

WEED MANAGEMENT IN SEEDLING ALFALFA

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Preparing for a new stand of alfalfa is much like building a house. No matter how much money is spent on appearance, it is virtually useless without a good foundation. In preparing for a new stand of alfalfa, one must also put the time and materials necessary to sustain a profitable, long-term investment. One of the most important management inputs to achieve long-term, profitable hay is establishing a fast-growing, weed-free (at least low amount of weeds) stand. In fact, controlling weeds early not only pays from a quality standpoint at each cutting, but it will allow the alfalfa to compete more aggressively against persistent weeds and grasses in following years. Despite out technological advances in the area of herbicides, crop competition is still one of the best methods of weed control. It is no secret that good performance from a herbicide is directly related to a vigorous, healthy stand of alfalfa. Oftentimes weed growth is allowed to become so large that chemical spraying is rendered ineffective.

Preplant - Pre-emergence: (Timing of herbicides)

Herbicides are usually broken into two categories: preplant and postemergence. Pre-plant herbicides are applied to the soil just prior to planting the crop. Most must be mechanically incorporated and activity begins (weed killing) when herbicide comes into contact with sufficient moisture. One should apply such herbicides as close to planting as possible to allow full benefit from the herbicide's life. Pre-plant incorporated (PPI) herbicides have a wide spectrum for controlling broadleaf and grasses. However, as good as this may seem, invariably, there are resistant weed types left uncontrolled. One must know his weed type before selecting the right herbicide for the job. With luck, a single application of a PPI herbicide may give you enough control and time for the alfalfa to emerge and canopy the soil surface to minimize later-germinating weeds.

Postemergence Herbicides:

Many alfalfa growers, due to their specific weed type, timing, or other reason, forego the use of PPI and elect to use postemergence types. These herbicides are applied under a wide range of conditions but usually when the alfalfa reaches a safe stage for treatment (two trifoliates or larger). These herbicides fall into two categories: contact types and soil-active types.

Contact types can be selective or non-selective, meaning some will burn back all weeds including the alfalfa, some only weeds. The alfalfa usually being a deeper-rooted perennial crop will recover from being burned and re-grow to a nice, lush stand. Annual weeds, if burned at a small enough stage, are killed or severely stunted beyond any further concern.

Caution must be exercised, when using non-selective contact types, that alfalfa size and vigor is at a safe stage.

Postemergence selective-type herbicides cause very little injury to the alfalfa but kill weeds by either translocating through the foliage or are taken up through the soil via the root system. Caution should be exercised in selecting the proper herbicide for the weed type and size, alfalfa stage, and weather requirements for use.

Herbicides Used in Seedling Alfalfa

Pre-Emergence

Balan
Eptam-Genep
Chemhoe

Postemergence

2,4-DB
Chemhoe
Gramoxone (paraquat)
Kerb
Poast (Sec. 18)

Possible limitation of various herbicides:

Balan: Good on grasses, chickweed, and redmaids; weak on many winter broadleaves

Eptam-Genep: Good on many grasses and broadleaves; short duration of control, 4-6 weeks.

Chemhoe: Good on grasses; very little control on broadleaves

2,4-DB: Effective on many broadleaves if small and growing vigorously. No effect on grasses. Very erratic under cold, foggy conditions.

Paraquat: Effective on annual grasses and many broadleaf seedlings; may reduce stand if applied too early.

Kerb: Effective on many grasses and small broadleaf weeds; moisture sensitive. Must be water incorporated.

Poast: Effective on most annual grasses, except bluegrass. No control on broadleaves.

In the early days of alfalfa establishment, weeds were accepted as part of the normal process. Growers felt that given a reasonable alfalfa population, weeds could be removed by mowing or reduced by swather cutting during the harvest season. A "Nurse Crop" concept was adopted with the logic that overseeding a desirable winter grain crop with alfalfa would compete against winter weeds and provide a more desirable source of feed. This practice is still used by many growers. However, with the development of many useful herbicides for alfalfa, weed-free seedling stands are what we strive for.

In 1978 a weed competition in seedling alfalfa study began on the Davis campus. Dr. Robert Norris, University of California, Davis, undertook a study comparing various weed types and their competition to yield and stand on newly seeded alfalfa.

His findings were summarized as follows:

- Losses due to weed competition, if left uncontrolled, can be 100% by the first cutting.
- Weed species differ greatly in their effects on alfalfa.
- Losses due to winter weeds on fall-seeded alfalfa persist for several cuttings, or as long as the first growing season.

Some weed species can cause a substantial loss of the seedling stand

Vigorous alfalfa at first cutting will substantially reduce invasion of summer weeds.

Table 1

Influence of Various Weeds in A Seedling Alfalfa Stand
Seeded 10/18/79
Results 10/3/80

<u>Weeds</u>	<u>Seeding Rate</u>	<u>Alfalfa 1st Season Yield/tons/A</u>	<u>Weed 1st Season Yield/tons/A</u>	<u>Alfalfa Plants/sq² End 1st Season</u>
Hand weeded	15 #	8.3	.16	11.9
	30 #	8.4	.13	11.8
Fiddleneck	15 #	0.5	12.7	0.9
	30 #	0.3	12.2	0.8
Groundsel	15 #	6.1	1.8	9.9
	30 #	6.3	1.7	11.6
Chickweed	15 #	7.5	.87	11.4
	30 #	7.5	.85	10.8
Wildoats	15 #	1.4	9.5	3.0
	30 #	0.8	9.7	1.0
Annual bluegrass	15 #	6.9	1.5	10.7
	30 #	7.5	1.3	11.7

A study conducted in San Joaquin County 1984-85 evaluated yield and cost benefit on the first cutting where weeds were controlled vs uncontrolled weedy plots. Yields were taken and prices applied to varying quality of hay. In all herbicide treatments a gross dollar increase of \$30-\$50/acre income was seen where broadleaf weeds were controlled. This study concluded that a cost benefit exists, and it would be a sound economical decision in controlling weeds in seedling alfalfa.

Yield and Gross Income of Weedy and Weed-free Alfalfa at First Cutting

<u>Treatment</u>	<u>% Weeds</u> ¹	<u>Yield Lb/A</u>	<u>Value</u>
Herbicide (6 treatment avg)	0	1088	62.57*
Weedy check	95	784	30.50**

¹wild radish and sowthistle

* based on 115/ton hay April 1985

**based on 45/ton sample grade April 1985

Summary:

A sound weed control program can pay dividends in many ways.

- Providing a good alfalfa stand.
- Prolonging the life of a stand.
- Guaranteed market by providing clean hay
- Increasing hay quality (TDN).
- Maximizing potential profit.
- Minimizing future weed populations

Herbicides should be considered a tool in the scheme of weed management. As in the use of any tool, considerations must be made on its proper use of timing, weather, weed type, and soil and crop conditions. Many failures can be attributed to man-made errors, which can be avoided with more forethought.

ALFALFA SEEDLING WEED CONTROL SURVEY

To better understand weed problems and herbicide programs used, a survey was conducted for the northern half of the state. Seventeen counties participated from San Joaquin County north to the Oregon border. University of California Farm Advisors were the source of the survey information.

Appreciation is extended to all participants for their time and effort.

The following is a summary of survey results from northern counties

ALFALFA SEEDLING SURVEY - SEPTEMBER 1986

COUNTY	ACREAGE	ANNUAL PLANTED ACREAGE	% ACREAGE USING PREPLANT HERBICIDES	% ACREAGE POST- EMERGENCE HERBICIDE	% ACREAGE USING PRE- & POST	% USING NURSE CROP	TIME OF PLANTING (%)		
							FALL	SPRING	OTHER
Alameda	870	200	6	53	55	0	80	0	20
Butte	3,000	650	10	0	0	.05	75	25	0
Del Norte	40	40	0	0	0	0	0	0	0
Glen/Colusa	25,000	6,000	40	25	40	.01	90	10	0
Humboldt	300	75	0	10	0	.90	20	80	0
Lassen	30,000	4,500	10	20	5	.30	40	30	30
Napa	500	100	0	100	0	0	0	0	0
Plumas/Sierra	7,000	100	0	0	0	.20	25	75	0
Sacramento	7,000	1,000	75	50	75	0	75	25	0
San Joaquin	50,000	10,000	30	75	20	.08	70	25	5
Shasta/Lassen	10,000	1,500	25	65	25	5	33	67	0
Siskiyou	71,000	10,000	1	5	0	.01	25	75	0
Solano	11,300	3,000	0	0	0	.20	65	30	5
Tehama	6,000	350	20	50	5	5	70	30	0
Yolo	26,000	6,000	30	30	20	0	70	30	0
TOTAL	248,160	43,515							

SEEDLING ALFALFA SURVEY
% HERBICIDES USED

COUNTY	Preplant					Postemergence				
	BALAH	EPTAM	CHEMIDE	OTHER	NONE	CHEMIDE	BUTYRAC	ORTHO	KERB	PREMERGE
Alameda	3	3	0	0	0	0	0	23	21	25
Butte	0	0	0	0	0	0	0	0	0	0
Del Norte	0	0	0	0	0	0	0	0	0	0
Glen/Colusa	0	20	0	50	30	10	0	40	0	0
Humboldt	0	0	0	0	0	0	10	0	0	0
Lassen	0	50	0	0	0	0	20	0	20	0
Napa	0	0	0	0	0	0	100	0	0	0
Plumas/Sierra	0	0	0	0	0	0	0	0	0	0
Sacramento	100	0	0	0	0	0	50	25	0	0
San Joaquin	30	10	0	0	60	0	20	30	10	30
Shasta/Lassen	0	25	0	0	75	0	2	0	3	0
Siskiyou	0	0	0	1	0	0	4	1	0	0
Solano	0	0	0	0	0	0	0	0	0	0
Tehama	0	30	0	70	0	10	10	10	0	10
Yolo	30	0	0	0	0	20	80	1	0	1

SEEDLING ALFALFA REPORT
GRASSES AND WEEDS

<u>County</u>	<u>Grasses</u>	<u>Broadleaf Weeds</u>
Alameda	yellow foxtail, watergrass	lambsquarter, sowthistle, nightshade, purslane
Butte	pigeongrass	common groundsel, mustard, shepherdspurse, minerslettuce
Del Norte	oats	tansy ragwort
Glen/Colusa	ryegrass, volunteer wheat foxtail, wildoats	chickweed, fiddleneck, black mustard, common groundsel starthistle
Humboldt	ryegrass	mustard, lambsquarter, whitecover, starthistle
Lassen	downybrome, foxtail	mustard, pigweed, plantain, shepherdspurse
Napa	foxtail, barnyardgrass, dallisgrass	common groundsel, knotweed, fiddleneck
Plumas/Sierra	annualgrass	lambsquarter, pigweed, filaree, malva
Sacramento	ryegrass, barnyardgrass	mustard
San Joaquin	ryegrass, volunteer wheat, barnyardgrass	mustard, radish, fiddleneck, minerslettuce, chickweed
Shasta/Lassen	kentucky bluegrass, squirreltail, foxtail, barley, lovegrass, witchgrass	shepherdspurse, mustard, dandelion, pigweed, lambsquarter
Siskiyou	wildoats, barnyardgrass, watergrass, bristlegrass	pigweed, filaree, knotweed, nightshade, mustard
Solano	foxtail, barnyardgrass, dallisgrass	common groundsel, knotweed, fiddleneck
Tehama	annual ryegrass, watergrass, volunteer grain, wildoats	mustard, radish, common groundsel, chickweed, burclover
Yolo	wildoats, ryegrass, annual bluegrass, wheat	common groundsel, mustard, fiddleneck, common knotweed, minerslettuce