

## COMMON GROUNDSSEL, AN INCREASING PROBLEM IN THE LOW DESERT

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### Background

Common groundsel (*Senecio vulgaris*) is a difficult to control, poisonous weed that has become established in LaPaz County and is becoming increasingly widespread. This weed has been present in alfalfa grown at higher elevations for many years but did not become established in the low desert production areas until recently.

Common groundsel belongs to the composite or sunflower family. This family comprises about 900 species including many weeds that have been historical problems, including sowthistle, prickly lettuce, marstail, sunflower, camphorweed, cocklebur, povertyweed, dandelion, thistles and others. This family also includes several major crops including lettuce, artichokes and flowers such as chrysanthemum, marigold and daisy. Common groundsel contains pyrrolizidine alkaloids (PA), which are toxic to cattle and horses. PA does not seem to affect sheep. Other weeds in the *senecio* genus, such as tansy ragwort (*Senecio jacoboca*), are more toxic.

Small and isolated infestations of this weed have been reported over the past several years in the low deserts. The first large scale and heavy infestation was reported about 6 years ago in La Paz County, AZ. This weed has now spread into alfalfa throughout La Paz and Riverside Counties. No confirmed findings have been reported in Yuma County.

The seed from this weed is easily dispersed by wind, water, machinery and animals. It flowers at the same time sheep graze alfalfa fields. The proliferation of groundsel can also be correlated to the widespread use of the imadazlionone herbicides, Raptor and Pursuit, which are weak on this family of weeds.

## Economic Impact

Common groundsel is a winter annual that begins to emerge in October and is present until May. Typical cutting dates, yields and value of alfalfa in Parker, AZ are presented in Table 1.

Cutting Date	Yield (T/A)	Price (\$/T 22yr. ave.)	Value (\$/A)
Feb.	0.98	101	99
Mar	1.46	104	152
May	2.16	94	203
June	2.21	80	177
July	1.79	80	129
Aug.	1.03	72	74
Sept.	0.84	72	63
Nov.	0.69	95	66

Table 1. Cutting date, yield and value of non-dormant alfalfa in the low desert.

The yield and value information used in this table are taken from “Alfalfa market prices – 1981-2002, Yuma Co. Farm Notes, Jan. 2003” and “UC Imperial Alfalfa Cultivar Trial 2001 yields, Feb. 2002.”

The cuttings that are affected by this winter annual weed are those that are produced in November, February and March. The annual value of these cuttings from the above table is \$317/Acre. Common groundsel is considered a poisonous weed and much of the hay containing significant amounts of this weed cannot be sold to dairy, feedlot or retail markets. Groundsel is not poisonous to sheep and it can be grazed. Sheep grazing normally returns 20 to 30 dollars per acre to the grower. Subtracting this from the value of the November, February and March cutting brings the approximate loss due to common groundsel at \$290 per acre.

According to the University of Arizona Herbarium, Common groundsel has largely been an urban weed with samples occasionally being collected in urban landscapes. Prior to our first finding in 1998 in the Butler Valley of La Paz County, it had not been reported as an agricultural problem. Over the past six years this weed has spread throughout the Parker Valley. Infestation estimates by alfalfa growers and pest control advisors range from 10 to 15 percent or 6300 to 9450 acres. Common groundsel has not yet been reported in alfalfa in any other county in Arizona. It has spread to almost 10,000 acres in La Paz County over the past six years and continues to spread. At a value of \$290/Acre, this represented a loss of approximately \$1,827,000 to \$2,740,500 in 2003.

## Control Options

Common groundsel is a problem both in new alfalfa that has been planted in the fall and older stands that have become weak. A healthy, thick stand of alfalfa that is cut frequently seldom has serious weed problems. Cutting frequency decreases during the winter months due to slower growing conditions and this is when groundsel is most troublesome. Herbicides are needed at this time of the season to keep weeds in check. Since groundsel is a relatively new weed in Arizona alfalfa, information on the efficacy of currently available and potential new herbicides for controlling it in the low desert was not available. Therefore, a test was conducted during the 2003-2004 season to evaluate herbicides for efficacy and crop safety.

The test was conducted in a second year alfalfa field heavily infested with common groundsel along Mohave Road, North of Agnes Wilson Road. The test contained six preemergence and five postemergence herbicides. The preemergence treatments were applied on 10-29-03 when the alfalfa was 1-3" in height and the postemergence treatments were applied on 11-25-03 when the alfalfa was 4-12" in height and the groundsel was 1 leaf to 3 inch rosette. These treatments were applied with a backpack sprayer calibrated to deliver 20 gallons of spray solution per acre. The plot size was 42' by 100' with 3 replications. Visual evaluations of percent control were made on 1-28-04. Table 2 summarizes the trial results.

Table 2: Control of Common groundsel in alfalfa.

Herbicide	Rate (A)	Time	Control (%) *
Eptam 7E	4 pts.	Pre	37 c
Zorial 80	2.5 lbs.	Pre	92 a
Velpar 2L	2 pts.	Pre	97 a
Sencor 75 DF	0.6 lbs.	Pre	57 b
Visor 2EC	2 pts.	Pre	90 a
Chateau WG	4 oz.	Pre	95 a
Sencor 75 DF	0.6 lbs.	Post	90 a
Velpar 2L	2 pts.	Post	98 a
Gramoxone Max 3 EC	2.7 pts.	Post	87 a
Pursuit 2 EC	6 oz.	Post	68 b
Raptor 1 EC	6 oz.	Post	68 b

\* Ave. of 3 reps

LSD (0.05)=5.97

Letters in "Control (%)" after numbers are used to indicate statistical differences. Numbers with the same letter are not statistically different from one another.

Control with the preemergence treatments ranged from 37% with Eptam to 97% with Velpar. Eptam was sprayed on the surface and incorporated with the irrigation water within 2 days. Better deposition and control may have been achieved if it had been applied as a water run application. Velpar has been used for 20 years on dormant and semi-dormant varieties with excellent results but an Arizona registration for low desert production is not likely because of crop injury observed to non-dormant alfalfa. Chateau SW also produced excellent control in this test. This is a new herbicide produced by Valent that is currently registered for use in soybeans, peanuts, and cotton. Registration is being actively pursued in Arizona and California on alfalfa. Visor also produced very good to excellent control. Visor is produced by Dow Agro Sciences and is currently registered on oranges and grapefruit but Dow is not currently pursuing a registration in alfalfa. Sencor is registered for use in alfalfa following sheepling or cutting when little crop foliage is present and provides excellent control of groundsel in postemergence applications. Poor control of common groundsel was achieved with preemergence applications of Sencor. The only currently registered herbicide that produced excellent preemergence control in this test was Zorial. Excellent early postemergence control was achieved with Velpar and Sencor. Gramoxone produced good control when applied to very small weeds with good coverage. Larger weeds or those receiving partial coverage would not ordinarily be controlled. Buctril is another contact herbicide that was not included in this test because it is registered only on seedling alfalfa. Both Pursuit and Raptor were weak on this weed.

In addition to weed control, crop safety to both the current and potential rotational crops is a concern. Table 3 illustrates the crop safety of the herbicides included in this test. Eptam, Zorial and Visor all were very safe to the alfalfa. Chateau SW, Pursuit and Raptor produced moderate crop injury. Pursuit and Raptor caused stunting and shortened internodes. Injury from these herbicides was temporary, lasting 20 to 30 days. Sencor, Gramoxone and Velpar produced unacceptable crop injury. Sencor caused severe chlorosis and stunting. Velpar caused severe leaf burn, bronzing and stunting. Gramoxone burned off all of the crop foliage present at the time of application. The new growth was normal.

Table 3. Safety of herbicides to alfalfa (% phytotoxicity)

	0-10	10-20	20+
Eptam			
Zorial			
Visor			
Chateau			
Pursuit			
Raptor			
Sencor			
Gramoxone			
Velpar			

Residual herbicide activity is a concern throughout Arizona where alfalfa can be rotated at any time to vegetables and other field crops. In La Paz County, the principal crops are alfalfa, cotton and grain. Table 4 illustrates the plantback intervals for the herbicides included in this test. These range from 0 to 40 months, depending upon the crop to be grown. Herbicides with plantback restrictions of greater than 12 months are often avoided in the last year of an alfalfa crop. Of the eight herbicides included in this test, only Eptam, Gramoxone and Chateau SW can be considered safe to the most sensitive rotational crops grown within one year of the last application. Zorial is a pigment inhibitor that produces a distinctive lack of chlorophyll in affected crops. It has been difficult to use in Arizona except in long term perennial crops such as trees and vines. Chateau SW, on the other hand, has been found to be safe to most crops in less than 12 months after the last application.

Table 4. Plantback interval (Months)

Eptam	0
Gramoxone	0
Chateau	1-12
Zorial	1-16
Senecor	4-18
Raptor	3-26
Pursuit	4-40
Velpar	12-24

## Summary

Common groundsel is a difficult to control, poisonous weed that has become established in LaPaz County and is becoming increasingly widespread. Economic losses in 2003 have been estimated to be nearly \$3 million and are likely to be higher in 2004.

Tables 5 and 6 summarize the weed control, crop safety and plantback restrictions for the herbicides evaluated in this test. The plantback intervals for Visor have not been established in the low desert and the manufacturer of this product is not currently seeking new registrations.

Table 5. Control, safety and plantback interval for preemergence herbicides in alfalfa.

### Preemergence

<b><i>Herbicide</i></b>	<b><i>Control</i></b>	<b><i>Safety</i></b>	<b><i>Plantback</i></b>
Eptam	Poor	Good	Good
Sencor	Poor	Moderate	Moderate
Visor	Very good	Good	?
Zorial	Excellent	Good	Poor
Chateau	Excellent	Good	Moderate
Velpar	Excellent	Poor	poor

Table 6. Control, safety and plantback interval for postemergence herbicides in alfalfa

### Postemergence

<b><i>Herbicide</i></b>	<b><i>Control</i></b>	<b><i>Safety</i></b>	<b><i>Plantback</i></b>
Pursuit	Poor	Moderate	Poor
Raptor	Poor	Moderate	Moderate
Gramoxone	Very good	Poor	Good
Senecor	Very good	Poor	Moderate
Velpar	Excellent	Poor	poor

Visor, Zorial, Chateau and Velpar were the preemergence herbicides that were effective in controlling groundsel. Only Zorial (Solicam) is currently registered. Gramoxone, Sencor and Velpar were effective post emergence. Velpar is not registered in the low desert and crop safety was poor for both Sencor and Gramoxone.

Other herbicides that are registered on alfalfa in Arizona that were not included in this trial are: Balan, which is only registered as a preplant treatment; Trifluralin and 2,4-DB, which have been tested in other areas and found to be ineffective on common groundsel; Poast and Select, which are effective only on grasses; and Buctril, which is registered only on seedling alfalfa.