

NON ALFALFA HAY AND FORAGE OVERVIEW-- WHAT IS BEING GROWN AND WHY

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ABSTRACT

There are over 400,000 acres of annual cereals grown for hay or silage in California. By far the most important forage besides alfalfa in California is oats which are grown on over 350,000 acres throughout the state. In dairy areas, forage mixes are also very important, especially for silage. Most of the oat hay is cut in the soft dough stage and fed to either non-lactating dairy cows or to horses. Other important forages are wheat cut for silage, sudangrass (used mainly for export), and perennial grass hay in northern California.

Key Words: oats, sudangrass, grass hay, wheat hay, winter forage, forage mixes, oat hay, silage

SMALL GRAIN FORAGES

By far the most important forage besides alfalfa grown in California is oats which are grown on over 350,000 acres throughout the state. They are grown in nearly every county from the mountains to the deserts. Most of the oat crop goes to feed non-lactating dairy cows and the state's approximately one million horses. Most oats are cut in the soft dough and baled. Average price per ton for oat hay statewide was \$55-60 in 1992, \$79 in 1991 and \$61 in 1990.

San Joaquin Valley

The largest concentration of oats is in the upper San Joaquin Valley with 110,100 acres in the combined area of San Joaquin, Stanislaus and Merced Counties. There are an additional 40,000 acres of forage mixes, nearly all for silage, in this area. Most are grown on irrigatable ground and usually receive at least one irrigation, although in years of high rainfall they may receive none. There is also a relatively small acreage of winter forage or oats grown dryland on the hills mainly on the east and a little on the west side of the valley. The irrigated oats and winter forage are planted in the fall, usually following double cropped silage corn. Around Turlock a few growers plant as early as late August into preirrigated ground or sometimes the oats are irrigated up. These fields have a cutting taken off in November and are then allowed to regrow. Most of the winter forage is planted in late September to mid-December with late October to early November being the norm. Harvest begins in April and continues through mid-May. Most of the cereal forage is cut in the bloom stage in order to maximize quality, especially when used for silage. Because bloom stage winter forage is too wet to ensile properly, it is first swathed into windrows and allowed to wilt to about 70% moisture before being chopped and packed into bunker-type silage pits. Oats cut for hay are swathed in either the bloom or soft dough stage. Most of the winter forage, which includes oats, forage wheat and forage mixes, is used on dairies where it is fed primarily to dry stock and some milking cows.

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In San Joaquin County, most of the winter forage crop is cut for silage except in the delta and Tracy area, which is almost exclusively cut for hay. Stanislaus County cuts about half for hay and half for silage, while in Merced County there seems to be more silage than hay.

For plantings of straight oats for hay, Kanota is the preferred variety in Stanislaus and Merced Counties because of its fine stems and adaptation to the sandy soils of the region. Swan oats are also popular but are used more for silage and in forage mixes. Montezuma is the preferred oat in San Joaquin County.

In the past few years, Dirkwin wheat has become popular in this area as both hay and silage for both dairy use and some horse hay. This beardless wheat makes an exceptionally fine stemmed and palatable hay when cut prior to the flower stage, and yields are commonly much better than for oats. There were over 8,000 acres planted to Dirkwin wheat in the Northern San Joaquin Valley last season.

The acreage of oats grown tapers off in the middle of the San Joaquin Valley, and only about 2,500 acres of oat hay is grown in Madera County, virtually all of which is cut in the soft dough stage and fed to horses. An additional 2,000 acres of mainly winter forage mix is grown for silage on dairies.

In Kings County, a large dairy industry grows about 13,000 acres of cereal silage of which about 70% is wheat, 20% is barley and the remainder forage mix or oats. Varieties of wheat and barley grown for silage are the same as those normally grown for grain, with Yecora Rojo being the most prevalent wheat variety. Harvest is in the soft dough stage. Dairy nutritionists there feel that wheat silage quality is good enough that it can be substituted in the milk cow ration for corn silage. The crop is planted between November 15 and mid-December, usually in rotation with corn silage or cotton. In addition to the cereal silage, there are about 1,200 acres of mostly oat hay and a little green chop.

Trends for Fresno County dairy areas are similar to those of Kings except that there are more forage mixes grown in addition to the wheat, and some of the wheat grown is a beardless forage wheat grown for silage. Traditionally silage in this area has been cut in the soft dough stage but a few dairy operators are starting to cut as early as boot stage. A few thousand acres of oats are grown for horses and some dairy use. Total cereal silage and hay acreage is probably just over 10,000 acres.

Tulare County has a total of 70,000 acres of winter forage. About half of this is oats, and the remainder is wheat, barley and forage mixes. The trend to use bearded wheats and barleys for silage is less in Tulare than in Kings County, even though they are otherwise very similar areas. More than half of the total crop (39,000 acres) is cut for silage. Almost all is used for dry cow hay or silage. Most of the total crop is irrigated, but there is also a sizable acreage on the east of the valley of dryland oats grown mainly for horse hay. The preferred variety for either irrigated or dryland oats is Montezuma, Kanota being a distant second. Some Ramona, an older, beardless wheat variety, is grown dryland for hay. Nearly all cereal hay or silage is cut in the soft dough stage.

In Kern County data is sketchy but there appears to be less than 15,000 acres of all hay and silage. About one quarter of this is winter forage mix used for silage on dairies. Many dairies in this area do not plant a winter forage crop, opting instead to idle the ground or grow a second corn silage

crop in the same season. Some oats are grown for hay and shipped to a southern California market. Virtually all is irrigated.

Sacramento Valley

In the lower Sacramento Valley (Yolo, Solano, Sacramento, and Sutter Counties) there are about 23,000 acres of oats. Nearly half of these are in Yolo County. Approximately 90% of the oats in Yolo and Solano Counties are grown dryland on the gentler slopes of the hills on the west side of Yolo County and on the Montezuma hills in southern Solano County. Average yields of dryland oats are under two tons per acre. If oats are grown on the irrigated ground, it is mainly because the ground needs a cereal rotation crop and/or a farm may not have sufficient allotment to plant wheat or barley. The situation is similar in Sacramento and Sutter Counties which each have about 4,000 acres of oats. Nearly all the oats in these areas are grown for hay, cut mainly in the soft dough stage (a few fields are cut in the flower) and marketed primarily for horses. The main varieties are Montezuma and Cal Red. Very occasionally a forage mix is grown.

In the northern and central Sacramento Valley, oats and other winter forages are not extensively grown, even in the dairy areas, where growers may produce some corn silage or alfalfa, but will usually purchase oat hay. There are a few thousand acres of mainly dryland oat hay grown in most of the counties.

The Sacramento Valley area grows over 250,000 acres of wheat for grain, and occasionally a weedy or otherwise damaged field is cut for hay. In some years, large acreages of wheat are cut for hay in order to comply with requirements of government wheat programs.

Coastal Counties

Sonoma and Marin Counties have nearly 38,000 acres of oats. Although there is a large dairy industry nearby, this area is too cool in summer to grow good alfalfa. There are vast acreages of oat hay grown on the northern fringes of San Pablo and Suisun Bay, most notably on Mare and Skaggs Islands, in the vicinity of highway 37 (some of this acreage is technically in Solano County) and around Petaluma in the dairy area there. The bulk of the crop is grown dryland on level ground. Most is cut in the soft dough stage for hay and is fed to dairy, horses and some sheep. The overwhelming majority is Cal Red with a very small acreage of Kanota or Cayuse. Occasionally the oats will be blended with ryegrass to make very fine stemmed horse hay. In the dairy area, there is more pasture and single crop silage corn fed, and the oats that are grown are more often cut for hay than for silage. Sometimes the oats are blended with vetch or bell beans. A few dairymen grow wheat for silage. Except in the dairy area, irrigated land is seldom used for cereal hay. In the westside hills, there are large acreages of dryland oat hay, but the crop is poorer than on the flat ground. All oats in this area are planted around November and most are harvested in the soft dough stage.

There are just over 10,000 acres of oats in Monterey and San Benito Counties. All is grown dryland and is cut in the soft dough stage and used for hay for horses. Occasionally an oat silage cover crop is grown for rotational purposes on vegetable ground. Other Bay Area counties have minimal (<3,000 acres) cereal hay acreages. In general, very few oats are grown right along the coast; most substantial acreages are somewhat inland.

San Luis Obispo County has over 25,000 acres of grain hay. Over half of this is oats sold mostly to the horse market and some cattle. If it is being sold, it will usually be cut in the soft to hard dough stage, however, a few may cut in the milk if it is to be used for the grower's own horses or cattle. Since there are currently only a couple of active dairies in the area, greenchop and silage acreage is very small. All is grown dryland except for the rare alfalfa farm.

The remainder of the cereal hay acreage is barley and a little wheat that is cut for hay due to crop failure, usually freezing injury to the heads. The acreage of wheat or barley hay consequently varies and it is difficult to predict which particular fields will be damaged from year to year, but there has never been a time when at least some of the grain crop has not been cut for hay. Although the low areas are hardest hit by frost, most growers find it easier to plant the whole field at once, although, if time and weather permit, some will plant the higher ground first and then come back later to plant the lower ground in December.

Because growers anticipate that at least some portion of the crop will need to be cut for hay, semi-smooth or smooth awned grain varieties such as Prato, UC 337, UC 476 and Arivat are preferred. All grains are planted in the fall, but unlike most areas, the oats are planted in from December through mid-February, after the wheat and barley. Barley hay is cut by mid-May, and oats are cut later in the spring.

Virtually all of the grain farms are also livestock operations so most barley and wheat hay is used on the grower's own ranch.

Santa Barbara County has about 8,000 acres of cereal forages, about 90% is grown dryland on rolling hills, and 10% is sprinkler irrigated greenchop or silage used on the few remaining dairies. Silage varieties include oats, forage mixes and some triticale. Most of the oats are cut in the soft dough for horse hay. Some hay is made from wheat or barley grain fields if there was a crop failure. This is fed mainly to rangeland cattle.

Southern California

Most southern California counties have minor acreages of oats, usually less than a few thousand acres. These acreages are generally scattered smaller fields throughout the entire region, and it is difficult to make generalizations other than to say that they are usually dryland and are fed to horses. Some are associated with dairies, although dairies in this region tend to import most of their feed. Imperial and Riverside Counties which have substantial wheat acreages will have an occasional field fail and be cut for hay.

At one time there were over 5,000 acres of oat hay in Imperial Valley, which was planted in November. It is possible that acreage will again increase if growers can take advantage of established connections to supply the Japanese export market with oat hay as well as sudan.

Intermountain

Oat hay has become less popular as a crop in the northern mountain counties because in some years the oats grown in the northern bay and Sacramento Valley areas saturate the market, causing prices to fluctuate too much. There is less than about 10,000 acres of oats grown in the four county area of Siskiyou, Shasta, Lassen and Modoc Counties. Nearly all the oats grown on

irrigatable ground are grown as a rotation crop on land normally in alfalfa or other crops. In addition to the oats, Yamhill wheat, an awnless, late maturing winter variety is a popular forage which is used either on farm or sold. It is often grown mixed with Austrian winter peas and a yield of 4 to 5 tons is not unusual.

The oats are usually planted in the spring around April, or in the fall in September-October, depending on the area. The winter wheat is planted in the fall around October. Both are cut in July, usually in the soft dough stage. Because of the warm days and cool nights, the oats will sometimes regrow and additional cuttings may be made. The total yield for all cuttings of oats can be as high as 8 tons per acre, which rivals that of alfalfa. Popular oat varieties are Park and Cayuse.

A small acreage of either Yamhill wheat or cereal rye is planted dryland in September following a fallow year.

None of the other mountain counties of the western and eastern Sierra Nevada have significant amounts of cereal hay. All are around 1000 acres or less in small, scattered patches. Where the winters are severe, oats, forage wheat or barley, or possibly forage mix is planted in late February or early March for a mid-summer harvest.

PASTURE AND PERENNIAL GRASS HAY

There are about 120,000 acres of cropland in the intermountain region of northern California (Siskiyou, Modoc, Lassen and eastern Shasta counties). Over 100,000 acres of this is in perennial non-alfalfa forages or irrigated pasture cut for hay. There is a small additional amount in other parts of the state, especially in the Sacramento Valley, and isolated fields in the western and eastern Sierra Nevada. Almost none of this hay goes into dairy channels, but rather is fed to beef cattle or horses. Much is used locally to feed livestock over the winter. Producers also take every opportunity they can to export their product to the Pacific Rim market. Many growers in the intermountain region have found perennial pasture to be a more versatile crop than alfalfa because it can be cut for hay, grazed, or both. Returns can be good as the mountain regions often get as much for grass hay as for alfalfa, and well cured timothy hay brings a premium price in the racetrack and export market.

Commonly used species include tall fescue, orchardgrasses, timothy, reed canarygrass, red clover and other legumes. One to two hay cuttings are taken off the pasture depending on the region, and often cattle returning from the range are allowed to graze the aftermath, or regrowth following the hay cuttings. Sometimes old alfalfa fields are interplanted with oats in the spring for a final early summer harvest, or cool season grasses such as timothy or orchardgrass are seeded directly into the stubble.

The Imperial Valley also grows grass hay. Last year there were a few thousand acres of ryegrass baled for export. There were also several hundred acres of brome grass, and a little Matua grass. Klein grass (*panicum coloratum*) is an experimental perennial from Africa that in its first year produced 5 tons/acre and in its second year produced 14 tons/acre from four cuttings. The hay produced was of exceptional quality with a crude protein of 17% and an ADF (acid detergent fiber) of 29%.

This region has 17,000 acres of Bermuda grass grown on very salty ground for seed production. After the seed has been harvested, the regrowth is cut and baled. About 80,000 tons per year of this relatively poor quality hay are fed to livestock in local feedlots.

SUDANGRASS

The bulk of the state's sudangrass crop is grown in the Imperial Valley, where as much as 80,000 acres are grown mainly for export to Japan. The crop is planted in late February or in March as soon as the ground temperature warms to 65°F. The first cutting is taken in May, the second in late June. Each of these produce about 2-1/2 tons per acre. After these two cuttings, the regrowth becomes too coarse for the export market and the third cutting is used for feed yards, horses, dry cows, sheep or is plowed down. The Japanese market especially likes the light green color of the sudan produced in the Imperial Valley over that produced in the San Joaquin Valley.

There is additional acreage in the lower San Joaquin Valley which is grown for export. The rest of the sudan grown in the state is scattered in nearly every region. Nearly every dairy area has a small percentage of dairies which use sudan for hay or greenchop, and there are a few fields in nearly every other irrigated area used for horses or beef cows.

Small Grain Silage and Hay Acreages for California 1992

| <u>County/Area</u> | <u>Silage</u> | <u>Hay</u> | <u>Total</u> | <u>Comments</u> |
|---|---------------|------------|--------------|---|
| Tulare | 39,300 | 30,000 | 69,300 | mainly for dairy |
| Merced | 35,000 | 25,100 | 60,000 | mainly for dairy |
| Stanislaus | 30,000 | 24,900 | 54,900 | mainly for dairy |
| Sonoma/Marin | | | 36,300 | horse & dairy oat hay |
| San Joaquin | 24,100 | 8,300 | 32,400 | dairy, some horses |
| San Luis Obispo | | 26,400 | 26,400 | horses, beef |
| Kings | 13,000 | 1,200 | 14,200 | dairy |
| Yolo | | | 10,600 | |
| Coastal | | | 32,800 | horses, beef, dairy |
| <i>(Mendocino, Alameda, Contra Costa, Lake, Monterey, Napa, San Benito, San Mateo, Santa Clara, Santa Cruz)</i> | | | | |
| Sacramento Valley | | | 29,400 | |
| <i>(Butte, Colusa, Glenn, Sacramento, Sutter, Tehama, Yuba)</i> | | | | |
| Central San Joaquin | 6,000 | 13,500 | 19,500 | |
| <i>(Madera, Fresno, Kern)</i> | | | | |
| Southern California | | | 18,000 | |
| <i>(Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, Ventura)</i> | | | | |
| Intermountain | | 15,000 | 15,000 | does not include perennial grass hay |
| <i>(Shasta, Lassen, Modoc, Siskiyou)</i> | | | | |
| Sierra Nevada | | | 9500 | |
| <i>(Alpine, Amador, Calaveras, El Dorado, Inyo, Mariposa, Mono, Nevada, Placer, Sierra, Tuolumne)</i> | | | | |
| Total | | | 428,300 | underestimates forage mixes and some wheat & barley hay |

Data used in this report was compiled mainly from the California Field Crops Statistics 1983-92 report, using 1992 figures. The hay and silage estimates were made by subtracting the total acres harvested for grain figures for each county from the total acres planted. The California Agricultural Statistics Service tabulates these numbers from annual surveys sent to most growers in the state, to which one third to one half of the growers respond. An important consideration when using these numbers is that the Ag Statistics Service specifically excludes any forage mixtures from its reporting, so it is possible that these acreages are underestimated. Additional detailed information was obtained from county crop reports, farm advisors, hay brokers, seed dealers, and the hay market news service. Our sincere thanks to the many people who contributed information for this report.