

# Spotted Knapweed Control with Herbicides Containing Aminocyclopyrachlor, 2013

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## Abstract

Spotted knapweed (*Centaurea maculosa*) is an invasive weed species that spreads rapidly and aggressively invading pasture, rangeland and fallow land. Aminocyclopyrachlor is a growth regulator herbicide developed by DuPont Crop Protection<sup>®</sup> that has shown to be effective at controlling a broad range of annual and perennial broadleaf weeds. A field study was initiated in spring of 2012 near Madras, Oregon to evaluate the efficacy of using aminocyclopyrachlor when combined with a sulfonylurea (Perspective<sup>®</sup>) or other growth regulator at different rates to control spotted knapweed. Evaluations performed in spring of 2013, a year after the application showed excellent spotted knapweed control with Perspective<sup>®</sup> at 4.5 oz/acre, aminopyralid + 2, 4-D at 4 or 8 fl oz/acre similar to Milestone applied at 7 fl oz/acre.

## Introduction

Spotted knapweed is a biennial or short-lived perennial member of the sunflower family. This invasive weed species spreads rapidly and aggressively invading pasture, rangeland and fallow land. Spotted knapweed is a prolific seed producer and the seeds can remain viable in the soil for more than five years, becoming the seed source for re-infestations after vegetative plants have been eliminated. Plant roots also exudates allelopathic compounds that affect the growth of desirable vegetation. Aminocyclopyrachlor is growth regulator herbicide developed by DuPont Crop Protection<sup>®</sup> that has shown to be effective controlling a broad range of annual and perennial broadleaf weeds. The objective of this study was to evaluate spotted knapweed control efficacy of aminocyclopyrachlor when combined with a sulfonylurea or other growth regulator.

## Materials and Methods

A field study was initiated 6 miles northwest of Madras, Oregon during 2012, in non-crop land infested with spotted knapweed. The study design was a randomized complete block with 4 replications. Plot size was 10 ft wide by 30 ft long. Herbicides were applied when spotted knapweed was at the rosette stage, with a backpack sprayer calibrated to deliver 20 gallons of spray solution per acre at 40 psi pressure using XR 8002 Teejet<sup>®</sup> nozzles. Application date, environmental conditions and weed growth stage are detailed in Table 1. Herbicides included in the study included aminocyclopyrachlor + chlorsulfuron (Perspective<sup>®</sup>), aminocyclopyrachlor + 2, 4-D ester and aminopyralid (Milestone<sup>®</sup>) as the comparison standard. Herbicide rates and spray adjuvants are detailed in Table 2. Herbicide efficacy was evaluated 60, 90 and 365 DAT.

## Results and Discussion

The 60 and 90 DAT evaluations indicated similar levels of spotted knapweed control among the tested treatments with the exception of Perspective<sup>®</sup> applied at 2.5 oz/acre. Control with this treatment was the lowest and ranged between 80 and 83 percent (Table 2). A year after the application, a high level of spotted knapweed control persisted with aminopyralid + 2, 4-D at 4

or 8 fl oz/acre and Milestone at 7 fl oz/acre. Control with Perspective<sup>®</sup> at 2.5 oz/acre 365 DAT was 72 percent, but control significantly improved when the application rate was increased to 4.5 oz/acre. These results suggest that aminocyclopyrachlor when combined with a sulfonyleurea at the highest tested rate or 2, 4-D can effectively control spotted knapweed in central Oregon.

### Acknowledgments

The authors would like to thank Norm McKinley from DuPont Crop Protection<sup>®</sup> for supporting this project and Mr. Floyd Paye for his collaboration on the project.

**Table 1.** Application dates, environmental conditions, and spotted knapweed growth stage at time of application.

Application Date	5/8/2012
Time of Day	11:00 am
Air Temperature (F)	66
Relative Humidity (%)	48
Wind Speed (MPH)	3
Wind Direction	NNW
Growth Stage	Rosette

**Table 2.** Spotted knapweed percent control compared to the untreated check, 60, 90 and 365 days after treatment.

Treatment <sup>123</sup>		Rate	60 DAT	90 DAT	365 DAT
1	Perspective® NIS	2.5 0.25	oz/acre % v/v	80 b 83 b	72 b
2	Perspective® NIS	4.5 0.25	oz/acre % v/v	94 a 97 a	91 a
3	Aminocyclopyrachlor 2,4-D Ester NIS	4 1 0.25	fl oz/acre pt/acre % v/v	98 a 97 a	95 a
4	Aminocyclopyrachlor 2,4-D Ester NIS	8 2 0.25	fl oz/acre pt/acre % v/v	99 a 98 a	98 a
5	Milestone® NIS	7 0.25	fl oz/acre % v/v	98 a 98 a	97 a
6	Untreated Check		0 c	0 b	0 b
LSD (P=.05)			5	8	13

<sup>1</sup>Some treatments included in the study were used for experimental purposes and are NOT currently labeled for public use. Before using an herbicide, make sure is properly labeled for the intended use.

<sup>2</sup>Abbreviations: DAT, Days After Treatment; NIS, Non Ionic Surfactant.

<sup>3</sup>Means followed by the same letter are not significantly different.