

WEED CONTROL PRACTICES IN NORTHEASTERN CALIFORNIA

"Why we are different"

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WHY IS THIS GROWING AREA DIFFERENT FROM THE REST OF CALIFORNIA?

Many times I have found that we have the right answer, but it is to the wrong question. Before one can develop a correct and meaningful answer, one must first fully understand the question.

Mountains and Elevation

The alfalfa growing areas of Northeastern California lie in valleys in this mountainous region of the state. These valleys vary in elevation from 3,000 feet to over 5,000 feet above sea level. Valleys through out the area with similar elevations have about the same growing seasons and frost danger.

The mountains themselves form a barrier that naturally keep some insect pests from migrating to the area. Of course the harsh mountain winters prevent many insect pests from overwintering and becoming a problem. Likewise, the mountains are a barrier that must be overcome in order to get the hay to the dairy markets of California.

Growing Season

The growing seasons of the mountain valleys are much shorter than what the Sacramento and San Joaquin Valleys enjoy. Lassen County's Honey Lake Valley is at 4,200 feet above sea level. When describing the growing season, I normally use sweet corn as my frost sensitive indicator crop. Generally speaking, the last killing frost is sometime close to Memorial Day in May and the first killing frost is near Labor Day in early September. Of course this varies from year to year, but it generally holds true. After the first killing frost in September, it is normal to have a long frost free indian summer until late October.

The higher valleys and areas like the Tulelake Basin do not have the same "long" growing season that the lower Honey Lake Valley has. It has been said that these other areas can and have had frost any day of the year. This fact makes it quite impossible to grow frost sensitive crops with much likelihood of success.

The winters are cold and harsh. Alfalfa goes completely dormant. Alfalfa fields without snow cover are hardly recognizable because they look like brown bare fields.

Alfalfa growth starts in March when the fields start to green up. The days warm up to about 60° F while the nights are still below freezing. Needless to say, the alfalfa grows very slowly. It is common to have frost nip back the tender alfalfa shoots as late as the first part of May. Depending on the spring, the first harvest may start as early as May 15th, but may be delayed as late as about June 20th.

The summers are warm with temperatures in the 80's and 90's with occasional hot spells in the 100's. Alfalfa grows much quicker resulting in lower hay quality for the mid summer cutting.

Cutting Schedule

The different elevation valleys can also be easily classified as to the number of cuttings that growers can harvest each year. Generally speaking, valleys below 4,000 feet harvest 4 cuttings. Valleys between 4,000 to approximately 4,800 feet are classified as 3 1/2 cutting areas. Valleys over 4,800 usually only yield 2 1/2 or less cuttings per year.

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Slow Growing High Quality Hay

This less than perfect climate does have some positive side effects. It takes from 60 to 65 days to make the first cutting of alfalfa hay in Northeastern California. The cool weather slows the growth of the hay, thus allowing the growers to harvest large quantities of first cutting hay with exceptionally high feed values. Unfortunately, growers are not always able cash in on this quality if rain comes when this hay has been cut.

Stand Longevity

Alfalfa stands can remain highly productive for more than six years in the intermountain area. The secret to profitability for the alfalfa grower is to keep the yield and quality high for the hay produced from these old fields. Many of these valleys do not have a profitable rotation crop to grow with alfalfa. Therefore, it is absolutely essential that alfalfa stands stay productive for seven to nine years. This can be accomplished through good agronomic practices which definitely includes weed control.

WEED SPECTRUM - HOW IS IT DIFFERENT?

The following are lists of weeds that are common problems in the intermountain area. The lists that are titled as "same" are weeds that are also common to the Sacramento and San Joaquin Valleys. The lists that are titled as "different" are common to the intermountain area but not the lower valleys.

WINTER ANNUALS

<u>Same</u>	<u>Different</u>
shepherd's purse	tumble mustard
prickly lettuce	flixweed/tansey mustard
hare barley(foxtail)	cheat grass(downey brome)
	yellowflower pepperweed
	bulbous bluegrass

SUMMER ANNUALS

<u>Same</u>	<u>Different</u>
dodder	
foxtail(setaria)	
barnyard grass	
pigweed	
lambsquarter	
Russian thistle	

PERENNIAL WEEDS

<u>Same</u>	<u>Different</u>
cheeseweed(malva)	common dandelion
foxtail barley	chicory
	plantain
	Kentucky bluegrass
	quackgrass
	perennial rye
	tall fescue
	Nevada bluegrass

WEED MANAGEMENT DIFFERENCES

Timing and Environmental Conditions

With completely dormant alfalfa in the winter along with long, cold springs, normal weed control

practices are adjusted to a time schedule that is generally later than the lower valleys. Herbicides have a longer window for application in the spring. Winter herbicide applications have to be delayed if the ground is covered with snow. Likewise, spring applications of herbicides such as Treflan 10G for dodder control, is later by a month to a month and a half. Growth of the spring germinating summer annuals does not start until the soil starts to warm.

Winter environmental conditions such as extreme cold, high light intensity, and drought tend to harden winter annual weeds that germinate in the fall. These hardened weeds do not react the same way to chemicals as the non-hardened weeds of the same species. On the positive side of the harsh winters, the alfalfa is completely dormant with no foliage protecting weeds and interfering with herbicide soil contact.

Chemical Tools

The vast majority of our chemical tools available for weed control work are for winter annual weeds. We have been relatively successful in eliminating winter annual weeds from the first cutting of our hay. But, with these weeds gone, we have opened the door to other summer and perennial weeds by reducing competition.

Simazine and Sinbar are two of the herbicides that we have recently lost due to the re-registration process. Simazine has been a tremendous loss because it was the main herbicide used for winter annuals by the majority of the growers. Not only did it work good, but it was inexpensive.

Diuron/Karmex is not widely used in the intermountain area because of the widespread cheatgrass infestation. Diuron/Karmex is good on most of the other winter annual weeds, but it is weak on cheatgrass.

Poast hasn't found a place in the intermountain area yet because it is not very active on our grasses during the long, cool springtime.

Paraquat by itself has not given consistent weed control due to the winter hardened weeds. The weeds growing under high light intensity, drought, and cold are partially protected from paraquat damage. Research in the intermountain area has shown that **paraquat tank mixtures** with lower than normal rates of Velpar or Lexone/Sencor greatly enhance the activity of paraquat as a contact herbicide. These low rates (.25 lb. a.i. per acre) are not high enough to account for the increased weed control that is attained with this tank mixture.

Velpar and the metribuzin products Lexone and Sencor are the mainstay of the weed control programs in the intermountain area. These products have soil activity as well as contact activity and control the majority of the winter annual weeds that are a problem.

Kerb is about the only herbicide that we have that can control some of the problem perennial grass weeds. It is very expensive and should only be used on spots or on young, healthy alfalfa fields that are worth the investment.

Spring applications of **Treflan 10G** has proven to be quite effective in controlling dodder and the green and yellow foxtail (Seteria) where these weeds have become a problem. Fortunately, green and yellow foxtail is not widespread in the intermountain area and we have the tools to control it.

THE BEST WEED CONTROL METHOD IS A HEALTHY, VIGOROUS STAND

I have had the opportunity to view some alfalfa fields that are five, six and seven years old that still have thick stands, yield well, and produce quality hay. Weeds are not a problem in these fields. I have had people tell me that as long as they have fields that produce quality hay, yield well, and have thick stands, then weeds won't be a problem. Perhaps they have missed a very obvious point. These "good" fields are "good" because of a combination of factors. One of the main factors is that there are no weeds that have become a problem in these fields.

Unsuitable Soils

When I first came to Lassen County, I was told that the reason that we have a perennial grass problem in the area is that alfalfa fields were planted on unsuitable soil types. I have to agree that the fields that were planted in wet areas and had high perched water tables or were subject to springtime flooding, were not fields that alfalfa could survive. The problem with the "unsuitable soil" reasoning is that perennial grasses were also a problem in some of the better soil sites with deep well drained soils and correctly designed irrigation and drainage systems. Many of these problem perennial grasses that plague alfalfa fields, are the same grasses that were encouraged in the irrigated pastures and improved ranges.

Grasses Have an Ecological Competitive Advantage

Irrespective of the vigor and alfalfa plant population, some grasses like cheatgrass and Kentucky bluegrass have the ability to invade a healthy field. Kentucky bluegrass, once it is established, can actually choke out alfalfa. This is possible because of an ecological competitive advantage.

Perennial grasses start growing two to three weeks earlier in the spring than alfalfa. Many of the species are low growing and have many intact leaves after all of the alfalfa has been cut off in the mowing process. The grasses continue to grow when the alfalfa has to re-build the entire plant by drawing from its root reserves. The fibrous root systems of grasses can effectively mine nutrients as well as moisture. If this weren't bad enough, the nitrogen supplied to the soil by the alfalfa stimulates the grass growth.

A Good Field Gone Wrong!

(A case study of what not to do)

I have had an opportunity to watch the intrusion of Kentucky bluegrass into a thick, healthy alfalfa stand that was on a deep well drained and well irrigated field. One major thing that should be noted is that this was in a higher elevation valley that is classified as a 2 1/2 cut area. When 3 cuttings are taken, the alfalfa stand is severely weakened. The following chart outlines the invasion by year and the effect on the alfalfa.

<u>Year</u>	<u>Weeds</u>	<u>Alfalfa</u>
after planting	minimal	good, healthy stand
1st year	1st cut: cheatgrass, flixweed, shepherd's purse. No herbicide. 2nd & 3rd: clean	3 cuttings + grass competition = weakened stand
2nd year	1st cut: cheatgrass, flixweed, shepherd's purse. No herbicide. 2nd & 3rd: Kentucky bluegrass starting to show up. Plant 1=2" dia.	3 cuttings + grass competition = weakened stand
3rd year	1st cut: Herbicide applied, clean except for K. bluegrass starting to take off. 2nd & 3rd: K. bluegrass really growing.	3 cuttings stand already weakened stand starting to thin
4th year	K. bluegrass sodded over, very digestible feed but very low yield.	sparse stand low yield should be taken out "Death before its time!"

HOW TO MAINTAIN A HEALTHY VIGOROUS STAND

The rules have not changed and it doesn't matter if you are growing alfalfa in the Northeastern mountain valleys or the Sacramento and San Joaquin Valleys. The good agronomic principles that allow alfalfa to grow at its best advantage are the same everywhere.

Good Soil

My grandfather always told me, that if I am to grow the very best crop possible, then I must first choose the very best soil available. If we start with a deep, well drained soil with a good level of natural fertility, then we have made the first correct choice. If we are starting with something less, then the result will be less.

Good Irrigation and Drainage

Adequately designed and operated irrigation systems are essential for growing alfalfa in the arid west. I have seen people skimp on irrigations because their power bill was too high, only to lose more money in yield than what they gained in savings. Over irrigation, on the other hand, hurts two ways. Not only do you have to pay for the water, the excess water does more damage than good.

Varieties Are Important

Factors such as dormancy rating and pest and disease tolerance ratings should play a major role in selecting the correct varieties to choose from.

Proper Soil Fertility and Plant Nutrition

Groceries make kids grow up big and strong and fertilizers allow alfalfa to make hay. Soil and plant tissue analysis are great tools to help determine if something is missing. Strip tests prove if a fertilizer applied will pay for itself.

Appropriate Cutting Schedules

With the emphasis of hay quality determining the price, growers are cutting alfalfa on a shorter schedule in order to harvest only the best. While you can get away with this for a short time, you are paying the price by depleting the alfalfa plants root reserve. Cutting management should include at least one longer cutting interval per season to restore what is taken out. Otherwise, when the reserves are gone, so is the plant.

Maintain Good Weed Control

For Northeastern California, the first three years of an alfalfa stands life are the most important years for determining how long the stand will be productive. By getting it off to a good start and keeping weeds out as the alfalfa plants reach their full productive capabilities, you are well on your way to attaining that healthy, vigorous, weed free, profitable alfalfa field that you desire.