Irrigated Pasture Costs

studies revealed costs per animal-unit month varied from $1.00 to over $7.00

B. B. Burlingame

Recent irrigated pasture cost studies conducted in Butte, Colusa, Sacramento, San Joaquin, and Yolo counties revealed wide variations.

Costs and the amounts of pasturage obtained per acre were found to vary among individual records because of differences in management practices, soil types, kinds of plants in stands, and source of water.

Pasturage in the studies was measured in terms of animal-unit months. An animal-unit month was considered to be equivalent to the average amount of total feed which would be consumed per month by a mature beef animal or a dairy cow producing 200 pounds of milk fat per year. This unit was also considered to be equal to approximately 400 pounds of total digestible nutrients or the equivalent of 0.4 ton of hay. All livestock using pastures were converted to this basis, depending upon their probable total feed consumption. For example, dairy cows giving 400 pounds of milk fat per year were rated at 1.33 animal units, yearling dairy heifers at 0.66 animal unit, lambs—70 to 90 pounds—at 0.15 animal unit, and mature sheep at 0.20 unit. Other feed given to animals while they were on pasture was deducted from total feed requirements in calculating the net animal-unit months from pasturage. Any hay harvested was converted to animal-unit months and added to pasturage, but the costs, aside from mowing, were not included.

Pastures in the study ranged in age from one to 15 years. The cost of establishing these stands depended largely upon the amount of land preparation required, the seed mixture used, wage rates, and seed prices at time of planting. Original costs varied from a few dollars, where seed was sown in old alfalfa stands, to $30 an acre. Depreciation on most stands was calculated at 10%. Interest on investment charges was computed at 5% of average value of stands, fences, irrigation, and other facilities. Average values for the life of these items were figured at one-half the original cost. Land values used in computing interest costs were based upon normal agricultural values which were somewhat lower than market values during the four years indicated.

Total annual costs on individual pastures in the studies ranged from about $16 to over $50 per year. Pasturage obtained was from five to over 20 animal-unit months per acre per year. These wide variations in costs and use resulted in some pastures having a cost per animal-unit month as low as $1 while others ran as high as $7 or more. All records in the four years of the studies averaged $3.14 per animal-unit month. The average cost per 100 pounds of total digestible nutrients supplied by the pastures was one-fourth of this figure, or 79c. Hay averaging 50% total digestible nutrients could cost only $7.90 per ton to be equally as cheap.

Irrigation was the most important an-

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Summary of Irrigated Pasture Management Study Records in Northern California Counties,* 1944, 1945, 1946, and 1947: Mature Stands.

	1944	1945	1946	1947
Total number of records in studies	26	22	25	24
Total acres covered by records	1,472	919	1,068	1,188
Animal-unit months of pasturage per acre:				
January	0.1	0.2	0.1	0.1
February	0.2	0.2	0.2	0.1
March	0.5	0.5	0.5	0.6
April	0.8	0.8	1.0	1.0
May	1.4	1.4	1.5	1.3
June	1.5	1.5	1.5	1.3
July	1.4	1.5	1.2	1.2
August	1.3	1.5	1.1	1.2
September	1.3	1.4	1.1	1.1
October	1.0	1.2	1.0	0.9
November	0.3	0.6	0.4	0.4
December	0.2	0.1	0.2	0.2
Total for year	10.0	10.9	9.8	9.4
COSTS				
Cost per acre:				
Irrigation labor	$ 6.16	$ 7.88	$ 8.69	$ 7.04
Other labor (fence work, fertilizing, clipping, etc)	1.88	2.69	2.65	1.63
Water cost of power for pumping	5.03	5.07	3.68	5.34
Other materials (see fertilizer, etc.)	2.07	4.80	2.14	1.56
County taxes	1.30	1.24	1.44	2.62
General expense and other cash costs	0.99	1.13	1.03	.80
Depreciation on stand	1.74	1.57	1.79	2.32
Depreciation, irrigation system, fences, etc.	2.25	1.92	2.01	2.56
Total cash and depreciation costs	$21.42	$26.30	$23.43	$23.87
Interest on average value of stands, 5%	$ 0.43	$ 0.42	$ 0.41	$ 0.50
Interest on average value of facilities	0.98	0.91	0.92	1.72
Interest on normal land values	6.28	5.89	5.48	7.03
Total cost of production	$29.11	$33.52	$30.24	$32.62
Total cost per animal-unit month	$ 2.92	$ 3.09	$ 3.09	$ 3.48
Cost per 100 pounds total digestible nutrients†	$ 0.73	$ 0.77	$ 0.77	$ 0.87
Equivalent value of alfalfa hay per ton at above cost of total digestible nutrients	$ 7.30	$ 7.70	$ 7.70	$ 8.70

* Included records from studies conducted by the Agricultural Extension Service in Butte, Colusa, Sacramento, San Joaquin, and Yolo counties.

† Based on one animal-unit = 400 pounds total digestible nutrients.

Breeding of Mares

management and accurate records may increase percentage of live foals

Perry T. Cupps

Breeders of horses often are disappointed at the small percentage of live foals they obtain from breeding mares.

Horses are less efficient producers of young than other types of farm animals as the average foal crop is 45% to 55% of the mares bred while the average calf crop is 70% to 80%.

Breeding and management practices may be partially responsible for this low efficiency.

Breeding of horses tends to be seasonal because of the natural tendency for mares to breed only part of the year. Most mares manifest estrous cycles only during the spring and early summer although a few may have cycles at any season of the year. Also, breeders commonly breed their mares in the spring in order that foals may be born soon after the first of the year. Usually, the age of the animal is calculated as of the first of January, putting the foal born late in the season at a disadvantage.

The estrous or reproductive cycle is divided into several periods but only two can be distinguished from the behavior of the animal. One period, estrus, is the time at which the mare will accept the stallion. The other period, called diestrum, is the part of the cycle when the mare is not receptive to the male. The length of these periods is variable between individuals and in one individual from one cycle to the next.

Estrus has an average duration of six days and a range of from two to eleven days. Occasionally a mare will remain in estrus for a longer period of time.

In addition to the extreme variations in the length of the heat period, some individuals will show a split period; the animal being in heat for a day or two then out of heat for one or two days then back in heat again. These animals may be very difficult to settle. Some individuals do not show any signs of estrus—the so-called silent heat. Although the reproductive organs may be functioning properly, the mare may refuse the stallion.

The egg is usually shed from the ovary the day before the end of heat. It lives only a short time, six to twelve hours. The spermatozoa also live a very short time in the reproductive tract, with the average fertile time being between 24 and 36 hours.

Because the period of estrus is so variable and the life of the germ cells so short, it becomes apparent that fertile matings under standard management will not occur in all cases. In fact, settling the mares by one breeding or during one heat period is apt to be the exception rather than the rule.

The mares may also manifest estrus without ovulation. An animal may show all the external signs of heat but since no egg is shed she will remain sterile even though she is bred repeatedly. Heat without ovulation is more likely to occur in very young and very old animals and at the beginning and end of the breeding season.

The owner and breeder may be able to increase the breeding efficiency of his animals by observing them closely and keeping records of the cycles of the individual animals since each will tend to establish its own pattern. For example, if a mare has an estrus period of three days the optimum time for breeding is the second day. If she has an estrus period of seven days the optimum time for breeding is the fifth day. If she is bred on the second day chances for conception are very small.

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PASTURES

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nual cost item in the studies. On the average, a little over 60% of the total cash and labor cost was for water and irrigation labor. Water costs ranged from approximately $2 per acre on land in certain irrigation districts to over $20 where pumping was done from considerable depth. The labor cost of irrigating varied from less than $3 per acre to more than $17 per acre, due to differences in the method of irrigation, size of head and efficiency of the irrigation system.

Over 90% of the pasturage obtained by coöperators in the studies was during eight months—March through October inclusive. Total animal-unit months of pasturage for the four years of the studies averaged 10.0. Under favorable conditions, well-managed irrigated pastures in the Central Valley of California should produce at least 12 animal-unit months of feed at a total cost not over $30 per acre—as of 1948—which would result in a cost per animal-unit month of $2.50 or less.

Although most pastures in the studies were used by dairy cattle, a few records were obtained on gains in weights of lambs and steers. These indicated that a gross gain, excluding mortality, of between 400 and 500 pounds of lamb or beef is commonly produced from an acre of irrigated pasture after allowances for any supplemental feeds.

Several coöperators in the Colusa County study harvested Ladino clover seed from a portion of their acreage. This is a relatively new practice which paid quite well for some growers during wartime high seed prices. However, it appears that seed production will become a specialized business in itself, not combined with a balanced livestock program, since about 2½ to three months of feed are lost in the middle of the pasture season.

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BLACK SCALE

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leafy ground cover that makes the oleander a good insectary for the production of the African parasite.

In a hot dry climate the black scale thrives only on the branches resting on the moist ground and covered by fallen leaves. In such an environment the scale exists in all stages of development, more or less protected from such parasites as *Metaphycus helvolus.*

Many, if not most, of the young scale, however, crawl up and toward the light so that they settle down on the exposed parts of the plant. It is these wanderers from the hidden colony under the leaves that serve as hosts for the African parasite and thus maintain a continuous population of parasites for controlling the black scale on the adjacent citrus trees.

The number of oleanders needed per acre of citrus will vary according to the needs of individual groves.

The planting of large acreages solely to one species of plant tends to produce a less favorable balance in nature than that which occurs in a natural mixed planting. The planting of oleanders in a citrus grove, therefore, is a return to a more natural state and better natural control.

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