

Alfalfa Weed Control Research Update

Alfalfa and Forage Meeting
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The screenshot shows the website for the University of California Cooperative Extension Fresno County. The header includes the UC logo and the text "University of California Cooperative Extension Fresno County". Below the header is a navigation bar with "UCCE Fresno" and "Contact Us". A sidebar on the left contains a menu with items: Home, Powerpoint Presentations, Website Links, Weed Identification, Weed and Herbicide Topics, Weed Herbicide Charts, and Research Reports. The main content area is titled "Weed Management" and includes a sub-section "About my Program". This section contains text describing the impact of weeds on crop production and land values, and a photograph of a field with tall weeds. A portrait of Kurt Hembree is shown on the left side of the main content area, with his name and title "Weed Management Farm Advisor" below it. In the top right corner of the main content area, there are links for "EMAIL" and "PRINT".

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Weed Management

About my Program

Crop and non-crop areas alike are impacted by weed growth to one degree or another. Weeds affect crop production in several ways; weeds delay or reduce stand establishment, affect crop growth and development, reduce food quality and yield, compete for resources like water and soil nutrients, reduce irrigation uniformity and efficiency, harbor rodents and other destructive pests, increase the risk of frost hazard in temperature sensitive crops, and increase the cost of production. In non-crop settings, weeds may be poisonous to people and livestock, interfere with water recreation and water transport, cause potential traffic hazards, pose a fire hazard, are unsightly, and reduce land values.

To effectively manage weeds, one must be able to correctly identify the weeds present, develop a broad understanding of weed growth and survival, become familiar with the tools (both chemical and non-chemical) available, and implement a strategy that is both economically and environmentally sound. This is sometimes referred to as "Integrated Weed Management".



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Weeds and their common impacts:

Cheeseweed

Dodder

Fiddleneck

Groundsel

Hairy fleabane

Henbit

Horseweed

Junglerice

Knotweed

Nettle

Sowthistle

Sprangletop

Swinecress

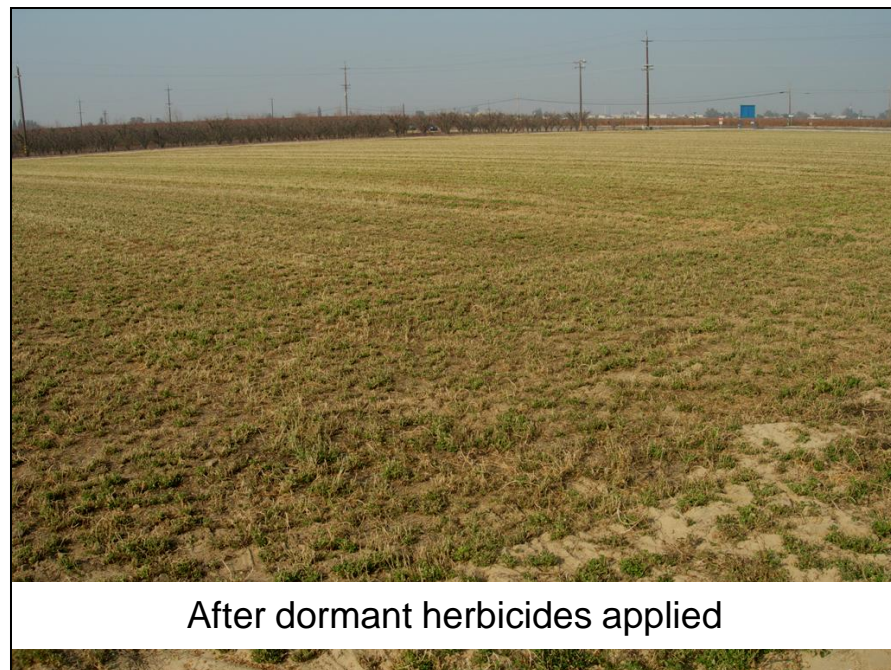
Nutsedge

Yellow foxtail

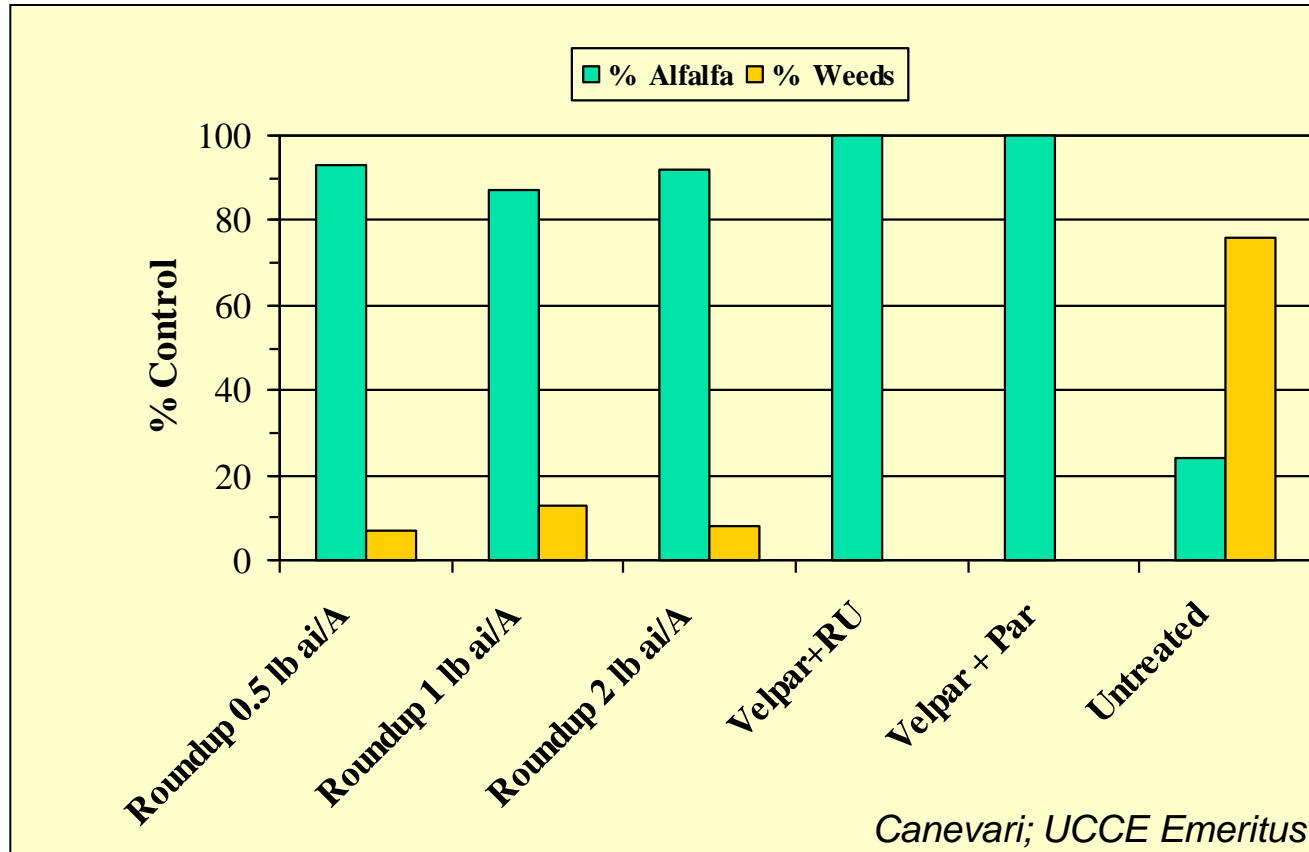


- ▶ Stand development
- ▶ Yield
- ▶ TDN
- ▶ Palatability
- ▶ Poisonous
- ▶ Off-flavoring

Herbicides are commonly applied during the dormant period:



Previous work in dormant alfalfa:



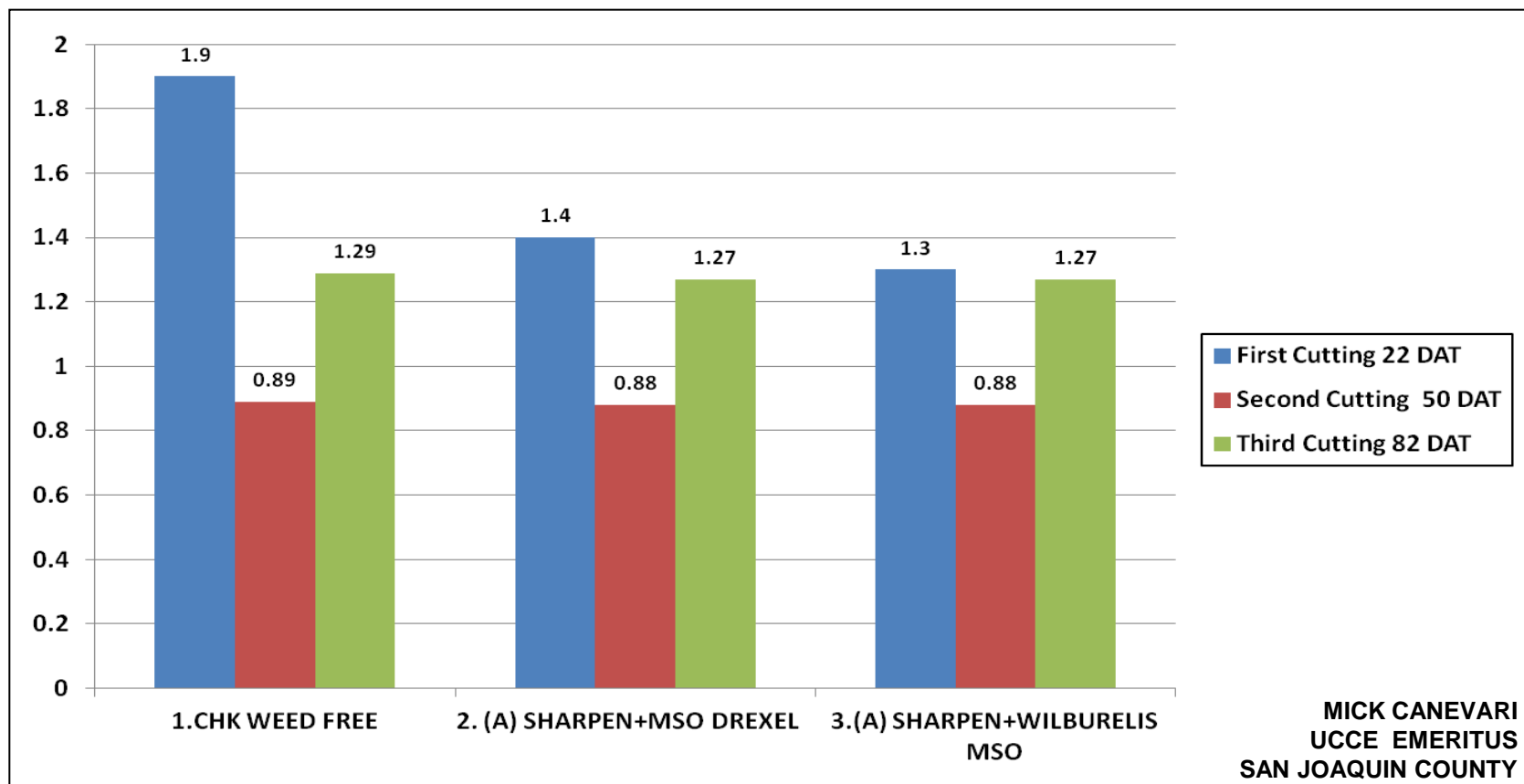
Weeds: annual sowthistle, chickweed, burning nettle, malva, annual bluegrass.

We began conducting field trials in 2013 to evaluate the effect of dormant treatments of saflufenacil (Sharpen) on weed control, alfalfa injury, alfalfa re-growth, and yield.

****Note: Sharpen was not registered in alfalfa in California at the time of these trials.***

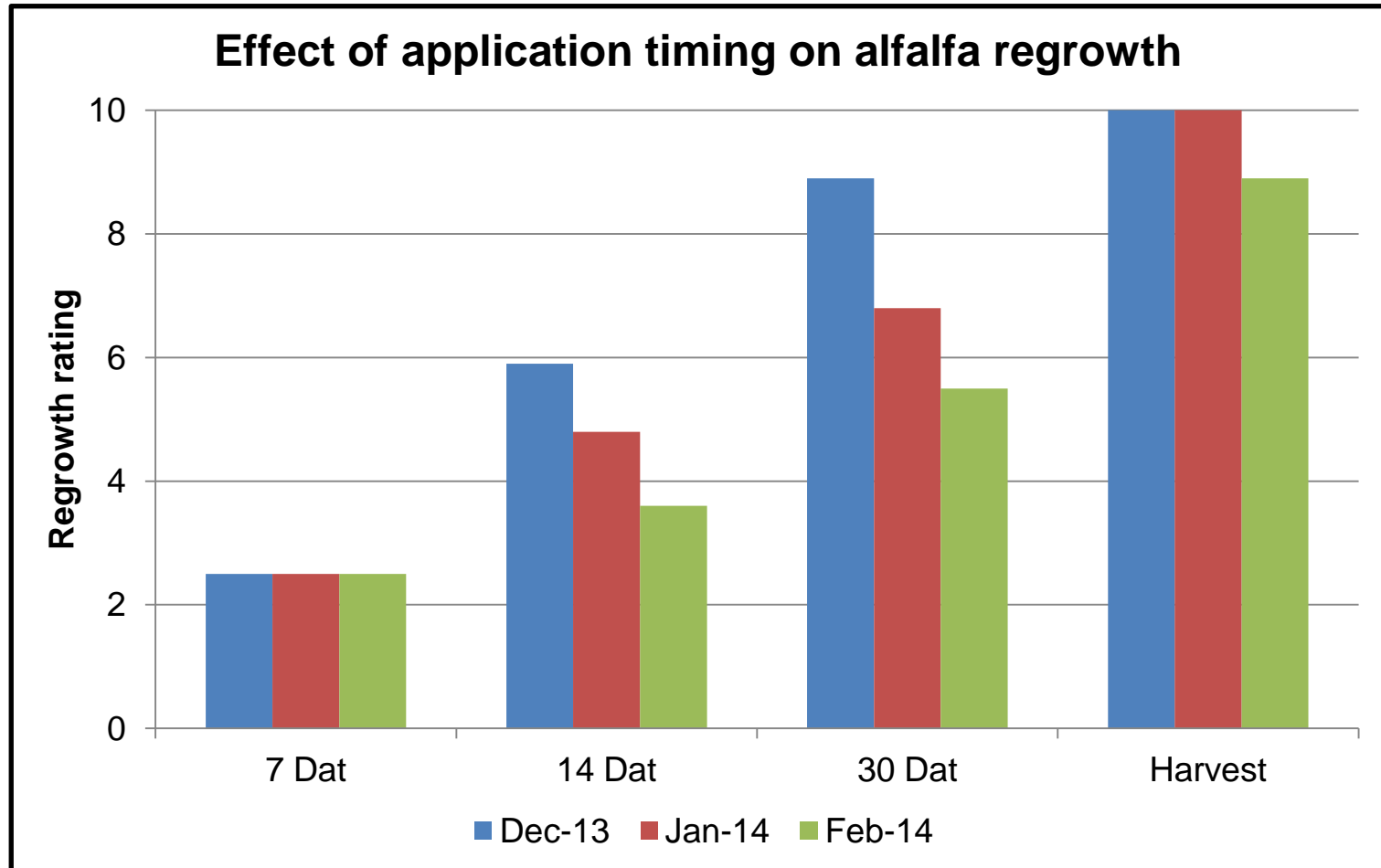
Alfalfa Tolerance to Sharpen Between Cuttings - 2013

TONS/ACRE

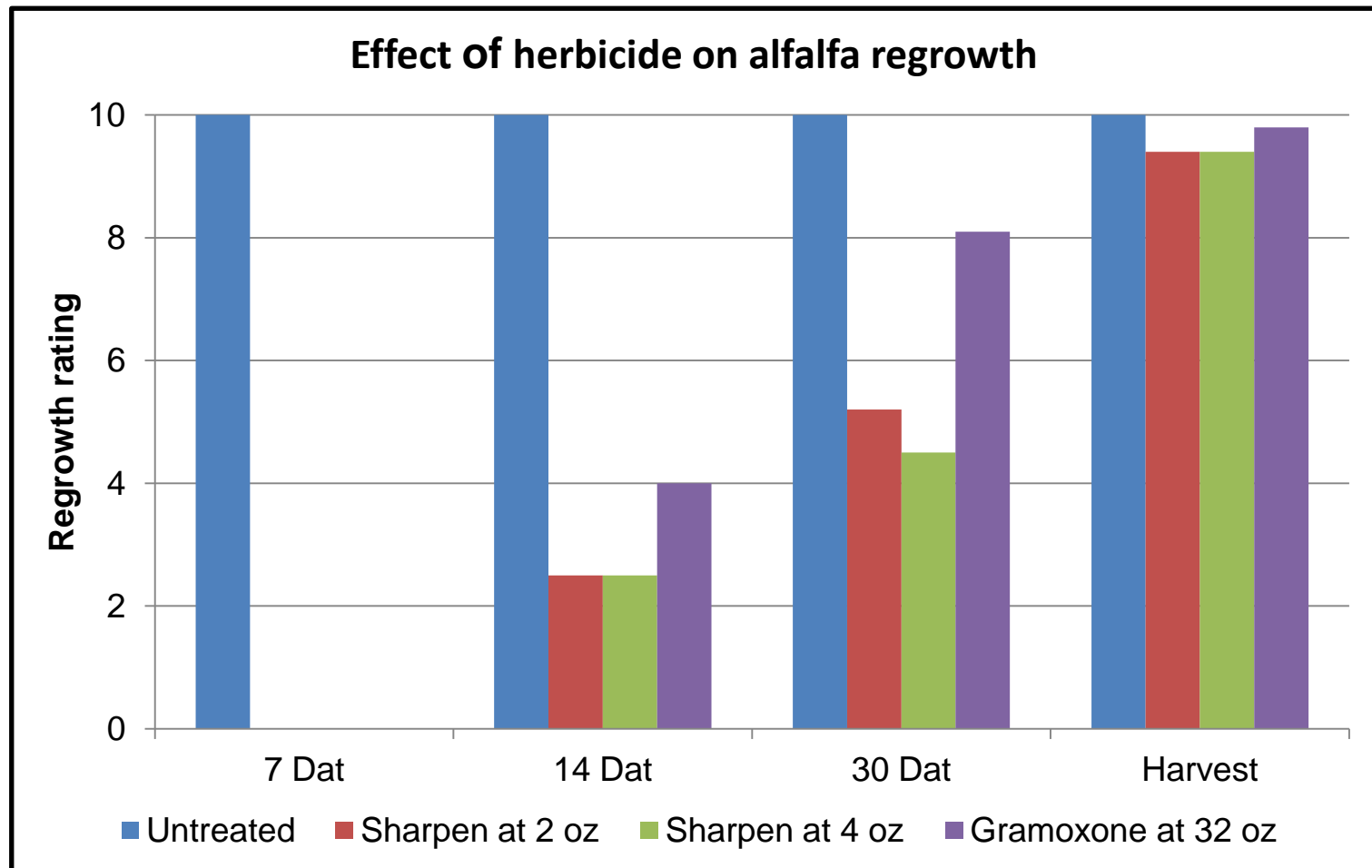


Appl. A = 5/28/13; Sharpen @ 0.0445 lba/A.; All additives @ 1.0% V/V; All treatments AmmoSulfate @ 8.5lb/100gal

Results in 2014 (KAC):



Results in 2014 (KAC):



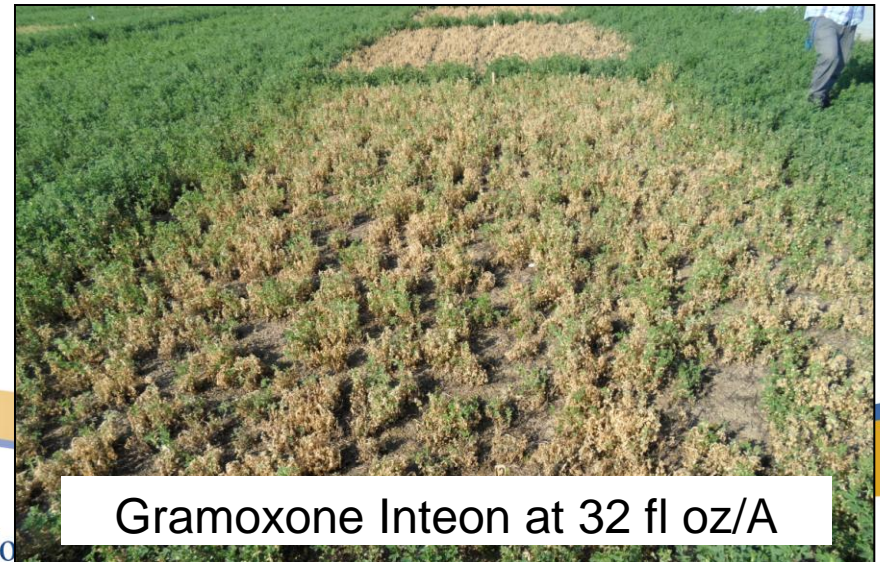
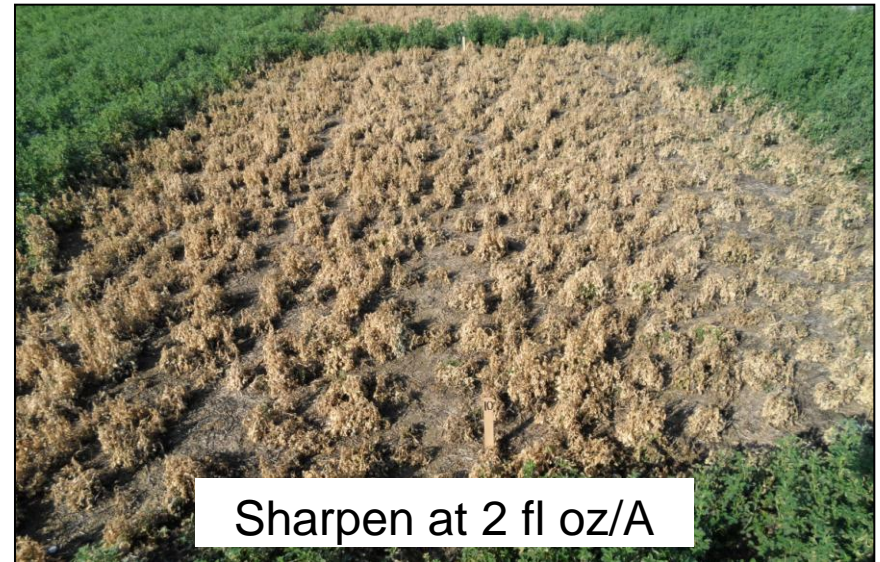
Alfalfa recovery in 2014 (KAC)

(2 weeks after Feb application of Sharpen):



Alfalfa recovery in 2014 (KAC)

(2 weeks after Feb application):



Alfalfa recovery in 2014 (KAC)

(2 weeks before 1st cutting):



Treated Dec 2013



Treated Jan 2014



Treated Feb 2014

Alfalfa recovery in 2014 (KAC)

(2 weeks before 2nd cutting):



Results 2014 (KAC):

Effect of application timing on alfalfa stem count, height, and yield

Timing	Stem count ¹ (at harvest)	Harvest ² weight (lbs)	Crop height ³ (2 nd cutting)	Crop height ³ (3 rd cutting)
1. A (Dec 13)	43.8 a	41.1	22.8 a	31.5
2. B (Jan 14)	44.1 a	40.8	21.8 a	31.2
3. C (Feb 14)	40.9 b	37.5	20.0 b	30.9
CV (%)	8.58	13.70	8.97	6.26
LSD ($p=0.05$)	2.65	<i>n.s.</i>	1.39	<i>n.s.</i>

¹Number green, productive stems in a 1 ft² area, and based on three samples per sub-plot.

²Wet weight in pounds, using a Cater plot harvester, swath 6 ft wide by 25 ft long.

³Measured in inches from soil line to top of plant, and based on three samples per sub-plot.

Results 2014 (KAC):

Effect of herbicide on alfalfa stem count, height, and yield

Herbicide	Rate/A	Stem count ² (at harvest)	Harvest ³ weight (lbs)	Crop height ⁴ (2 nd cutting)	Crop height ⁴ (3 rd cutting)
1. No herbicide	0	44.5 a	43.6 a	22.8	30.1
2. Sharpen ¹	2 fl oz	44.0 a	39.4 ab	21.2	31.5
3. Sharpen ¹	4 fl oz	40.1 b	36.7 b	21.1	32.0
4. Gramoxone ¹	32 fl oz	43.2 ab	39.6 ab	21.0	31.2
	CV (%)	8.58	13.70	8.97	6.26
	LSD ($p=0.05$)	3.06	4.53	<i>n.s.</i>	<i>n.s.</i>

¹ AMS added at 8.5 lb/100 gal + MSO at 1% v/v.

² Number green, productive stems in a 1 ft² area, and based on three samples per sub-plot.

³ Wet weight in pounds, using a Cater plot harvester, swath 6 ft wide by 25 ft long.

⁴ Measured in inches from soil line to top of plant, and based on three samples per sub-plot.

Results 2014 (KAC):

Effect of app timing and herbicide on weed control and plant composition

Herbicide	Rate/A	Timing	Weed cntrl 30 DAT	Weed cntr at harvest	Alfalfa DW (%)	Weed DW (%)	
1. No herbicide	0	A (Dec-13)	0.0 b	0.0 b	96.10	3.90	
2. Sharpen	2 fl oz	A (Dec-13)	10.0 a	10.0 a	100.00	0.00	
3. Sharpen	4 fl oz	A (Dec-13)	9.9 a	9.8 a	99.56	0.44	
4. Gramoxone	32 fl oz	A (Dec-13)	9.9 a	9.8 a	99.83	0.17	
5. No herbicide	0	B (Jan-14)	0.0 b	0.0 b	97.47	2.53	
6. Sharpen	2 fl oz	B (Jan-14)	9.9 a	9.9 a	99.82	0.18	
7. Sharpen	4 fl oz	B (Jan-14)	9.9 a	9.8 a	99.82	0.18	
8. Gramoxone	32 fl oz	B (Jan-14)	9.9 a	9.9 a	100.00	0.00	
9. No herbicide	0	C (Feb-14)	0.0 b	0.0 b	99.37	0.63	
10. Sharpen	2 fl oz	C (Feb-14)	10.0 a	10.0 a	100.00	0.00	
11. Sharpen	4 fl oz	C (Feb-14)	10.0 a	9.9 a	100.00	0.00	
12. Gramoxone	32 fl oz	C (Feb-14)	9.9 a	9.9 a	99.89	0.11	
<i>Statistical notation</i>			<i>CV (%)</i>	<i>1.02</i>	<i>2.22</i>	<i>1.25</i>	<i>182.68</i>
			<i>LSD (p=0.05)</i>	<i>0.13</i>	<i>0.28</i>	<i>n.s.</i>	<i>n.s.</i>

Weed control in 2014 (KAC) (after Jan treatment):



No herbicide



Sharpen at 2 fl oz/acre

Late-dormant Trial 2015 (KAC):

Herbicide treatments and rates applied on 2/9/2015

Treat	Herbicide	Rate (product/acre)
1	Untreated	0
2	Sharpen + AMS + MSO	2 fl oz
3	Gramoxone Inteon + AMS + MSO	32 fl oz
4	Velpar + AMS + MSO	32 fl oz
5	Chateau + AMS + MSO	4 oz
6	Sharpen + Prowl H ₂ O + AMS + MSO	2 fl oz + 64.0 fl oz
7	Sharpen + Prowl H ₂ O + Velpar + AMS + MSO	2 fl oz + 64 fl oz + 32 fl oz
8	Sharpen + Velpar + AMS + MSO	2 fl oz + 32 fl oz
9	Chateau + Gramoxone Inteon + AMS + MSO	4 oz + 32 fl oz

AMS = Ammonium sulfate used at 8.5 lbs/100 gal spray volume

MSO = Methylated seed oil (Drexel by BASF) used at 1 % v/v

Alfalfa had 3 to 4" re-growth at time of treatment

Results in 2015 (KAC):

Weed control ratings on 2/23/15 (14 DAT)

Treatment	Shepherd's-purse	Chickweed	Swinecress	Horseweed	Prickly lettuce	Fiddleneck	Annual bluegrass
Untreated	0.0 c	0.0 b	0.0 c	0.0 e	0.0 c	0.0 b	0.0 c
Sharpen	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Gramoxone Inteon	9.9 ab	10.0 a	9.3 b	8.8 c	10.0 a	10.0 a	10.0 a
Velpar	9.9 ab	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Chateau	9.8 b	10.0 a	9.9 a	5.0 d	9.9 b	10.0 a	9.9 b
Sharpen + Prowl H ₂ O	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Sharpen + Prowl H ₂ O + Velpar	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Sharpen + Velpar	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Chateau + Gramoxone Inteon	9.9 ab	10.0 a	9.9 a	9.6 b	10.0 a	10.0 a	10.0 a
CV (%)	0.92	0.00	0.92	2.24	0.19	0.00	0.19
LSD (p=0.05)	0.12	0.00	0.35	0.26	0.05	0.00	0.05

Weed control based on a visual rating scale of 0-10, where 0 = no control and 10 = 100% or perfect control.

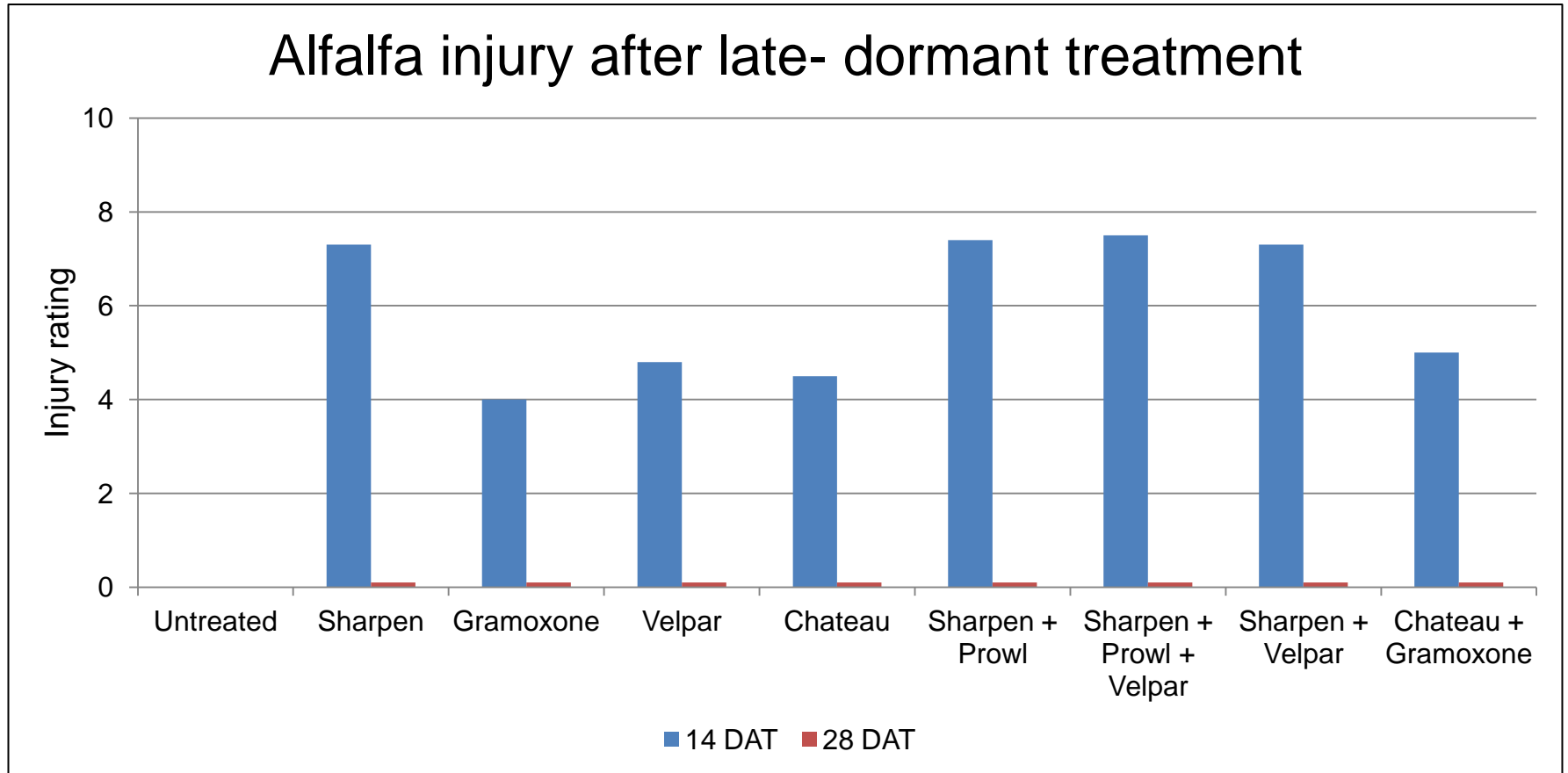
Results in 2015 (KAC):

Weed control ratings on 3/11/15 (28 DAT)

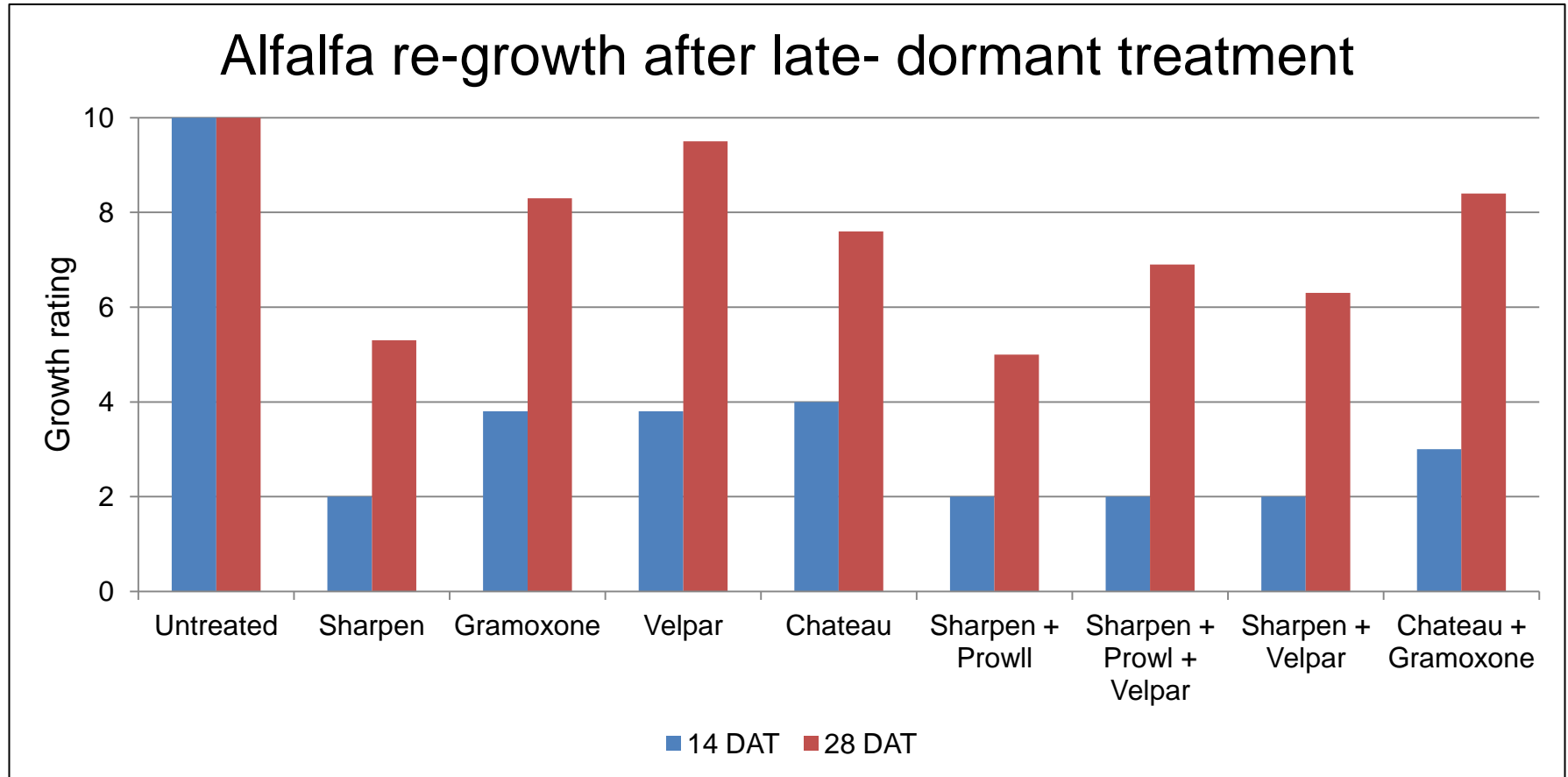
Treatment	Shepherd's-purse	Chickweed	Swinecress	Horseweed	Prickly lettuce	Fiddleneck	Annual bluegrass
Untreated	0.0 b	0.0 b	0.0 c	0.0 a	0.0 b	0.0 b	0.0 c
Sharpen	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Gramoxone Inteon	9.9 a	10.0 a	9.1 b	8.3 b	10.0 a	10.0 a	10.0 a
Velpar	9.9 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Chateau	9.9 a	10.0 a	9.9 a	3.0 c	10.0 a	10.0 a	9.9 b
Sharpen + Prowl H ₂ O	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Sharpen + Prowl H ₂ O + Velpar	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Sharpen + Velpar	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a	10.0 a
Chateau + Gramoxone Inteon	9.9 a	10.0 a	9.7 a	8.7 b	10.0 a	10.0 a	10.0 a
CV (%)	0.76	0.00	3.52	6.26	0.00	0.00	0.38
LSD (p=0.05)	0.10	0.00	0.44	0.70	0.00	0.00	0.05

Weed control based on a visual rating scale of 0-10, where 0 = no control and 10 = 100% or perfect control.

Results in 2015 (KAC):



Results in 2015 (KAC):





Results in 2015 at 28 DAT (KAC):



UNT



Sharpen



Sharpen + Prowl H2O

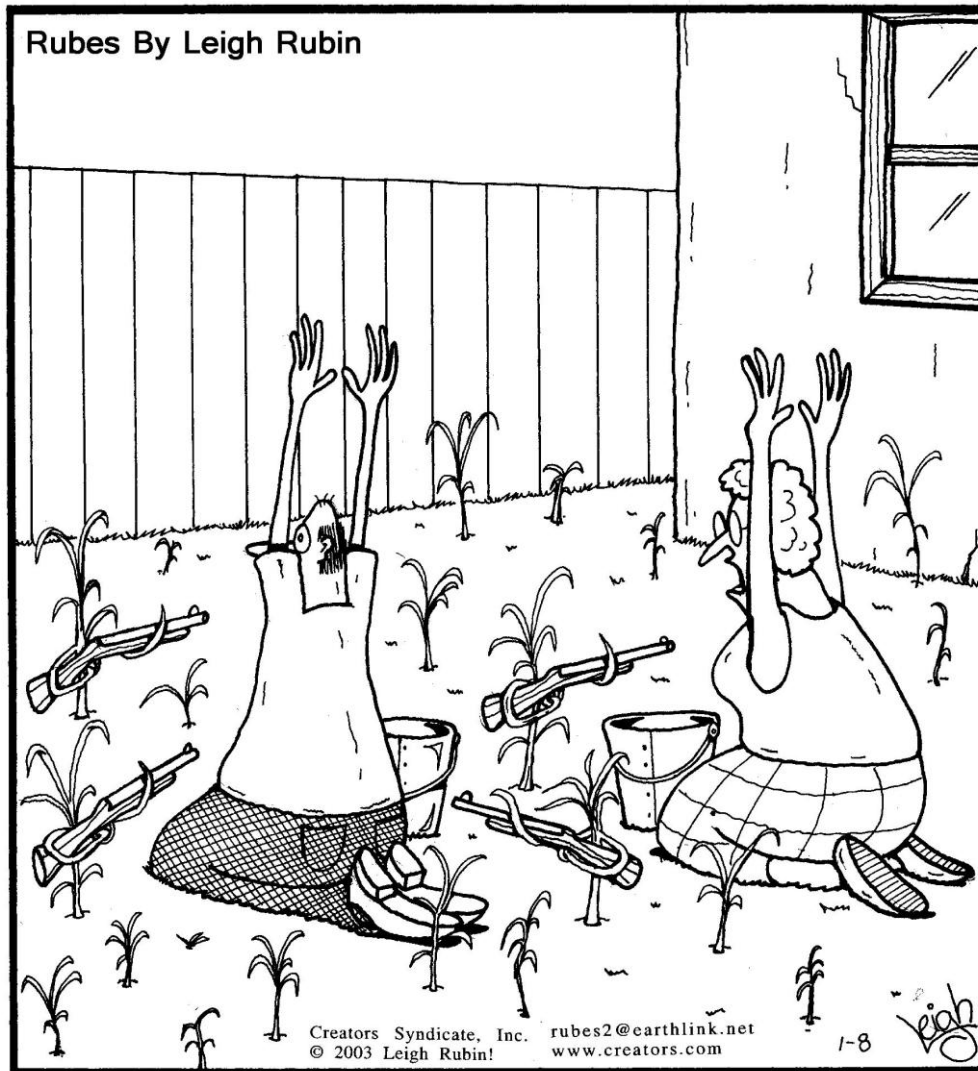


Chateau + Gramoxone



Summary

- ▶ Sharpen applied alone or mixed with other herbicides as a dormant treatment can provide excellent control of tough weeds like sowthistle, prickly lettuce, horseweed, nettle, and others.
- ▶ Sensitivity of alfalfa to Sharpen appears to be affected by timing of treatment and rate used.
- ▶ Delaying treatment with Sharpen until late Jan to early-Feb may result in lower yields during the first cutting (at least in the lower SJV).
- ▶ Additional work is continuing with this and other herbicides.



"We never should have waited this long ...
Now the weeds have *completely*
taken over."