

Comparison of 2,4-D + Edict, Milestone, Overdrive, and Transline for Canada Thistle (*Cirsium arvense* L.) Control

Introduction

Canada thistle is a problematic invasive weed species along Kentucky highways. Mowing infestations can increase densities as this perennial species can reproduce via seed as well as rhizomatous sprouts. Chemical control options in the past have included picloram, clopyralid, and dicamba with results being average to moderately good at best. Introduction of Milestone VM (a.i. aminopyralid) in 2006 provided another control option for this particular species. Edict (a.i. pyraflufen) has been introduced in the non-crop market from the cereal market as a possible tank mix partner to increase efficacy of compounds such as 2,4-D. A study was conducted in 2006 to compare industry standards to the new introductions for Canada thistle control.

Methods and Materials

The study was located at the UK Spindletop Research Farm in Lexington, KY. Six (6) chemical treatments and one (1) untreated check were evaluated in a randomized complete block design with four (4) replications (Table 1). Evaluation of the trial 1 YAT showed that the 4th replication had been lost and therefore only the first 3 were used in analysis. Treatments included 2,4-D + Edict, Milestone VM, Overdrive (a.i. dicamba + diflufenzopyr), and Transline (a.i. clopyralid). The study was installed on May 15, 2006 in a tall fescue stand with an even distribution of Canada thistle. Canada thistle plants were either pre or post bolt with no visible flower parts on any plant. Application volume was 25 GPA and all treatments included Activator 90 surfactant at 0.25 % v/v. Visual percent control ratings were taken at 21, 44, 81, and 114 DAT. Canada thistle counts were taken 364 DAT using a 1 m² sampling square and 3 random samples per plot. Average Canada thistle counts per plot were then compared to the average untreated plot in the same replication and transformed into percent control with the following formula:

$$\text{Percent control} = (1 - (\text{treated response} / \text{untreated response})) * 100.$$

Data were analyzed using ARM software and treatment means were compared using Fisher's LSD at $p = 0.05$.

Results and Discussion

Milestone VM provided higher levels of control at all evaluation dates than all other treatments (Table 1). Milestone VM at 7 fl oz / ac resulted in 75 % control at 21 DAT, increased to ~ 95 % control at 44 and 81 DAT, then decreased to 86 % control 114 DAT. Milestone VM resulted in 93 % control as compared to the untreated 364 DAT. Transline at 10.67 fl oz / ac (2/3 pt / ac) provided the second highest level of control at any given evaluation throughout the study with its highest level of control coming at 81 DAT. Transline maintained satisfactory control levels through 364 DAT.

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Overdrive at 6 oz / ac provided marginal control with its highest level of suppression being 60 % at 81 DAT. Past research has shown Overdrive to be effective at controlling Canada thistle at this rate and at 4 oz / ac when tank mixed with Transline¹.

The addition of Edict at 1.4 fl oz / ac did not appear to increase efficacy of 2,4-D amine at either rate tested for Canada thistle control. 2,4-D alone at 1.5 qt / ac provided similar control levels to that of 2,4-D at 1.5 qt .ac + Edict at 1.4 fl oz / ac.

Table 1: Summary Statistics for 2006 Canada Thistle Trial

| Treatment | Rate per acre | Percent Control | | | | |
|---------------------|--------------------|-----------------|--------|--------|---------|---------|
| | | 21 DAT | 44 DAT | 81 DAT | 114 DAT | 364 DAT |
| 2,4 D amine + Edict | 1 qt + 1.4 fl oz | 42 cd | 38 c | 17 e | 33 bc | 35 b |
| 2,4-D amine + Edict | 1.5 qt + 1.4 fl oz | 53 bc | 67 b | 33 de | 25 c | 43 b |
| 2,4-D amine | 1.5 qt | 53 bc | 55 bc | 50 cd | 33 bc | 73 ab |
| Milestone VM | 7 fl oz | 77 a | 97 a | 95 a | 85 a | 93 a |
| Overdrive | 6 oz | 40 d | 47 bc | 63 bc | 45 bc | 38 b |
| Transline | 10.67 fl oz | 57 b | 69 b | 85 ab | 58 ab | 75 ab |
| Untreated Check | | 0 | 0 | 0 | 0 | 0 |

Note: Treatment means followed by the same letter in the same column are not significantly different using Fisher's LSD at $p = 0.05$. All treatments included a non-ionic surfactant at 0.25% v/v.

¹ Blair, M.P. and Witt, W.W. 2004. *Noncrop and Industrial Weed Science Annual Research Report*.