Response of smooth hawkweed to several herbicides. Timothy W. Miller and Laurel Baldwin. (Washington State University, Mount Vernon, WA 98273 and Whatcom County Noxious Weed Control, Bellingham, WA 98226) Smooth hawkweed is a recently-introduced European weed that is currently known to infest portions of Whatcom, Skagit, and Snohomish counties in northwestern Washington. In 1998, this hawkweed species was listed as a Class B noxious weed in Washington. Due to the newness of the weed in the state, it was desirable to test several herbicides with potential to aid in the control of smooth hawkweed on roadsides, non-cropland sites, and pastures.

The experiment was established April 6, 1999 on a roadside near Bellingham, Washington heavily infested with smooth hawkweed. Treatments were applied May 10, when the hawkweed was 4 to 8 inches tall and actively growing. Rain had fallen most of the previous week, but the weeds were dry at the time of application (Table 1). Herbicides were applied using a CO_2-pressurized backpack sprayer spraying the equivalent of 31.3 gpa at 37 psi. Smooth hawkweed control was visually estimated June 7 (28 days after treatment, DAT). A 0.09 m^2 quadrat was placed within each plot June 18, and vegetation within the quadrat clipped at the soil line. Grasses were then separated from hawkweed, and both components were air-dried inside a greenhouse for 7 days and dry weights recorded. The experimental design was a randomized complete block with four replicates. Means were separated using Fisher's Protected LSD. Data are presented in Table 2.

Table 1. Application data.

10:00 a.m., May 10, 1999
Broadcast, postemergence
Weeds 4 to 8 in. tall
40% cloud cover
Winds 2 to 4 mph from W
Air temp. = 55 F
Soil temp (6") = 41 F
Relative humidity = 48%
No dew; soil surface moist

Initial control of smooth hawkweed ranged from 34 to 89% at 28 DAT. Treatments with clopyralid, dicamba, triclopyr, BAS 662, and 2,4-D generally provided fair control of the weed (80% control or greater). All herbicide treatments except metsulfuron applied alone reduced hawkweed dry weight at 39 DAT compared to the untreated control. Hawkweed biomass weights ranged from 1.2 to 5.9 g/0.09 m^2 (119 to 585 lbs/ac). Grass dry weight at 39 DAT was not statistically affected by these herbicides and ranged from 2.4 to 7.1 g/0.09 m^2 (238 to 703 lbs/ac). Hawkweed flowering in 1999 was suppressed by all treatments except 2,4-D amine (data not shown). Hawkweed density will be rated in the spring of 2000 to more fully evaluate the effect of the 1999 herbicide application.

Table 2. Control of smooth hawkweed at 28 days after treatment (DAT) by various herbicides, and dry weight of hawkweed and grass at 39 DAT.

Treatment	Rate	Weed Control	Dry weight	
			Hawkweed	Grass
	lbs/A	---%---	g/0.09 m^2	g/0.09 m^2
BAS 662 01 H	0.5 + 0.19	81	1.2	5.3
2,4-D amine	3.0	55	5.7	5.5
dicamba	1.0	68	5.9	6.4
dicamba + 2,4-D	0.5 + 1.4	80	4.0	7.1
clopyralid + 2,4-D	0.19 + 1.0	89	3.8	5.3
triclopyr + 2,4-D	0.75 + 1.5	80	2.6	4.7
clopyralid	0.38	84	3.5	4.5
metsulfuron[a]	0.6 oz	34	12.6	2.7
metsulfuron[a] +	0.6 oz +	74	3.1	2.5
dicamba + 2,4-D	0.5 + 0.95	---	---	---
Untreated control	---	0	12.9	4.7
$LSD_{0.05}$	---	15	5.2	ns

[a]Metsulfuron treaments applied with silicon surfactant (Sylgard) at 0.2 %, v/v.