ALFALFA PRODUCTION IN SAN JOAQUIN COUNTY

Prepared by:
Mick Canevari, U.C. Farm Advisor

Alfalfa is the queen of forages. It totals over one million acres in the state and in excess of 75,000 acres in this county. Its annual income for this county exceeded $40 million in 1979 and is sure to top that figure for 1980.

Alfalfa is grown primarily for feed for dairies or other livestock feed needs. Dairymen and livestock growers are beginning to grow more of their own hay, but the majority is still produced by commercial hay growers.

Alfalfa is utilized in several different forms: bales, cubes, pellets, silage, and some grazing.

Areas of Adaptation

A deep, well-drained, medium-textured soil is considered ideal for alfalfa. This is also true for orchards and high-cash vegetable crops. This is the problem alfalfa is facing and will continue to face.

The crop is now being grown on many types of soils previously thought to be undesirable for alfalfa. Even with the tremendous breeding progress, Phytophthora root rot and nematodes are still the major contributors to stand decrease yield reduction.

Alfalfa on heavy clay soils must have careful water management to avoid root rot difficulties, and at times, this has not been sufficient. Originally, the variety Lahonton was introduced for heavy soil root rot complex resistance. Many new varieties have branched from Lahonton to provide reasonable root rot control.

Alfalfa production on the light sandy soils in the southern part of the county faces nematode problems. Varieties with some degree of nematode tolerance do exist but are still a far cry from being the total answer.

Actually, soil fumigating in combination with nematode-tolerant varieties should be seriously considered in sandy soils. These varieties are not resistant to the total nematode complex; this is why fumigating can be so important.

Production Factors in Alfalfa

Land Preparation - Proper preparation for planting cannot be over stressed. A well-prepared seed bed, proper width and length of checks, land finish and proper percentage grade, good drainage and soil p.H. corrected if needed, are recommended. Any haste or cutting corners in planting alfalfa can lead to troubles that cannot be corrected later on resulting in a short-lived, unprofitable stand.

One popular way to accomplish these things is to plant barley or wheat the season before alfalfa is to be planted. This allows all summer for chiseling, subsoiling, and land preparation. It also has been demonstrated that winter grain is the best crop to precede alfalfa as far as irrigability of the soil and soil-borne diseases and nematode reductions. Not attending to the above will result in poorly drained areas, weed competition, and root rot hazards.

Varieties - At present, many varieties exist for all types of conditions. Alfalfas are classified by dormancy types. They are:

1. Dormant (winter dormant) - able to withstand extremely cold temperatures, mountain areas

2. Semi-dormant - adapted for the central region, Sacramento and northern San Joaquin Valley

3. Intermediate dormancy - semi-dormant in midwinter, but longer spring and fall growing season, southern Sacramento and San Joaquin Valley

4. Non-dormant - grown in southern and central California during winter months, primarily southern San Joaquin Valley

The most common types for our area are semi and intermediate dormancy types. They have the greatest Phytophthora root rot resistance. Some non-dormants are planted in the lighter soils to the south and west of here.

Refer to the variety insert ("1979 Yield Results") for yield comparisons.

Irrigation - Proper water management is the key to long-lived and productive alfalfa. Water should cover checks evenly and rapidly. Tail water must be removed from the field to avoid scald drown-out and weed problems.

Approximately eight 6-inch applications of water per irrigation are normal on good soils. However, this is modified according to soil types and subsurface structures which might interfere with water penetration. Two irrigations per cutting is the average. From 8 to 12 hours per irrigation setting is usually required to achieve the desired amount necessary. Longer than 12 hour settings on clay soils can cause drowned out and Phytophthora attacks.

Good water penetration is very important to alfalfa production. Where it is poor and cannot be increased by irrigation methods, alfalfa production is low. Heavy application of gypsum or sugar beet lime has been of some help, but it is not the solution.

Weed Control - Weeds can be a major problem in establishing and producing alfalfa. A heavy weed population will compete with alfalfa for water and nutrients, and will delay growth, reduce quality, and may even be toxic to livestock.

Several pre- and post-plant herbicides are available to do the job and should be of major consideration to all hay growers to insure clean, high-yield, and quality hay. Enclosed is one current weed control publication that describes in detail the materials, rates, timing, and types of weeds controlled.

Fertilization - Soil samples before planting may lend some information. Generally, phosphorus is the nutrient needed in the greatest amounts. Approximately 100-150 units of P/acre will satisfy the crop's needs for a couple of years.

Nitrogen is not recommended in large amounts. Usually the grasses will benefit more than the alfalfa, since alfalfa is a legume and fixes its own nitrogen. For quick seedling emergence at planting, 25 units/acre of nitrogen can be applied. K is commonly added at pre-plant time which should suffice the duration of the stand, unless unusual problems exist.

Insect Control - Resistant varieties have minimized spotted alfalfa aphid and the green pea aphid as serious pests. A new pest receiving attention now is the Blue Aphid. Varieties are now being bred for Blue Aphid resistance. Chemical control can be used if high populations develop.

Alfalfa weevil and Egyptian alfalfa weevil seem to build prior to first cutting. Depending on alfalfa growth and time, a premature cutting can eliminate the problem without chemicals. The alfalfa weevil sometimes reaches economic populations during the third or fourth cutting. Here pesticides are used for control.

Alfalfa butterfly and yellow-striped armyworm flare up in some seasons and need control. With these as well as the weevil, sometimes early cutting is better than using chemical control.

Enclosed is a "Pest Control Program for Alfalfa Hay."

Diseases - Diseases of alfalfa may be caused by fungi (molds), bacteria, viruses, mycoplasmas, nematodes, nutritional excess and deficiencies, and by such physical factors as flooding at times when extremely high temperatures prevail. The determination of which disease is caused by which organism or factor is more than an academic exercise for the researcher. It is a constant challenge for the grower, the plant breeder or anyone who wants to intelligentl attempt to control the disease.

Phytophthora Root Rot - The #1 disease to alfalfa in California causes deaths of whole stands at ends of irrigation runs or in wet fields. It is caused by a water mold--a fungus spore that swims in water. When this zoospore stops swimming, it germinates and invades the alfalfa roots. Water in excess of field capacity is necessary for fungus attack to alfalfa.

This is why the emphasis in the earlier discussion to provide good field drainage and proper irrigation techniques.

Stagonospora Crown or Root Rot becomes important in certain fields that are about 2 or 3 years old. The onset of the disease is slow, but once the plant is infected, it never recovers. No control is known.

Nematodes - Stem, bulb, and root-knot nematodes will be fast contributors to reducing stands. Alfalfa following alfalfa or in soils where native populations are high should be closely considered. Crop rotation, tolerant varieties and/or fumigation may be well worthwhile.

Many other diseases of lesser importance do exist on alfalfa, particularly foliage bacterias and fungi. These are too numerous to describe at this writing.

Growers, PCA's, seed salesmen, and chemical fieldmen should always be aware of potential problems. Choosing the right varieties, proper soil preparation, nutritional requirements, and weed control are high priority items.

Harvesting - The greatest percentage of harvesting is done on a custom basis. It is said that a 400-plus acre ranch is needed to justify ownership of all hay harvesting and moving equipment. However, this can change quickly according to wholesale hay prices.

Since alfalfa lends itself to small acreage production (10 acres), a need for custom services also begins to increase.

Marketing

It is estimated that approximately 50 percent of the county's hay is handled by a cooperative. It maintains its own sales force and moves hay directly from the farms to dairymen in the Central Valley counties. Other growers sell their hay locally by bargaining with a dairyman or dealer. The minimum acreage requirement for membership to the cooperative is 40 acres. Therefore, small lots under 40 acre in size should consider other marketing outlets prior to planting.

Much of the hay is stacked beside the field and sold later on a roadside basis. More growers now have or are constructing pole barns for storage. This may or may not be for speculation on the market. There is a need for storage for the hay that the market does not take immediately. Much of the hay may be damaged by early fall rains in years when hay is in surplus. Some hay growers pay for their barns in one season--others lose depending on the market.

The market outlook for alfalfa is influenced by several factors:

1. State acreage - Large acreage changes in the southern San Joaquin Valley are more influences than local fluctuations.

2. Outlook for other crops - Cotton, tomatoes, sugar beets, feed grains and others are diverted to or from alfalfa acreage as conditions exist.

3. State yield and production.

4. Price and supply of other feed - how priced concentrates replace alfalfa.

5. Condition of range pastures.

6. Number of dairy and beef cattle in the state.

7. Supply and cost of irrigated pasture, silage or forage crops.

1979 Yield Results

TEST V - PLANTED 1975
DORMANT - SEMI-DORMANT VARIETIES (LAHONTAN TYPES)

FOUR SEASON AVERAGE YIELD (24 CUTTINGS)

Variety	Avg. Yield tons/acre 4 seasons	Duncans Multiple Range Test	Marketed By
Pioneer Brand 581	8.9		Pioneer Hi-Bred Int., Inc.
Resistador II	8.5		Northrup, King & Co.
DeKalb Brand 167	8.2		Ramsey Seed, Inc.
Condura 73 Brand	8.2		Continental Grain
AS-49P	8.1		Ferry-Morse Seed Co.
El Camino Brand WL-318	7.9		Germain's Inc.
El Camino Brand WL-311	7.6		Germain's Inc.
U.C. 108	7.6		Experimental
Hoapa 69	7.5		All (Expt. Sta. USDA)
El Camino Brand WL-309	7.4		Germain's Inc.
Lahontan	7.2		All (Expt. Sta. USDA)
DeKalb Brand 131	6.8		Ramsey Seed, Inc.
LSD.05 =	.5		

Mean (average) yields of varieties connected by a solid line are not significantly different at the 5% level of probability.

1979 Yield Results

TEST V - PLANTED 1975
INTERMEDIATE - NON-DORMANT VARIETIES

FOUR SEASON AVERAGE YIELD (24 CUTTINGS)

Variety	Avg. Yield tons/acre 4 seasons	Duncans Multiple Range Test	Marketed By
U.C. 100	8.6	a	Experimental
AS 13-R	8.5	a b	Ferry-Morse Seed Co.
U.C. 103	8.4	a b c	Experimental
El Camino Brand WL 512	8.3	a b c d	Germain's Inc.
Pioneer Brand 572	8.3	a b c d	Pioneer Hi-Bred Int., Inc.
Isom 71 PC	8.2	a b c d e	Experimental
U.C. 76D	8.1	a b c d e	Experimental
CUF 101	8.1	a b c d e	All (Expt. Sta. USDA)
CW-8	8.1	a b c d e	Experimental
U.C. 86	8.0	b c d e	Experimental
NK K206-1 L4	7.8	b c d e f	Experimental
Germain's Eldorado R	7.8	b c d e f	Germain's Inc.
Lahontan	7.8	b c d e f	All (Expt. Sta. USDA)
El Camino Brand WL-508	7.8	b c d e f	Germain's Inc.
El Camino Brand WL-600	7.6	c d e f	Germain's Inc.
Moapa 69	7.5	d e f	All (Expt. Sta. USDA)
U.C. 93-C	7.4	e f	Experimental
Converde 95 Brand	7.3	f	Continental Grain

LSD.05 = .5

Mean (average) yield of varieties connected by a solid line are not significantly different at the 5% level of probability.