MARKETING ALFALFA IN THE 1990s

L.J. (Bees) Butler[1]

Abstract: With the exception of last years drought, average prices and regional production have remained relatively stable over the last few years. Dwindling stocks in late 1988 and early 1989 together with decreased acreage and production in 1989 have resulted in a decline in the total regional supply of alfalfa in 1989. This has forced prices up to levels not seen since 1979/80. Production of alfalfa should increase in 1990 and prices will decline somewhat, but not necessarily to levels experienced in 1986 and 1987.

In the longer term, the California alfalfa market will be influenced mainly by the fortunes or otherwise of the California dairy industry, and by the outcome of current debates leading to the 1990 Farm Bill. While there is a possibility of tighter supply restrictions on the dairy industry after 1990, the effects will be minimal for western alfalfa producers.

Keywords: Western Region alfalfa production, California alfalfa markets and production, California dairy industry, 1990 Farm Bill, Supply, demand, stocks, drought.

INTRODUCTION

With the exception of last year's devastating drought, average annual alfalfa prices have remained relatively stable over the past few years. Last year's drought, which devastated the Midwest, created a situation of extreme shortages in hay and coarse grain feeds, driving the price for alfalfa all over the U.S., including the western states, to levels not seen since 1979 and 1980.

Droughts of the type and magnitude experienced last year are unpredictable and test the managerial abilities of those who both buy and sell animal feeds. The Midwest is still feeling the effects of the drought of 1988 with poor quality hay forcing dairy producers in the Midwest to forego some productivity in milk production per cow. But alfalfa production is not based on short term phenomena - at least not in terms of short term response. Alfalfa is usually grown for periods of 3-6 years, and its production is a long term decision based on long term profitability. Few rational producers plan on a drought to increase prices for the purpose of increasing profitability. On the other hand, the relative short term profitability of alfalfa could influence some producers to increase production of alfalfa in the hopes that it will result in long term profitability. In order to understand the phenomena that drive alfalfa supply, demand and prices, it is necessary to examine both the long term and short term forces that ultimately determine the relative profitability of alfalfa.

This paper will briefly examine the trends of the last 10 years leading up to last year's drought and the implications for 1989 production. After a brief examination of the immediate outlook for alfalfa for 1990, a more detailed look at the longer term outlook for marketing alfalfa in the 1990s is presented.

OVERVIEW OF ALFALFA PRODUCTION TRENDS

Transportation costs limit the California market to a seven state region which includes California, Nevada, Arizona, Utah, Oregon, Washington, and Idaho. Both January and May stocks for the past few years have been relatively large, averaging between 9 and 13 percent of the total U.S January stocks and 5 to 10 percent of U.S. May stocks. January 1, 1988 stocks were over 13 million tons, the highest since 1982. May 1, 1988 stocks were about 2.7 million tons, below 1987 May 1 stocks but quite a bit higher than average. California stocks at May 1, 1988 were at 360,000 tons which was about average for the previous few years, but lower than stocks prior to 1982. California has tended to have lower stocks since 1982 due to low grain prices and large regional stocks affecting the need for higher stocks. Thus, when the drought began to build in late summer of 1988, California was in a reasonable but not excellent position. As the drought took hold, regional stocks dwindled rapidly. January 1, 1989 stocks stood at just over 11 million tons, the lowest since 1986. Prices soared as demand for hay and other feeds increased in anticipation of a lean spring. By May 1, 1989 regional stocks had dwindled to about 1.3 million tons, the lowest in the last 10 years. Total U.S. stocks had dropped to about 17.6 million tons, about 30 to 45 percent less than normal. California stocks had dropped to 173,000 tons which is about 50 percent of normal and about 30 percent of what they should be.

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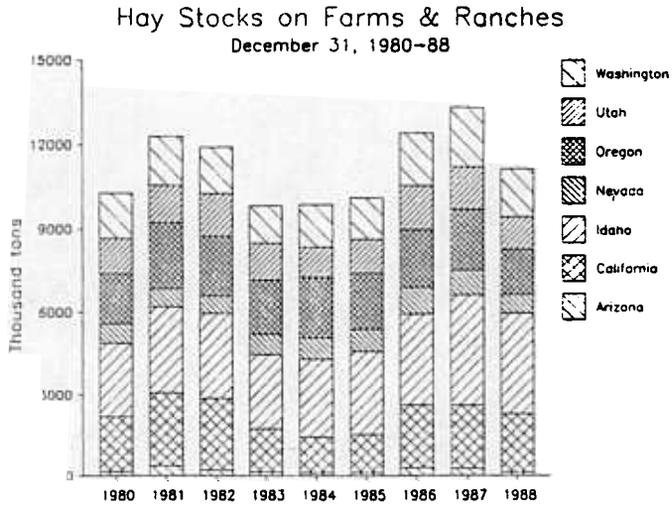
Regional Acreage and Average Yields

Government programs in the late 1970s and early 80s have encouraged expansion of forage acreage. Regional alfalfa acreage peaked in 1986 at almost 4 million acres, but has dropped off slowly in the last 3 years. Regional harvested acreage is estimated to be about 3.7 million acres in 1989. Most of the acreage cutback has occurred in California and Idaho with some slight increases in Nevada and Utah.

In addition, regional average yields have decreased since 1986 with a major decrease in Idaho this year. California has managed to retain an average yield of about 6.6 tons per acre this year although some late summer rain may cause this figure to decrease slightly.

Figure 1.



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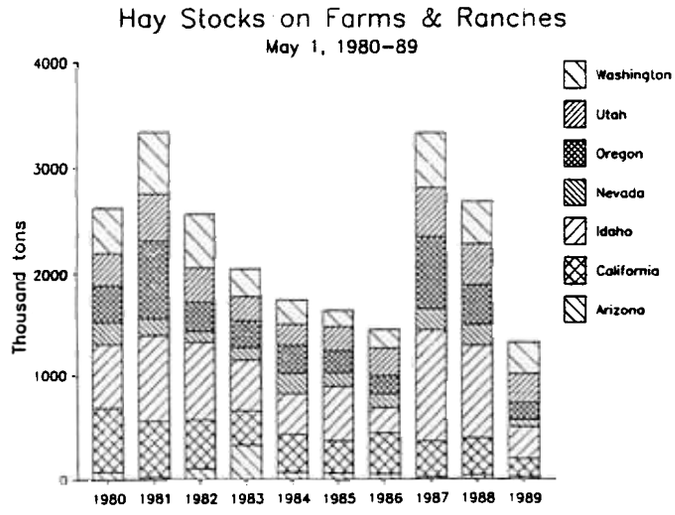
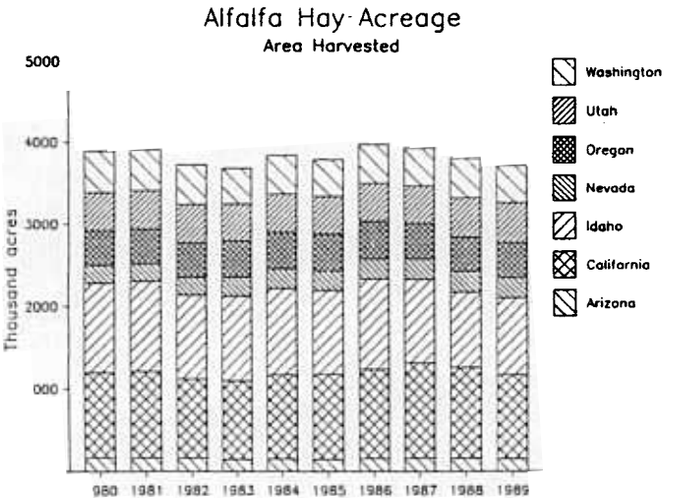


Last year, regional production of alfalfa fell 5.3 percent from 19.7 million tons to 18.7 million tons. This year, total regional production is expected to decline another 3 percent to about 18.1 million tons, bringing total regional supplies down to just 19.4 million tons, a whopping 10 percent lower than last year. This situation is the result of low May 1 stocks and reductions in acreage and yield. Total production and supplies are also down in California for the second straight year. Arizona-California production in 1989 will be about 7.9 million tons and, combined with the low May 1 stocks in both states, will result in a low 8.1 million ton total supply - down 712 thousand tons from last year and the lowest since 1985.

Figure 3.



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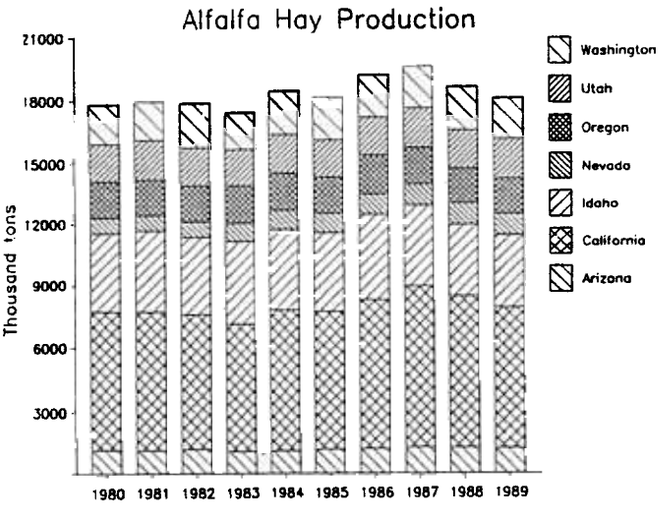
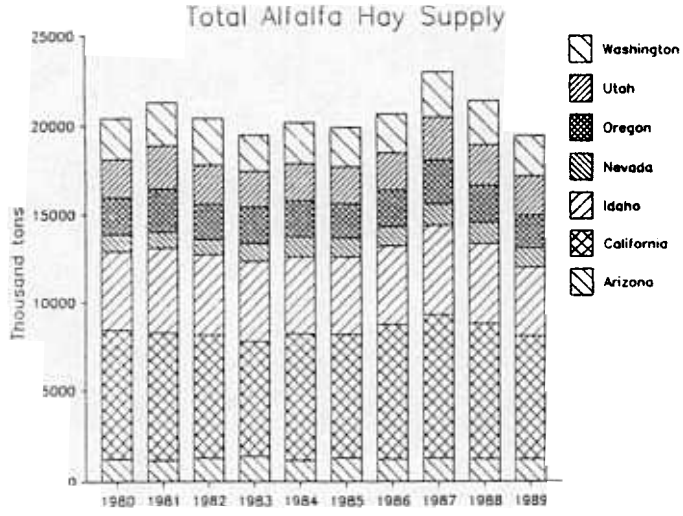


California Supply

California growers will harvest about 1.02 million acres of alfalfa and about 730 thousand acres of other hay this year. Other hay is up somewhat from previous years and brings the total hay crop harvest to 1.75 million acres, up about 4 percent from last year.

Combining acreage, yield, and stocks information the overall perspective for 1989 is a total hay supply of 8.66 million tons, down about 355 thousand tons or 3.9 percent from last year.

Figure 5.



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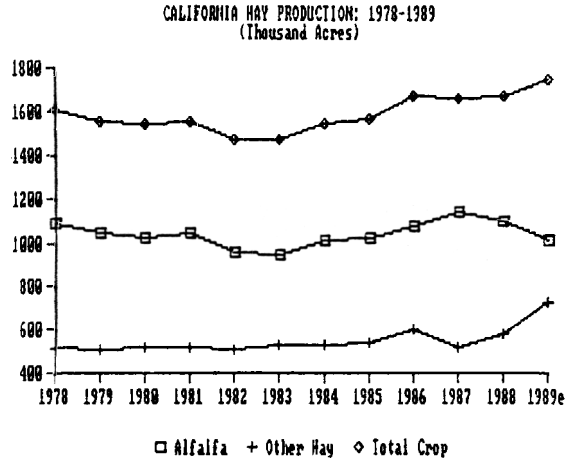

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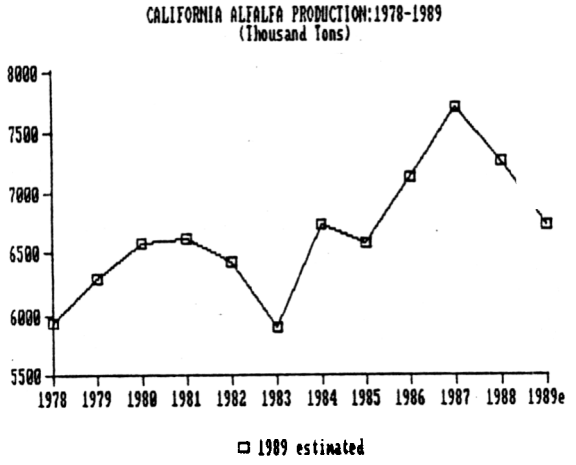
Figure 8.



Demand

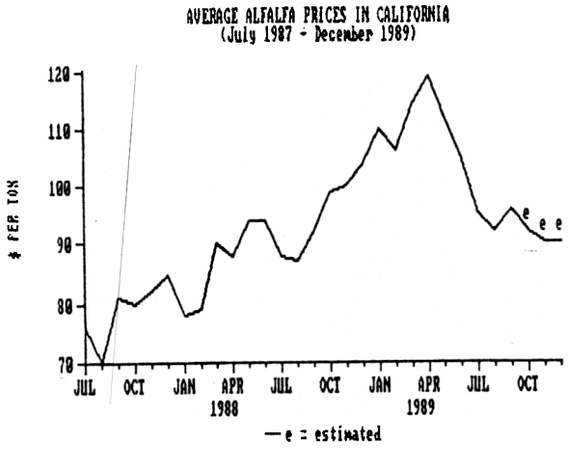
Approximately 70% of the total production of alfalfa in California goes for dairy feed. Hence, economic conditions that affect the dairy industry also significantly affects the demand for alfalfa. The other 30 percent of alfalfa grown in California is used to feed beef cattle and horses. Thus, demand for alfalfa is a derived demand for animal products. As demand for meat and milk changes, the number of dairy and beef cattle changes, thus directly affecting the demand for alfalfa.

Alfalfa competes in the animal feed market with other animal feeds such as corn, oats, wheat, barley, and cottonseed, as well as a variety of other dairy feeds that are the by-product of the fruit, nut, and vegetable industries in California. Although alfalfa is a most important component of dairy cattle diets, use in rations is significantly determined by its price relative to other (competing) feeds.

In California, the dairy industry has benefited from the Federal price support program and an innovative state marketing order that has kept California milk producers very competitive relative to other dairy producing areas of the U.S. Over the past 10 years, the dairy industry has continuously expanded in terms of cow numbers and milk production per cow. Since 1980, milk cow numbers in California have increased by over 15% while milk production has increased over 40% in the same period. (See Table 11 Appendix). Average prices paid to California producers have declined from their 1981 high of $13.44 per cwt. to a low in 1988 of $10.96 per cwt. However, 1989 prices have skyrocketed and will probably average close to $12.36 per cwt, the highest since 1984. Increased milk prices in 1989 have been due mainly to large increases in demand for non fat dry milk powder on international markets and large increases demand for cheese on domestic markets. This timely increase in prices has permitted dairy producers the luxury of maintaining their demand for alfalfa, thus keeping alfalfa prices relatively buoyant.

Milk production in 1990 is likely to continue to expand both through increases in cow numbers and from increased productivity per cow. Milk prices in 1990 will likely decline from their current high levels. Some economists feel that 1990 averages may be below 1988 levels for the U.S. as a whole. However for alfalfa producers, continued strong demand for alfalfa is expected, and may keep alfalfa prices relatively buoyant.

Figure 9.



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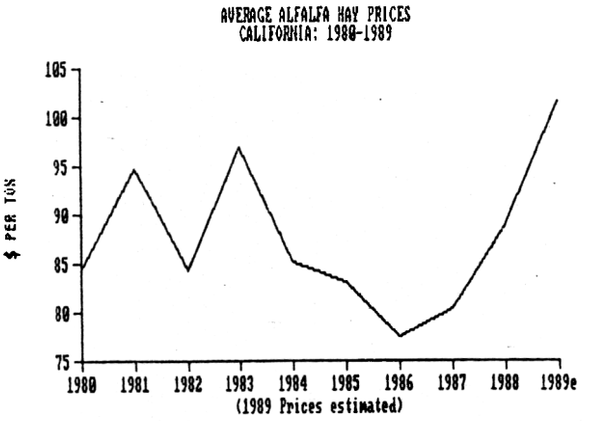

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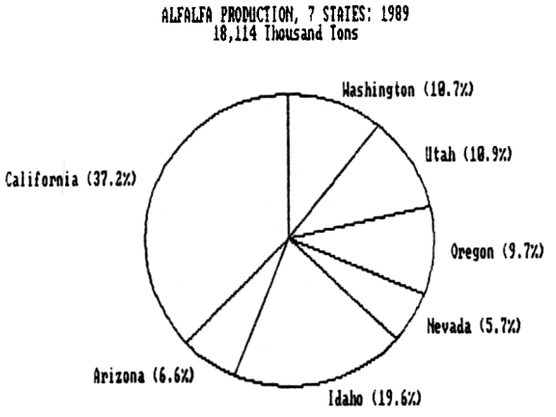

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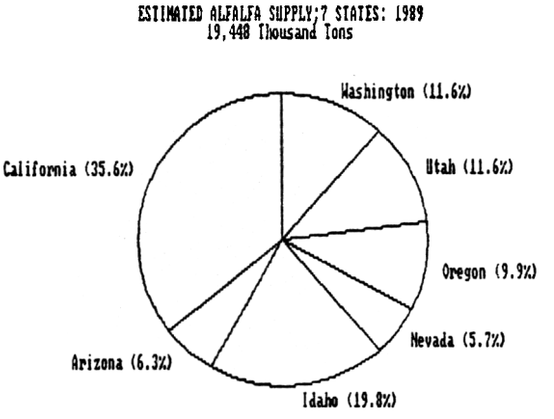


LONGER TERM TRENDS IN THE SUPPLY AND DEMAND FOR ALFALFA

Marketing alfalfa in the 1990s will be importantly determined by the fortunes or otherwise of the dairy industry, and to a lesser extend by the beef and horse industries. The short-term outlook for the dairy industry, alluded to in the previous section, indicates that the California dairy industry will continue to expand in 1990. However, that expansion is predicated on the continued existence of policies that have, in the past, been responsible for its expansion.

Demand for Alfalfa

During the next year, Congress will debate and write a new farm bill. The dairy provisions of the farm bill include specifications for the price support program, federal milk marketing orders and other special provisions. Currently, there is not a draft of the farm bill. However, there is more than usual talk amongst policy makers of including a supply management provision in the farm bill in an attempt to control milk production and prevent large surpluses from occurring. The form that a supply management provision would take is not currently known. Much interest has been expressed in a two-tier pricing scheme, either temporary or permanent, under which producers would be paid a lower price or even taxed in the event that a certain quota is exceeded. Much of the debate on such a scheme would focus on the implementation of quotas. While the details of the debate are not important here, it is important to understand that a two-tier pricing system would entail quotas of some sort, and they in turn may affect the expansion of the dairy industry. That does not mean that the California dairy industry would decline, but its current growth rates of 4-6 percent per year would be curtailed under such a policy.

The whole scenario is complicated by the expected commercial availability in the near future of bovine somatotropin (BST). BST is a hormone, normally found in a dairy cattle, that when injected can cause the cow to produce 15-20 percent more milk. Of course, the cow needs more feed to maintain a positive energy balance, but feed conversion is much more efficient. It has been estimated that for every 10 percent increase in milk production, feed costs will increase about 6 percent. The implications of BST for alfalfa producers is that it is unlikely that dairy producers will be unable to curb increased milk production. That is, they will not cut back on herd size while using BST. Therefore, the only path left for Congress is to implement a scheme that will enable the Secretary of Agriculture to act quickly if surpluses begin to exceed acceptable levels. The resulting policy may limit dairy industry expansion.

With this possibility in mind, an examination of the longer term outlook for alfalfa has to be qualified by the possibility that the current expansion of the dairy industry in California, as we currently know it, may be curtailed and, therefore, may have direct implications for the demand for alfalfa.

The demand for alfalfa is also importantly influenced by the price of alternative or substitute feeds, which in turn are often influenced by government policy, particularly through the farm bill. Wheat, corn, barley, cotton, and oats are all substitute dairy feeds that are also included in various commodity provisions under the farm bill. At this time, there is little indication that policies surrounding these commodities will seriously impact the demand for alfalfa. In fact, policies may well tend to curtail the excessive supply of these commodities, thus driving their prices up and putting alfalfa into a relatively positive competitive position. Finally, it would appear that the demand for beef, having sustained a relatively significant decline, is now turning around. While the price of beef is tempered to a large degree by its major competitors, dairy products and poultry, the quantity demanded may begin to increase significantly. If this occurs, than demand for alfalfa would likely increase. The down side of the beef demand issue is that California beef production has fallen in the past few years, and it is unlikely that California beef producers will increase production unless the price of beef increases significantly.

Supply of Alfalfa

The market for alfalfa is relatively uninhibited in comparison to other commodity markets, by government programs, marketing orders, etc. There are no restrictions to growing alfalfa or on exit from the industry and no large market superstructure. In short, the California alfalfa market operates as close to conditions of perfect competition as are likely to be observed. As such, the market is driven mainly by strong demand factors such as conditions in the dairy industry and the price of other competing feeds. However, supply response to changes in demand is relatively inelastic - that is, unresponsive. This is because alfalfa producers, when planning to plant alfalfa, figure to be in the market for several years - since alfalfa is perennial - and, therefore, do not respond to annual fluctuations in price. In addition, dairy producers who grow alfalfa do so for reasons of maintaining a stable feed supply rather than for profit. (It is estimated that about 20 percent of alfalfa grain in California is grown by dairy farmers.) On the other hand, alfalfa producers do have a short term supply response. Since there is an inverse relationship between the number of cuttings per year and the total life of the stand, producers can decide to take the risk of maximizing income in one year of relatively high prices at the expense of the total life of the stand.

In addition, there is also an inverse relationship between the quality of alfalfa hay and tonnage per cutting and length of time between cuttings. While at times this is often a constraint to absolute maximization of income in a single year, it does give producers the opportunity to vary the quality of hay depending on relative prices. More often than not, however, the markets are relatively tight and there is little margin for variation in quality for "arbitrage" between the markets. This is probably due to the use of ration maximizing programs by dairy producers.

Since alfalfa is grown on land that is suitable for a variety of crops, then short term decisions may also be influenced by conditions or prices in other crops. Competing field crops include tomatoes, cotton, corn, wheat, rice, and sugarbeets. Tree crops and grapes can also be grown on the same land, although substitution of these crops is a much longer term decision.

Thus, there appears to be both a long term and a short term response. Long term response is reflected in planted acreage and is dependent upon the profit from alfalfa, the profit from competing crops, and a combination of other factors such as alfalfa's beneficial inclusion in crop rotations and indirect effects of government programs on competing crops.

Since acreage is largely determined in the long run, response in the short run is limited to factors that affect yield. As explained above, decisions to maximize income in the short run can affect yield in any particular year. In addition, spring and fall weather conditions can influence the number of cuttings and the relative quality of the hay. For example, rain during the spring, or rain early in the fall, can ruin hay curing in the fields and significantly affect average annual yield.

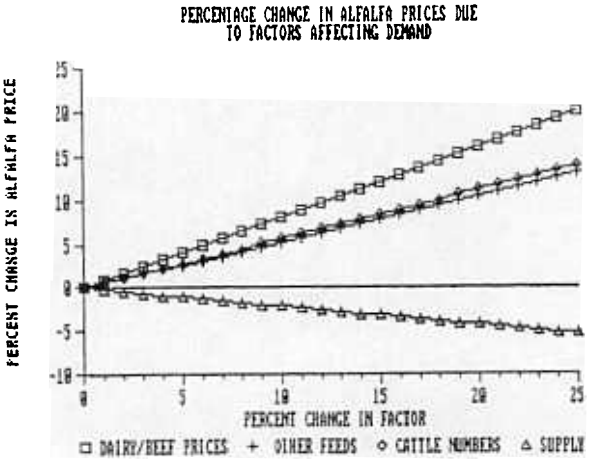
FACTOR'S INFLUENCING THE CALIFORNIA ALFALFA MARKET

The factors determining long run and short run supply and demand for alfalfa have been modelled by Meadows (1988). In the following analysis, the relative importance of each of the factors affecting the demand, and supply of alfalfa in California are examined in graphical form. This should give some clues to the relative direction and magnitude of the impacts of these factors on the markets for alfalfa in California.

Demand:

In Meadows model, changes in the demand for alfalfa are reflected in the percentage change in price of alfalfa due to changes in dairy and beef prices, the price of other feeds, the number of dairy and beef cattle and the supply of alfalfa. The first 3 factors have a positive effect on alfalfa prices while increases in the total quantity of alfalfa have a negative impact on price. These impacts are presented in Figure 13. Notice that alfalfa prices increase considerably with increases in dairy and beef prices, and to a lesser extent with increases in other feeds and in cattle numbers. The unresponsive decrease in alfalfa prices as the total supply of alfalfa increases reflects the relatively stable market due to the inability of producers to react in the short term.

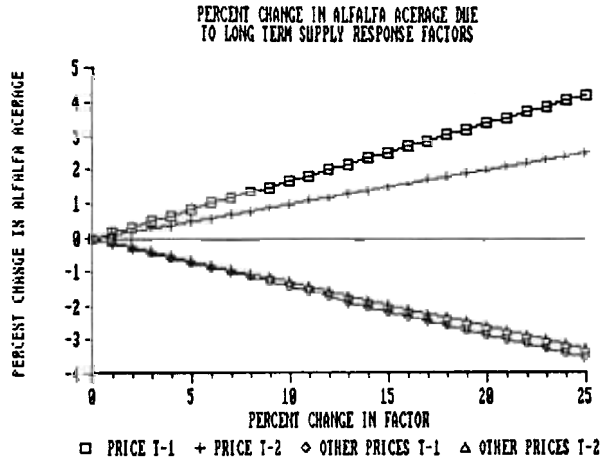
Figure 13.



Long Term Supply

Changes in long term supply are reflected in the total acreage planted to alfalfa. Changes in acreage over the longer term are mainly due to the profitability of alfalfa relative to other (competing) enterprises such as tomatoes, cotton, corn, wheat, rice and sugarbeets. These relationships are presented in Figure 14. As the price of alfalfa relative to other crops increases, the alfalfa acreage tends to increase. However, increases in the prices of other competing crops will tend to reduce the acreage of alfalfa.

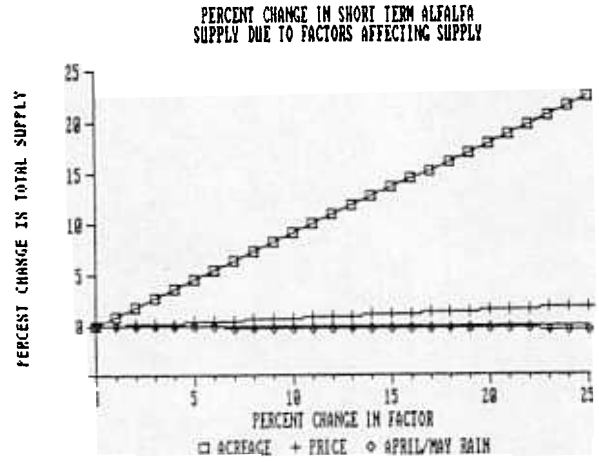
Figure 14



Short Term Supply

Changes in the short term supply of alfalfa are dependent mainly on acreage and yield. Since acreage is determined in the longer term, response in the short run is limited to factors that affect yield. On the other hand, if alfalfa producers did affect acreage in the short term - by ploughing it under or through lack of disease control, - then this would have an important impact on total supply as shown in Figure 15. The relative impact of prices and of early rain are not nearly as dramatic as changes in acreage in the short term. This is because supply is relatively fixed in the short term, and this is what keeps prices relatively stable.

Figure 15.



Equilibrium Quantities Produced and Prices

When all the factors that are assumed to affect the supply of and demand for alfalfa are taken into account, the equilibrium quantities produced and prices can be estimated.

In Figure 16, long term factors influencing the quantity produced reflect a very similar picture to Figure 14. This is because these factors influence total acreage planted since there is almost a 1:1 response between acreage and total supplies. Short term factors are much less dramatic as would be expected. In Figure 17, the greatest response in alfalfa production is given by changes in dairy and beef prices. However, even a 10 percent increase in dairy/beef prices will result in only about 1/2 percent increases in alfalfa production. Smaller responses as shown for changes in other feeds and in total cattle numbers. Changes in inventory have barely any affect on alfalfa production, and early rains have a slight negative effect as would be expected.

Figure 16.

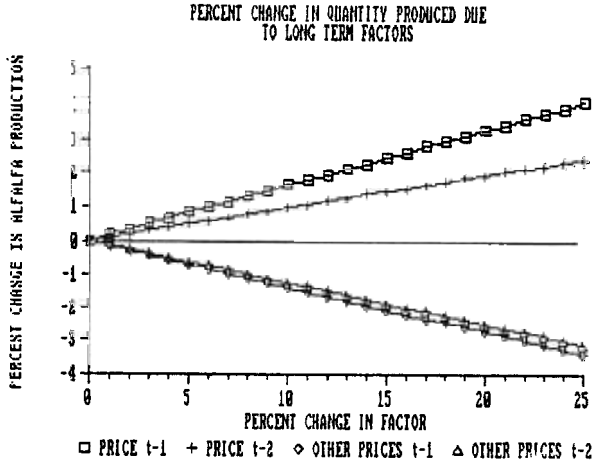
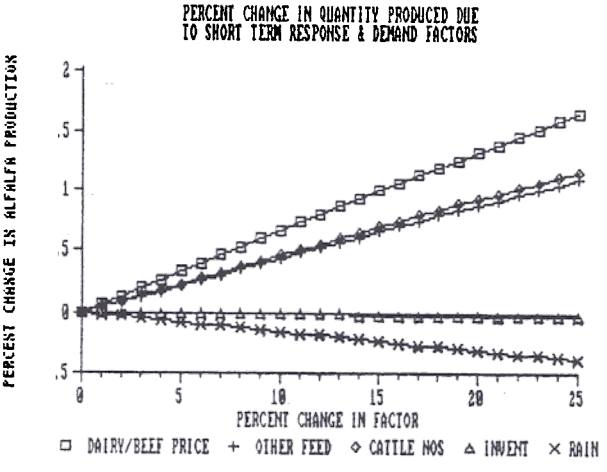


Figure 17.



Changes in equilibrium prices are quite different. In figure 18, notice that increases in long term alfalfa prices relative to other competing crop prices have a negative impact on current alfalfa prices. However, the overall effect is quite small. A 10 percent increase in lagged alfalfa prices relative to other crops will cause a relatively small decrease in current alfalfa prices. This again reflects the relative long term stability of alfalfa. Short term supply and demand factors have a more pronounced effect on alfalfa prices. In Figure 19, changes in equilibrium alfalfa prices due to demand effects of dairy/beef prices, the prices of other competing dairy feeds and total cattle numbers show a similar response to that seen in Figure 15. However, in contrast, changes in inventory and early rains show almost no impact on prices.

Figure 18.

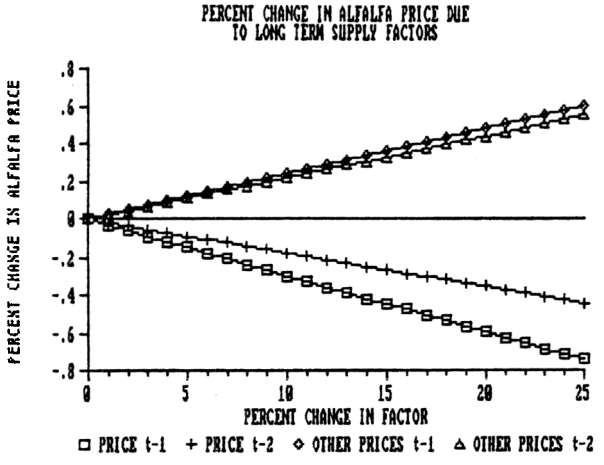
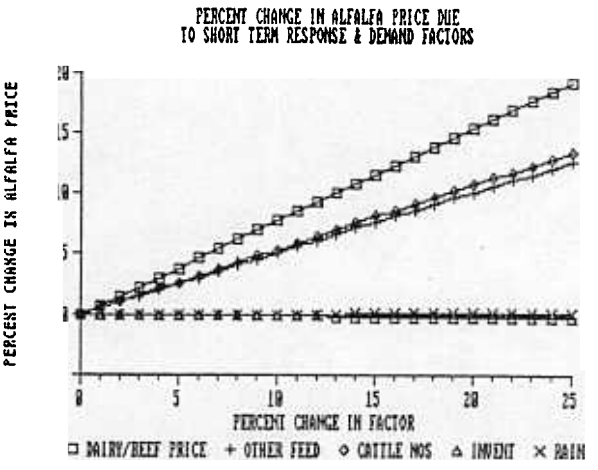


Figure 19.



LONG TERM OUTLOOK FOR ALFALFA

From the results of the brief analysis of factors influencing the California alfalfa market, changes in dairy and beef prices, the price of competing dairy feeds, and the number of total cattle are the most import factors influencing the price of alfalfa, but none has a significant effect on the quantity of alfalfa produced in any one year. The long term profitability of alfalfa relative to other crops is the most significant influence on the quantity of alfalfa produced. Thus, while the short term profitability of alfalfa is influenced to a significant degree by milk and meat prices and by cattle numbers, the longer term profitability of alfalfa is determined by a sustained increase in these factors.

In the last 10 years, milk prices have been trending down, until this year, but the trend has been off set by a significant increase in cow numbers interrupted only by the impacts of the Dairy Termination Program in 1987. In 1989 both total cow numbers and average milk prices have increased substantially. These increases together with the effect of the 1988 drought, have caused average alfalfa prices to skyrocket this year. For 1990, both milk prices and cow numbers are expected to remain relatively strong in California, thus creating a relatively buoyant alfalfa market in 1990.

Longer term trends in the California dairy industry are much less certain; and depend mainly on the outcome of debates on the 1990 Farm Bill. In general, if current policies that surround the dairy industry continue through 1995, then alfalfa producers can expect total cattle numbers to continue to increase, but milk prices will decline from their relative high this year. If, on the other hand, Congress mandates a supply control provision in the Dairy Title of the Farm Bill, cow numbers will probably stabilize, but prices may remain relatively buoyant.

The 1990 Farm Bill may also have some effect on the prices of alternative dairy/cattle feed and on the profitability of other crops. However, nothing has come about from recent debates. If anything, the profitability of alfalfa production relative to other crops may not change much over the next few years, in which case producers can look forward to relatively buoyant markets for alfalfa at least until 1995. Finally, two additional factors, not considered in the analysis, may affect alfalfa markets in the next 10 years. First, local and state water policies may change due to current pressures on water usage. An increase in the price of agricultural water may change the profitability of alfalfa production. On the other hand, other crops will also be affected by water prices and the profitability of alfalfa relative to other crops may not change substantially. At this time little change is expected. Second, there appears to be a growing interest and development in the alfalfa export market. Most alfalfa exported currently is sold to Japan, and conditions in that country will dictate future markets. Currently growth in alfalfa exports is not that strong, and there is nothing to indicate increasing strength. But if alfalfa exports into the Pacific Basin do increase, California alfalfa producers will be the primary beneficiaries.

In summary, short of another drought or any other unexpected (unpredictable) event on the market, there is little to indicate that demand for alfalfa in California will decline. In all probability, it will continue to expand. The cause of a continued increase in demand for alfalfa depends on provisions in the 1990 Farm Bill. Whatever happens, continued demand for alfalfa hay by the dairy industry will continue for at least the next 10 years or more.

ACKNOWLEDGEMENTS

This paper has drawn heavily on previous work by Craig Meadows (1988) and James Cothern (1988). Kim Norris prepared the tables and some of the graphs presented in the paper.

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Table 1
Hay Stocks on Farms and Ranches
December 31, 1980-88

STATE	December 31 1980	1981	1982	1983	1984	1985	1986	1987	1988
	-1000 Tons-								
Arizona	164.0	365.0	207.0	137.0	116.0	118.0	290.0	263.0	133.0
California	2,043.0	2,708.0	2,669.0	1,608.0	1,323.0	1,414.0	2,330.0	2,341.0	2,163.0
Idaho	2,682.0	3,120.0	3,073.0	2,712.0	2,850.0	3,036.0	3,304.0	4,008.0	3,648.0
Nevada	703.0	657.0	628.0	749.0	781.0	808.0	963.0	897.0	668.0
Oregon	1,798.0	2,382.0	2,165.0	1,958.0	2,185.0	2,023.0	2,100.0	2,200.0	1,665.0
Utah	1,276.0	1,338.0	1,530.0	1,328.0	1,089.0	1,231.0	1,559.0	1,503.0	1,155.0
Washington	1,621.0	1,733.0	1,652.0	1,337.0	1,528.0	1,471.0	1,868.0	2,104.0	1,700.0
7 Western States	10,287.0	12,303.0	11,924.0	9,829.0	9,872.0	10,101.0	12,414.0	13,316.0	11,132.0
United States	108,204.0	91,983.0	99,476.0	106,650.0	89,280.0	100,632.0	121,734.0	119,845.0	90,887.0
Seven Western/ United States	.0951	.1338	.1199	.0922	.1106	.1004	.1020	.1111	.1225

Source: National Agricultural Statistics Service

Table 2
Hay Stocks on Farms and Ranches
May 1, 1980-89

STATE	May 1 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	-1000 Tons-									
Arizona	77.0	25.0	109.0	333.0	73.0	66.0	55.0	25.0	41.0	27.0
California	620.0	542.0	471.0	337.0	368.0	314.0	400.0	345.0	360.0	173.0
Idaho	619.0	835.0	757.0	489.0	393.0	522.0	245.0	1,086.0	901.0	310.0
Nevada	216.0	164.0	105.0	125.0	195.0	135.0	130.0	206.0	207.0	67.0
Oregon	360.0	745.0	289.0	267.0	281.0	218.0	179.0	689.0	392.0	167.0
Utah	304.0	453.0	328.0	236.0	206.0	238.0	271.0	470.0	381.0	278.0
Washington	424.0	578.0	508.0	262.0	237.0	158.0	182.0	517.0	405.0	312.0
7 Western States	2,620.0	3,342.0	2,567.0	2,049.0	1,753.0	1,651.0	1,462.0	3,338.0	2,687.0	1,334.0
United States	33,346.0	25,429.0	26,155.0	29,052.0	20,558.0	26,863.0	26,698.0	32,418.0	27,353.0	17,627.0
Seven Western/ United States	.0786	.1314	.0981	.0705	.0853	.0615	.0548	.1030	.0982	.0757

Source: National Agricultural Statistics Service

Table 3
Alfalfa Hay Acreage
Seven Western States, 1980-89

STATE	Area Harvested 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989e
	-1000 Acres-									
Arizona	165.0	160.0	160.0	145.0	150.0	145.0	155.0	160.0	155.0	150.0
California	1,030.0	1,050.0	960.0	950.0	1,020.0	1,030.0	1,080.0	1,150.0	1,100.0	1,020.0
Idaho	1,090.0	1,100.0	1,020.0	1,030.0	1,050.0	1,020.0	1,100.0	1,020.0	920.0	930.0
Nevada	215.0	210.0	215.0	230.0	235.0	235.0	240.0	245.0	250.0	245.0
Oregon	425.0	425.0	420.0	440.0	445.0	450.0	460.0	430.0	415.0	425.0
Utah	470.0	475.0	470.0	455.0	470.0	460.0	470.0	465.0	480.0	490.0
Washington	505.0	500.0	490.0	440.0	475.0	450.0	470.0	460.0	490.0	460.0
7 Western States	3,900.0	3,920.0	3,735.0	3,690.0	3,845.0	3,790.0	3,975.0	3,930.0	3,810.0	3,720.0

Source: National Agricultural Statistics Service

e = estimated

Table 4
Alfalfa Hay, Average Yields
Seven Western States, 1980-89

STATE	Yield 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	-Tons-									
Arizona	7.0	7.0	7.3	7.3	7.2	7.1	7.6	7.8	7.9	7.9
California	6.4	6.3	6.7	6.4	6.5	6.5	6.6	6.7	6.6	6.6
Idaho	3.5	3.6	3.7	3.9	3.8	3.5	3.8	3.9	3.8	3.3
Nevada	3.5	3.6	3.5	3.9	4.0	4.1	4.1	4.2	4.2	4.2
Oregon	4.2	4.1	4.2	4.2	4.1	4.1	4.2	4.2	4.1	4.1
Utah	3.9	4.1	4.0	3.9	4.0	3.9	3.9	4.1	3.9	4.0
Washington	3.7	3.7	4.3	4.0	4.3	3.9	4.2	4.3	4.2	4.2

Source: National Agricultural Statistics Service

e = estimated

Table 5
Alfalfa Hay, Total Production
Seven Western States, 1980-89

STATE	Production 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989e
	-1,000 Tons-									
Arizona	1,155.0	1,120.0	1,168.0	1,059.0	1,080.0	1,147.0	1,178.0	1,248.0	1,225.0	1,185.0
California	6,592.0	6,615.0	6,432.0	6,080.0	6,732.0	6,592.0	7,128.0	7,705.0	7,260.0	6,732.0
Idaho	3,815.0	3,960.0	3,774.0	4,017.0	3,938.0	3,852.0	4,180.0	3,978.0	3,496.0	3,534.0
Nevada	753.0	746.0	753.0	897.0	940.0	936.0	984.0	1,029.0	1,050.0	1,029.0
Oregon	1,785.0	1,743.0	1,764.0	1,848.0	1,825.0	1,778.0	1,932.0	1,806.0	1,702.0	1,742.0
Utah	1,833.0	1,948.0	1,880.0	1,775.0	1,880.0	1,833.0	1,833.0	1,907.0	1,872.0	1,960.0
Washington	1,869.0	1,850.0	2,107.0	1,760.0	2,043.0	2,050.0	1,974.0	1,978.0	2,058.0	1,932.0
7 Western States	17,802.0	17,982.0	17,878.0	17,436.0	18,438.0	18,188.0	19,209.0	19,651.0	18,663.0	18,114.0

Source: National Agricultural Statistics Service

e=estimated

Table 6
Total Alfalfa Supply
Seven Western States, 1980-89

STATE	Total Supply Available 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989e
	-1,000 Tons-									
Arizona	1,232.0	1,145.0	1,277.0	1,392.0	1,153.0	1,297.0	1,233.0	1,273.0	1,229.0	1,212.0
California	7,212.0	7,157.0	6,903.0	6,417.0	7,100.0	6,906.0	7,528.0	8,050.0	7,600.5	6,905.0
Idaho	4,434.0	4,795.0	4,531.0	4,506.0	4,331.0	4,374.0	4,425.0	5,064.0	4,501.0	3,844.0
Nevada	969.0	910.0	858.0	1,022.0	1,135.0	1,071.0	1,114.0	1,235.0	1,232.0	1,096.0
Oregon	2,145.0	2,488.0	2,053.0	2,115.0	2,106.0	1,996.0	2,111.0	2,495.0	2,109.1	1,909.0
Utah	2,137.0	2,401.0	2,208.0	2,011.0	2,086.0	2,071.0	2,104.0	2,376.5	2,289.0	2,238.0
Washington	2,293.0	2,428.0	2,615.0	2,022.0	2,280.0	2,208.0	2,156.0	2,495.0	2,450.8	2,244.0
7 Western States	20,422.0	21,324.0	20,445.0	19,485.0	20,191.0	19,923.0	20,671.0	22,988.5	21,411.4	19,448.0
United States	113,225.0	109,221.0	116,668.0	111,264.0	110,575.0	111,911.0	118,250.0	116,972.0	96,635.0	N/A
Seven Western/ United States	.18	.20	.18	.18	.18	.18	.17	.20	.22	N/A

Source: National Agricultural Statistics Service

e=estimated

Table 7
California Hay Crop Production and Yield: 1978-89
Alfalfa and Other Hay Mixtures

Yield	Alfalfa	Yield :	Other Hay	Yield :	Total Crop	Avg. Yield
	-1000 Acres-	-Tons-	-1000 Acres-	-Tons-	-1000 Acres-	-Tons-
1978	1,090	5.45	520	1.95	1,610	4.31
1979	1,050	6.00	510	1.95	1,560	4.67
1980	1,030	6.40	520	2.20	1,550	4.99
1981	1,050	6.30	515	2.40	1,565	5.01
1982	960	6.70	510	2.40	1,470	5.20
1983	950	6.20	530	2.50	1,480	4.87
1984	1,020	6.60	530	2.40	1,550	5.16
1985	1,030	6.50	540	2.40	1,570	5.02
1986	1,080	6.60	600	2.50	1,680	5.14
1987	1,150	6.50	520	2.50	1,670	5.39
1988	1,100	6.60	580	2.40	1,680	5.15
1989e	1,020	6.60	730	2.40	1,750	4.85

Source: California Crop and Livestock Reporting Service

e = estimated

Table 8
California Hay Crop Production and Inventories: 1978-89

Year :	Carryover : May 1 :	Alfalfa : Production:	Other Hay : Production :	Total Crop : Production :	Total Supply	: Carryover : December 31
			-1000 Tons-			
1978	1,082	5,940	1,014	6,954	8,036	2,226
1979	765	6,300	995	7,295	8,060	2,043
1980	620	6,592	1,144	7,736	8,356	2,708
1981	542	6,615	1,236	7,851	8,393	2,669
1982	471	6,432	1,224	7,656	8,127	1,800
1983	337	5,890	1,325	7,215	7,552	1,608
1984	368	6,732	1,272	8,004	8,372	1,323
1985	314	6,592	1,296	7,888	8,202	1,414
1986	400	7,128	1,500	8,628	9,028	2,330
1987	345	7,705	1,300	9,005	9,350	2,341
1988	360	7,260	1,392	8,652	9,012	2,163
1989e	173	6,732	1,752	8,484	8,657	N/A

Source: California Crop and Livestock Reporting Service

e = estimated

Table 9
Alfalfa Hay Price - California

	Dollars per ton
1980	84
1981	95
1982	84
1983	97
1984	85
1985	83
1986	77
1987	80
1988	89
1989	102

Source: County Ag. Commissioners' Data

TABLE 10

COMMERCIAL MILK PRODUCTION, DAIRY COWS
PRODUCTION PER COW AND COMMERCIAL DAIRIES
BY YEAR, CALIFORNIA 1975-1987

	MILK PRODUCTION (mil lbs)	NO. MILK COWS (000's)	PRODUCTION PER COW (lbs/cow)	NO. OF DAIRIES (no.)
1975	10,853	800	13,566	3,402
1976	11,575	811	14,273	3,125
1977	11,960	827	14,462	2,892
1978	11,867	846	14,027	2,864
1979	12,549	871	14,408	2,862
1980	13,577	896	15,153	2,873
1981	14,248	923	15,437	2,854
1982	14,528	940	15,455	2,845
1983	14,743	951	15,503	2,785
1984	15,299	967	15,821	2,781
1985	16,768	1,004	16,701	2,778
1986	17,240	1,013	17,019	2,531
1987	17,930	998	17,966	2,489
1988	18,679	1,015	18,403	2,433
1989 (P)	19,237	1,031	18,659	2,400

TABLE 11

AVERAGE PRICES PAID TO PRODUCERS: CALIFORNIA
ALL-WHOLE MILK 1975-1989
($ per cwt)

1975	$9.03
1976	$9.27
1977	$9.76
1978	$10.24
1979	$11.44
1980	$12.88
1981	$13.44
1982	$13.22
1983	$13.07
1984	$12.86
1985	$12.21
1986	$11.78
1987	$11.44
1988	$10.96
1989 (P)	$12.36

P = preliminary

Table 12.

U.S. AND CALIFORNIA MILK SUPPLY AND USE

UNITED STATES

	1988	1989	1990 (P)
MILK COWS (million)	10,243	10,137	10,041
MILK/COW (lbs)	14,200	14,350	14,709
PRODUCTION	$145.5	$145.5	$147.7
FARM USE	$2.2	$2.2	$2.2
MARKETINGS	$143.3	$143.3	$145.5
BEGINNING STOCKS	$4.6	$4.3	$4.2
IMPORTS	$2.4	$2.4	$2.4
TOTAL SUPPLY	$150.3	$150.0	$152.1
ENDING STOCKS	$4.3	$4.2	$4.2
COMMERCIAL USE	$137.2	$138.4	$140.8
CCC REMOVALS	$8.8	$7.4	$7.1
PRICE SUPPORT	$10.60	$10.73	$10.10
ALL-MILK PRICE	$12.24	$13.30	$12.15

CALIFORNIA

	1988	1989	1990 (P)
MILK COWS (million head)	1,015	1,031	1,045
PRODUCTION PER COW (lbs)	18,403	18,659	19,200
MILK PRODUCTION (mil lbs)	18,679	19,237	20,064
		$ per cwt	
AVERAGE PRICE ALL MILK (3.5%)	$10.96	$12.36	$11.36
AVERAGE COST OF PRODUCTION	$10.31	$10.77	$10.30
MARGIN	$.65	$1.59	$1.06

P = projected