

Weed Control Challenges in Desert Areas of Southern California

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In the beginning, there were weeds. When I began my career in the mid nineteen seventies, there were many surprises awaiting me. The Primary Crop was Alfalfa for hay production. It occupies the most acres of irrigated land. Small grains for hay, sudangrass, onions, carrots, potatoes, stone fruits, pears and apples are also grown here.

Visiting alfalfa producers, I found several items that were troubling. Many growers had difficulty establishing good fields, many older fields had problems with serious perennial weeds. Control of summer and winter annual weeds was erratic. Many fields were being overtaken by dodder. There were weeds that people couldn't identify or control. Several steps would be needed to address these issues. First identify the weeds. Get help if needed, but that is the first step. Second, learn why these weeds are there. Third, come up with a plan to control these weeds if possible, using an integrated, agronomically sound system.

Weed identification was done mostly from academic training and resource books, at that time the Growers Weed Handbook was still coming out. The older Weeds of California was useful. Some local weeds required help from the County Ag commissioners and UC Extension to identify. The most important and common weeds were:

Annual Foxtail Barley, Downy Brome, Rescuegrass, Annual Bluegrass, Schismus Sps., Volunteer grains, London Rocket, Tansy mustard (flixweed), Red-stem filaree, Malva, Shepardspurse, Common Groundsel, Fiddleneck, tumbling mustard, Russian thistle, prickly lettuce, Annual Sowthistle, Thyme-leaved speedwell, Buckhorn Plantain, Dandelion, Lambsquarter, Pigweeds, Crabgrass, Setaria foxtails (millets), Watergrass, Dodder, Bermudagrass, Johnsongrass, and a mixture of strange, exotic and domesticated species.

Common Groundsel was present in abundance in several fields in the Antelope Valley area. Further analysis revealed that these growers had been using Diuron herbicides at low doses for many years. The groundsel thrived in this competition-free environment. Many of these growers were not aware that groundsel was toxic to animals. Some of this hay was sold to feed stores catering to horse owners. Several years later I was called as a weed expert to identify weeds in hay at a feed store. The concern was that about 20 horses had developed severe jaundice and were dying. Poison weeds were suspected. The analysis of the hay showed some marehail but no toxic weeds. The problem was that the damage was done months earlier when these horses had been fed groundsel-infested alfalfa. The symptoms can take months to show up, at which time it

is too late to save the animals. There was no way to track where the hay that really caused the problem came from. This incident became a major incentive to solve this problem. Another grower made “Premium Horse pellets” with groundsel infested hay. In subsequent years, the growers began to use Paraquat and then Velpar, with Diuron. This was a very effective treatment for groundsel. These mixtures are still our primary treatments for winter weeds. The Goundsel case is an example of weed selection by eliminating its competition.

Annual Foxtail Barley was the other major problem occurring virtually every year. Many fields had to have the first cutting sent to the hay grinders to be milled into pellets, at a substantial loss of income to the growers. The introduction of Paraquat and Velpar also greatly aided in control of this weed. Foxtail would germinate early in some years and become well enough established to survive diuron treatment, adding Paraquat or Velpar would control these tough weeds.

Control of the regular winter annuals has been generally good with the existing tools, but we are seeing reduced effectiveness and selection pressure in favor of perennials over time. It has been many years since we have used new materials in this market. Chateau is being used a little in our area, but is very expensive and not as effective as our standard treatments.

Dodder has been a constant problem, although today many people forget how bad it was. The main reasons it was so bad were that most High desert hay was grown in long rotations, patches were allowed to go to seed and there was no effective preemergent control for many years. Growers blamed birds, sheep, their neighbors and a host of other reasons. The real main culprit was cheapskates who bought homegrown seed from their neighbors that was infested with dodder seed. Some farmers tried deep plowing, but this usually was not effective. Burning was the main method used to control attached dodder. This was not fun on a 110 degree desert day. Later, Dow General was used mixed with oil as a contact killer. This was easier than burning, but required repeat treatments and was eventually banned by the EPA. Fail mowing was found to be effective if done all the way to the ground, and is still the best non-chemical treatment. In the early 1980's Treflan herbicide was made as a 10% Granule. This product was very interesting because it offered a way to pre-emergently control grassy weeds like Setaria sps. that were infesting a lot of alfalfa in California. We applied some for grass control and found it also worked quite well on dodder. Steve Orloff got hold of this information and ran with it. He did research on when dodder germinated, when treatments should be applied and what materials were most effective. To this day, that is the gold standard on dodder recommendations. Prowl was shown to be even better than Treflan. Today we apply Prowl H2O at 2 to 4 quarts per acre per year and get excellent results. Results are much better on newly planted fields than older fields with many dead spots. The development of Roundup Ready Alfalfa will also help, as this treatment will control attached dodder. My personal opinion is that we should still control dodder with pre-emergent materials and follow up with Roundup-ready where this is an option. Previous attempts to go with a post emergent only program have not been very successful. The contaminated seed problem continues to this day. Some growers have achieved very good

control for many years, then rotated out of alfalfa, and planted back after 3 years and been badly infested again. When they did tillage, they brought up buried seed that came from the earlier years of heavy infestation. This problem will be with us for a long time.

Many of the weed problems come from less than optimum farming practices. In the earlier days, we stressed cultural practices and the effect they had on weeds. Many people have gotten used to good herbicide results and tried to get by with shortcuts. A thick stand of healthy, well fertilized vigorous Alfalfa is still the best weed control we have. Poor stand establishment was a problem for many growers. Some tried to compensate by increasing seeding rates, but this was not effective, because Alfalfa self-thins to the same population density. Weed competition in newly planted Alfalfa is very harmful to stand life and overall profitability. This has been one of the most difficult aspects of Alfalfa production.

Early practices focused on 2 materials post emergent: 2,4-DB and IPC(chem.-hoe). These were effective but had many problems: timing was critical, irrigation management was very complicated and they could adversely affect the growth of the alfalfa. Balan and Eptam were used as pre-plant treatments, but were poor choices for fall planted hay in our area. Kerb was developed and used for several years as a replacement for IPC. Finally Poast was approved and this was a big step ahead, a safe and selective effective post-emergent material. Poast has declined in use and today Selectmax (or generic forms) dominate this use. Pursuit and Buctril were developed to replace 2,4-DB. They are outstanding on many weeds, especially mustards, malva and filaree. But they miss Prickly lettuce and Sowthistle, so if these weeds are a problem, Buctril or 2,4-DB can be tank mixed. Many growers are using low rates of all 3 together. Raptor is the follow up to Pursuit. It adds grass control and less carryover. Pursuit is still popular because it gives longer residual control than Raptor. Some people are combing low rates of these two products to get broad spectrum and long residual. We also use Selectmax, even with Raptor, to go after seedling Bermudagrass. Often volunteer grain emerges early and in abundance, so we will apply Selectmax early and come back with a second application for the other weeds.

Time of seeding has been a critical issue in the High Desert. The optimum time is late August or early September. If planting is delayed, seedling growth is slowed significantly. 2 weeks can make all the difference. The competitiveness of the Alfalfa is reduced and the danger of severe wind damage is greatly increased. Unfortunately, we have seen many fields literally blow away in the winds of October and November. Spring planting usually is a disaster. Cover cropping is a good insurance measure on sandy soils. Typically, small grains are used for this and controlled by herbicides before they can damage the stand. In some years, we will see low temperatures of 0-10 degrees. Some fields have been winter-killed. Variety selection is also important in this regard. Other important cultural controls used in this area are: Time of cutting management, Good weed control in rotational crops(use 2,4-D when you can), avoidance of nitrogen fertilizers if possible, plowing down manure applications instead of top-dressing and planting clean seed.

Roundup-Ready Alfalfa is being planted on a limited basis. Some growers export hay and they want to avoid it. Many growers feel that their existing practices are working fine and don't like the added expense. The advantages in seedling establishment, spot control of dodder and effectiveness on perennial weeds will make RR more popular in the future. Our experiences so far show us great results on seedling weed control, although follow up treatment will be needed. I believe an approach of using RR Alfalfa and residual Herbicides will be the future direction we need to go in.

It is very important that we retain our older products also. 2,4-DB has come and gone a couple of times. We keep finding uses for it, even though it is 50 years old. The cost of development of new herbicides is ridiculous. The chicken little-activists will keep going after our essential products because their paranoid fear is greater than our ability to explain the truth to them.

Application practices have changed over time. Today many products are applied by chemigation, where approved. Center Pivots have enabled this to be quite effective, although very good management and skill are needed to make it safe and effective. Most products are applied by ground-rigs. Air application has virtually ceased in this area. Weed control results have generally been better by ground. The high winds and low humidity can be very challenging at times. The desert water sources, mostly ground water, can have very high pH and mineral contents. Adjuvant use is essential with many products.

We have made some major steps ahead in the quest for high quality hay in our region. This is a good legacy to pass on to future farmers and those that work with and advise them.