



ENLIST™ TECHNOLOGY FOR WEED CONTROL IN CORN

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SUMMARY

Dow AgroSciences is developing the Enlist™ Weed Control System to address critical weed control challenges. This system will provide an innovative new family of traits providing tolerance to multiple herbicide classes of chemistry in corn. An herbicide component of this system will be new 2, 4-D choline alone and 2, 4-D choline + glyphosate formulations. Replicated trials were established at multiple locations to evaluate efficacy of these new formulations against important crop weeds. There was a significant improvement over glyphosate alone in control of several weeds including *Erigeron bonariensis*, *Ipomoea grandifolia*, and *Commelina benghalensis*.

INTRODUCTION

Corn is widely planted across Brazil with planted area projected to continue slowly increasing beyond the current estimate of 15 million hectares (Conab, 2012). Glyphosate is widely used to control weeds in burndown and increasingly in-crop as a large proportion of growers are planting glyphosate tolerant hybrids. Resistance to glyphosate in a number of very competitive weed species has been identified (Gazziero, 2008; Vargas et al., 2007). The Enlist™ Weed Control System will provide corn growers with new weed control options including the ability to apply 2, 4-D choline before planting and in-crop to Enlist™ corn that are genetically modified to tolerate 2,4-D treatment. Extensive field testing of this technology has been initiated.

The objective of this paper is to present results from several trials conducted to determine response to 2,4-D choline of several important weed species known to be hard to control with glyphosate in corn.

MATERIAL AND METHODS

Weeds targeted in the trials were *Ipomoea grandifolia* and *Spermacoce latifolia*. The field trials were conducted during the October to January 2010-11 growing period in the states of Minas Gerais, Sao Paulo, and Parana in Brazil. Most applications were made in fallow settings (no crop present). Treatments included 2,4-D choline, 2,4-D choline + glyphosate premix, glyphosate, and no treatment. Treatments were replicated four times in a randomized block design with plots either two by five meters or three by five meters in size. Applications were made using a backpack CO₂ applicator delivering 150 L/ha of spray volume. Weed sizes at application varied by species but generally ranged from 2 to 6 leaves. Visual weed control ratings were made at 7, 14, and 28 days after application. Data were analyzed using one-way analysis of variance and means separated using LSD test with P= 0.05.

RESULTS AND DISCUSSION

Complete control of *I. grandifolia* was observed across all locations for the premix of 2, 4-D choline and glyphosate at both test rates (Fig. 1). Glyphosate averaged good control, but performance was variable across plots. *I. grandifolia* control with 2, 4-D choline alone (Fig. 2) averaged between 90 and 95% for the two rates tested and was superior to glyphosate applied alone, but with more variability than observed for the pre-mix of 2- 4,D choline and glyphosate in Fig. 1.

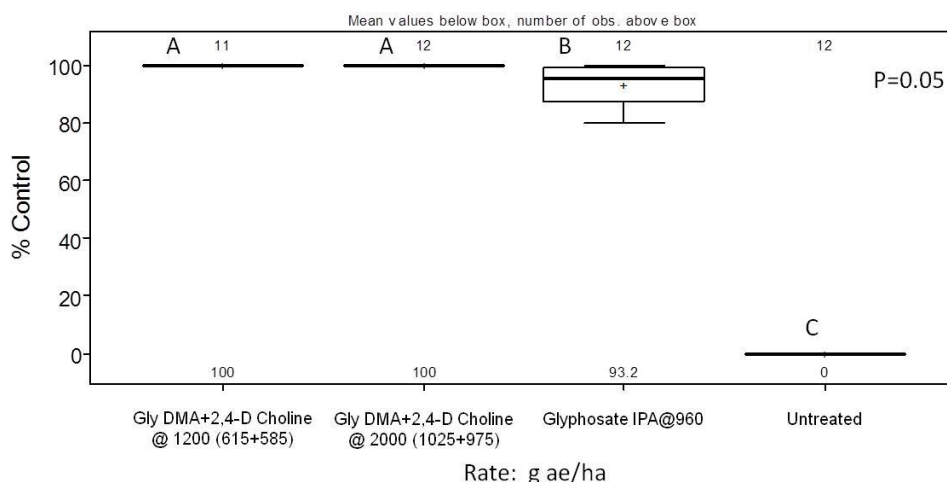


Figure 1. *I. grandifolia* control 28 days after application, summary across three trials (two in San Paulo and one in Minas Gerais). Mean values are below box and number of observations above box. Boxes with the same letter indicate the means are not statically different, P=0.05.

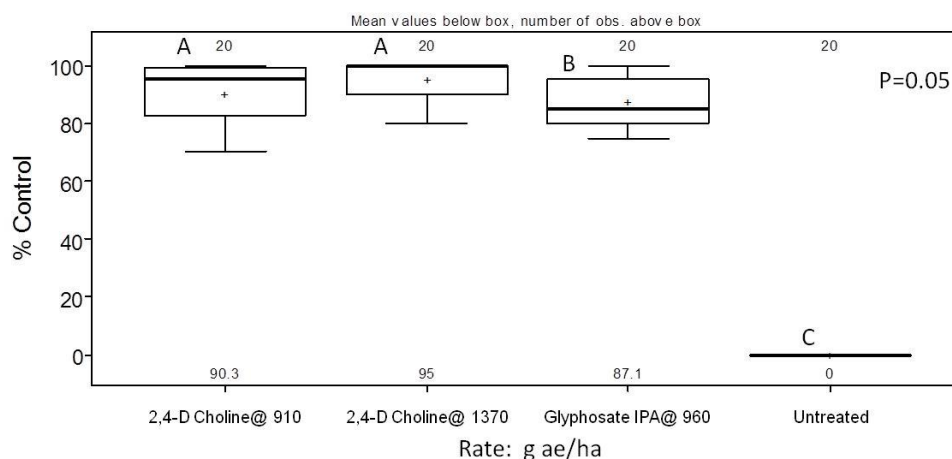


Figure 2. *I. grandifolia* control 28 days after application, summary across five trials (one in San Paulo, two in Minas Gerais and two in Parana). Mean values are below box and number of observations above box. Boxes with the same letter indicate the means are not statistically different, P=0.05.

S. latifolia control was less than 80% with glyphosate at 960 g ae/ha while the premix of 2, 4-D choline and glyphosate averaged 92 and 98% control, respectively, for this difficult-to- control species. The first treatment of glyphosate plus 2, 4-D has 40% less glyphosate than the glyphosate treatment alone, thus showing the impact of 2,4-D choline in controlling this species.

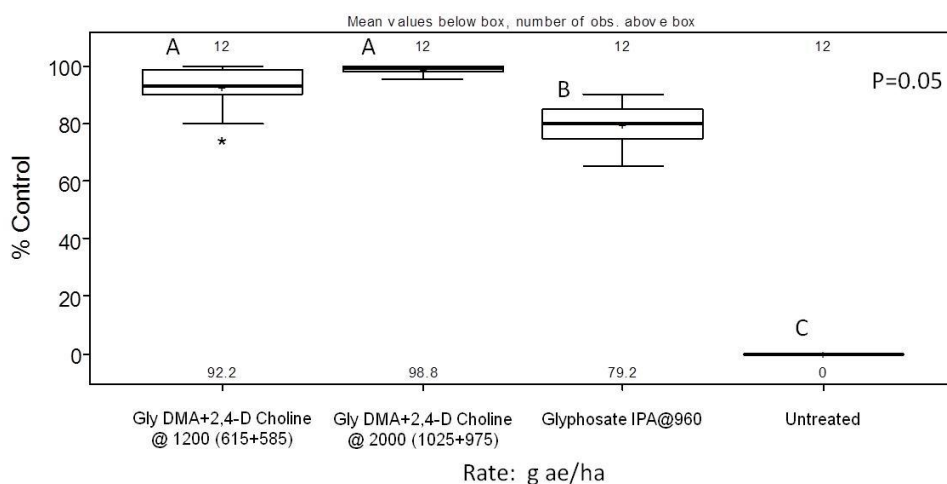


Figure 3. *S. latifolia* control 28 days after application, summary across three trials (three in San Paulo). Mean values are below box and number of observations above box. Boxes with the same letter are not statically different, P=0.05.

CONCLUSIONS

Corn growers face a number of difficult-to-control weed species in Brazil. The results reported clearly show the weed control advantages obtained when including 2,4-D choline in a glyphosate-based corn weed management program. The Enlist™ Weed Control System that includes 2, 4-D choline formulations and Enlist™ corn will greatly complement the current glyphosate-tolerant cropping system used by growers with increased application timing flexibility and broaden weed control spectrum.

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