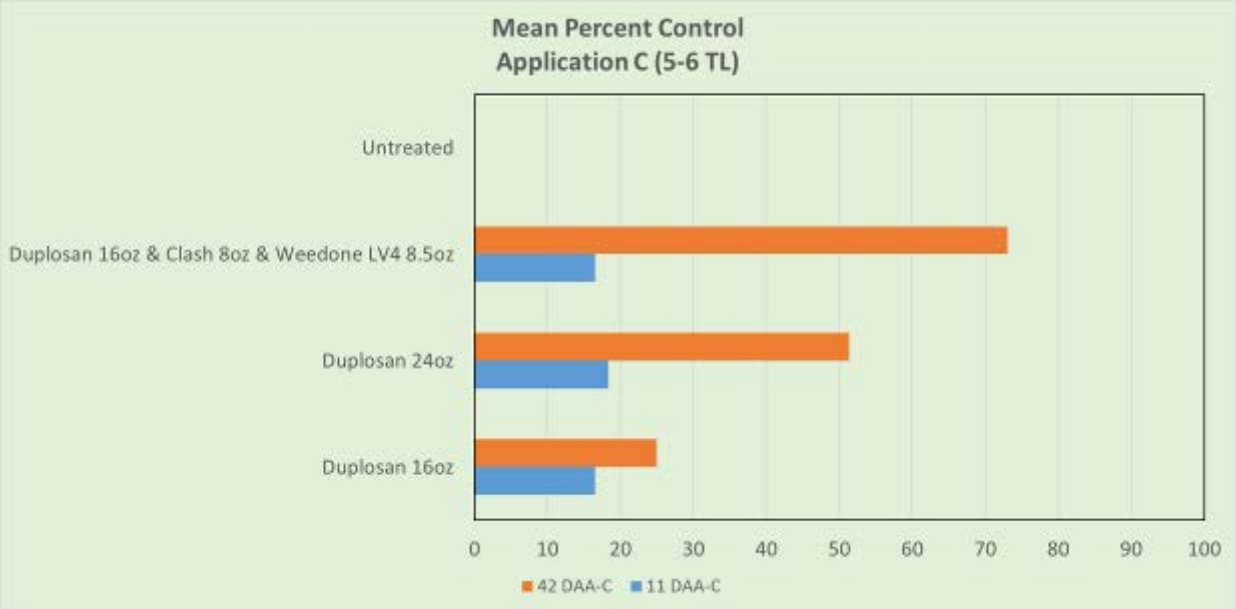

Figure 5. Mean percent final control. College Station, TX. 2019.

From a final control rating, the treatments applied at the Cotyledon to 2TL stage provided better generally better control than the same treatments applied at the 2TL-4TL stage (Figure 6). control than the Duplosan @ 16 oz + Panther @ 2oz. The Duplosan + Panther @ cotyledon stage was the only treatment that provided 100 percent regrowth control at the final rating stage of July 31.

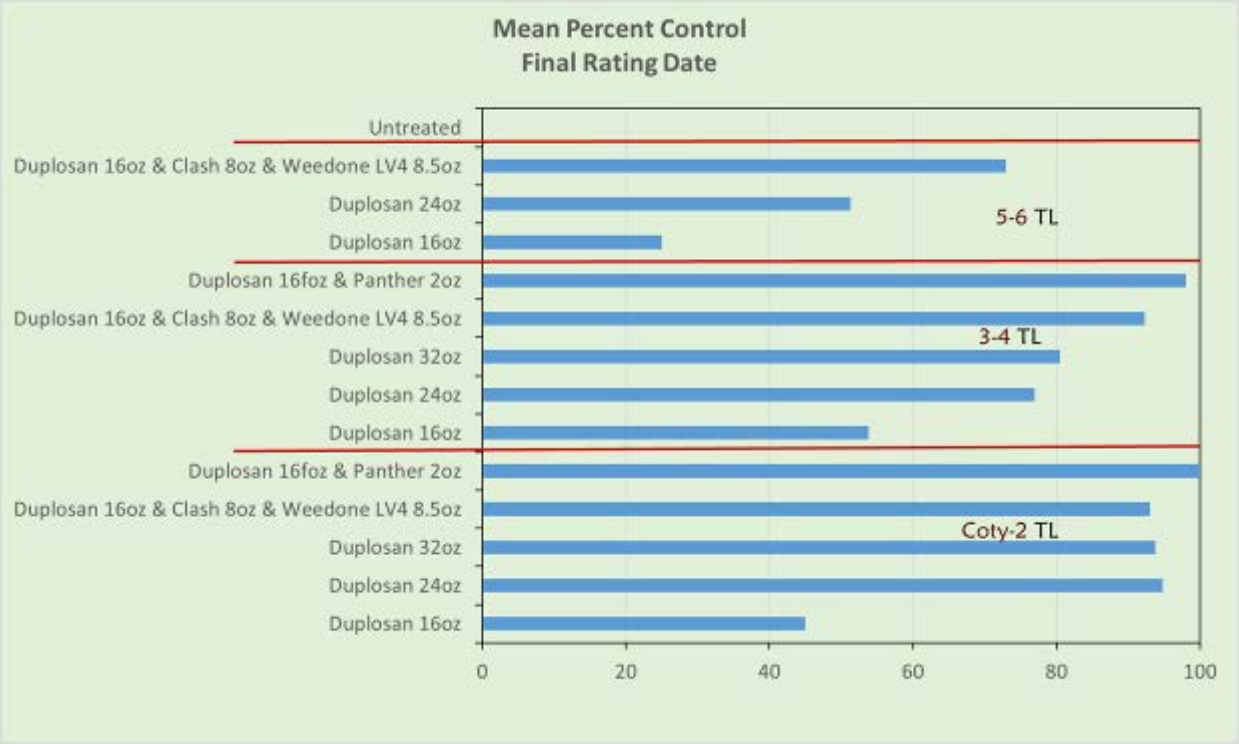

Figure 6. Mean percent final regrowth. College Station, TX. 2019.

Summary

In general, Duplosan alone provided acceptable control of volunteer cotton at the 24 and 32 oz/ac rate at the Cotyledon-2 TL application timing. It didn't provide effective control at the 2-4TL or later growth stage treatment timings. The tank-mix applications of Duplosan with Clash and Weedone and Duplosan with Panther provided acceptable control up through the 2-4 TL application timings, with the tank-mix with Panther providing the best and most consistent control.

The performance of Duplosan alone or tank-mixed with various products did provide good control volunteer cotton with a single application, as long as it was applied to cotton prior to it reaching the 5 TL stage. Better efficacy is expected when application coverage is thorough, so by reducing application speed and increasing volume and choosing appropriate nozzles will be key to ensure thorough coverage to avoid any plants being missed. Furthermore, the use of a crop oil concentrate is also highly suggested to achieve best overall performance.

Acknowledgements

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