Aminocyclopyrachlor (KJM44) Combinations for Selective Weed Control in Cool Season Grasses

Introduction

Aminocyclopyrachlor (KJM44) is a synthetic auxin active ingredient currently in development for the non crop and invasive vegetation management market by DuPont. KJM44 has shown potential, both alone and in tank mixes, to provide a selective weed control option for problematic plant species common to the roadside environment. Problematic species include musk thistle, common teasel, poison hemlock, and others. A trial was installed in the summer of 2008 to examine the potential of KJM44 in controlling some of the problematic species that occur along Kentucky's roadsides. Specifically, KJM44 was evaluated for musk thistle, common teasel, and overall herbaceous weed control.

Methods and Materials

Fourteen treatments were installed in a randomized complete block design with 4 replications at the intersection of the Gene Snyder Expressway (I- 265) and Billtown Road (exit 19) in Jefferson County, KY. Plots, measuring 10' X 30', were treated at 20 GPA using a CO_2 powered sprayer mounted on an ATV on July 1, 2008. Treatments included KJM44 alone, KJM44 plus Telar, KJM44 plus Escort, and Milestone VM plus Plateau as the standard and all treatments included a methylated seed oil at 1% v/v. A severe drought, which started in 2007, continued into the growing season of 2008.
Data were collected 16, 31, and 44 DAT and included visual percent control by species. Data were analyzed using ARM® software and treatment means were separated using Fisher's LSD at $p = 0.05$.

Results

Musk Thistle Control
KJM44 plus Escort plus Roundup Pro, KJM44 plus Telar plus Roundup Pro, KJM44 at 1.25 oz / ac plus Telar at 0.5 oz / ac, and KJM44 at 1.25 oz / ac plus Escort at 0.5 oz / ac resulted in statistically significant more control of musk thistle 16 DAT than the Milestone plus Plateau treatment (Table 1). This difference was short-lived, however, as all chemical treatments resulted in excellent control of musk thistle (99%) 44 DAT.

Common Teasel Control
Control levels for common teasel 16 DAT ranged from 40 % (KJM44 at 1.87 oz / ac plus Telar at 0.75 oz / ac) to 20 % (KJM44 at 1.25 oz / ac plus Telar at 0.5 oz / ac and KJM44 at 1.25 oz / ac) (Table 1). Although not as consistent as musk thistle control, all treatments resulted in control levels greater or equal to 85 % 44 DAT.

Overall Broadleaf Weed Control
All treatments resulted in greater than 90% broadleaf weed control 44 DAT (Table 1). There were no statistical differences in control levels for any treatment 31 or 44DAT.

Drought Effects

The trial was terminated 44 DAT due to the effects of the 2007-2008 drought. Cool season grass species were under extreme stress 44 DAT and were not evaluated for damage. Broadleaf weeds were also under extreme stress during the trial and undoubtedly influenced control levels, especially for common teasel.

Summary

KJM44 appears to be effective in controlling two common problematic weeds, musk thistle and common teasel. The two treatments that included Roundup Pro were extremely damaging to cool season grasses, even at the low 16 fl oz / ac rate tested. The trial will be re-installed in 2009 in an attempt to truly determine rate titrations for effective weed control and cool season grass response to KJM44 applications.

Table 1: Results of 2008 KJM44 Selective Weed Control Trial

Treatment	Rate per acre	Musk Thistle Control			Common Teasel Control			Broadleaf Weed Control		
		16 DAT	31 DAT	44 DAT	16 DAT	31 DAT	44 DAT	16 DAT	31 DAT	44 DAT
KJM44	0.625 oz	57 abc	97 ab	99 a	35 ab	85 ab	97 ab	43 abc	85 a	97 a
KJM44	1.25 oz	48 bc	99 a	99 a	20 c	55 c	90 abc	34 bc	85 a	96 a
KJM44	1.87 oz	65 abc	99 a	99 a	28 bc	75 ab	93 abc	40 abc	90 a	96 a
KJM44	2.5 oz	73 abc	99 a	99 a	23 c	68 bc	85 c	46 abc	86 a	94 a
KJM44 + Telar	0.625 oz + 0.25 oz	47 bc	93 b	99 a	25 bc	88 a	95 abc	34 bc	88 a	95 a
KJM 44 + Telar	1.25 oz + 0.5 oz	83 ab	98 a	99 a	20 c	55 c	88 abc	43 abc	87 a	95 a
KJM44 + Escort	1.25 oz + 0.5 oz	90 a	99 a	99 a	23 c	87 ab	95 abc	55 ab	94 a	96 a
KJM44 + Escort	1.88 oz + 0.75 oz	68 abc	98 a	99 a	25 bc	83 ab	92 abc	50 abc	92 a	97 a
Milestone VM + Plateau	4 fl oz + 2.84 fl oz	38 c	98 a	99 a	25 bc	93 a	99 a	30 c	91 a	98 a
KJM44 + Telar	1.87 oz + 0.75 oz	64 abc	99 a	99 a	40 a	90 a	99 a	58 a	97 a	99 a
KJM44 + Telar	2.5 oz + 1 oz	65 abc	99 a	99 a	27 bc	85 ab	93 abc	48 abc	91 a	97 a
KJM44 + Escort + Roundup Pro	2.5 oz + 0.75 oz + 16 fl oz	90 a	99 a	99 a	28 bc	93 a	99 a	58 a	96 a	99 a
KJM44 + Telar + Roundup Pro	2.5 oz + 1 oz + 16 fl oz	93 a	99 a	99 a	25 bc	80 ab	97 bc	63 a	94 a	94 a
Untreated		0	0	0	0	0	0	0	0	0

Note: Treatment means in the same column followed by the same letter are not statistically different using Fisher's LSD at p = 0.05. All treatments included MSO at 1 % v/v.