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## IRRIGATED PASTURES FOR DAIRY CATTLE - 1930 RESULTS

by

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This report briefly gives the results of pasturing 11 1/4 acres of irrigated Ladino clover for 1930, beginning May 5, and ending October 23. Previous results of the pasture have been given in a Progress Report, August 27, 1929, and in Experiment Station Bulletin 264, "Irrigated Pastures for Dairy Cattle," May, 1930.

A brief statement of the 1929 results is given for comparison with the 1930 results as set forth in this report.

Summary of 1929 Results

1. The pasture season covered 167 days with a total of 7,032 cow days. The average number of cows per acre was 3.74.
2. The value of the pasture in feed saved was 11.77¢ per cow per day. The cost per cow per day was 4.39¢ or a net return of 7.38¢ per cow per day.
3. The total digestible nutrients fed in the barn per cow per day was 10.297 pounds.
4. The total digestible nutrients obtained from the pasture per cow per day was 8.349 pounds.
5. The feed cost per cwt. of milk was \$1.175.
6. The total cost of the pasture for the season was \$308.85.
7. The total net return for the pasture in feed saved was \$518.75 or about \$46.00 per acre.

1930 Results

During the 1928 and 1929 pasture seasons the 11 1/4 acres of Ladino clover was equally divided into three fields, designated A, B and C. For the 1930 season each of these three fields was equally subdivided, making 6 fields in all. This was to allow more frequent rotation from one field to another. The fields were designated as A1, A2, B1, B2, C1 and C2.

In this report results were determined by the use of the same method as was used for the 1928-29 seasons. A representative group of animals was used to give the necessary data.

On May 5 the cattle were turned on pasture A1. This was the earliest date that the ground was dry enough to allow pasturing and was four days earlier than in 1929. Pasturing continued until October 23 except for the period July 29 to August 13 inclusive. There were 154 days of actual pasturing in 1930

compared to 167 for the 1929 season. The carrying capacity was not as great, there being a seasonal average of 2.9 cows per acre as against 3.7 for 1929. The cows were given less feed in the barn during the 1930 season, thereby causing heavier grazing by the individual animal and resulting in lower carrying capacity.

Table I gives a summary of the records on two groups of cows totaling 3,584 cow days of the total 5,208 cow days for the 1930 season. Group 1 consists of 26 animals pastured from May 5 to July 27, inclusive. Group 2 consists of 25 animals pastured from August 14 to October 8, inclusive. The feed prices used in Table I are as follows: corn silage \$7.00 per ton; alfalfa hay \$10.00 per ton; oats and vetch hay \$10.00 per ton; and the grain mixture \$34.00 per ton. These are the same prices as used for the various feed stuffs in computing the 1929 results.

Table I. Summary of Ladino Clover Pasture Record 1930.

	I	II	Total	Average
Number of cows	26	25	51	
Total cow days	2184	1400	3584	
Total initial weight, lbs.	23,685	23,644	47,329	928.02
Total gain in weight, lbs.	1,328	328	1,656	.462
Total milk production, lbs.	53,898.2	30,640.2	84,538.4	23.588
Total butterfat production, lbs.	2,126.30	1,113.58	3,239.88	.9041
Total corn silage fed, lbs.	35,724	13,838	49,562	13.828
Total oat and vetch hay fed, lbs.	8,580	--	8,580	2.394
Total alfalfa hay fed, lbs.	--	4,891	4,891	1.365
Total grain fed, lbs.	9,045	7,051	16,096	4.491
Total digestible nutrients required, lbs.	40,008.69	22,435.30	62,443.99	17.423
Total digestible nutrients fed in barn, lbs.	15,832.0	9,045.4	24,877.4	6.941
Total digestible nutrients from pasture, lbs.	24,176.69	13,389.90	37,566.59	10.482
Total cost of corn silage	\$125.03	\$48.43	\$173.46	
Total cost of oat and vetch hay	\$42.90	--	\$42.90	
Total cost of alfalfa hay	--	\$24.45	\$24.45	
Total cost of grain	\$153.76	\$119.87	\$273.63	
Total cost of feed in barn	\$321.69	\$192.75	\$514.44	
Cost of pasture	\$155.50	\$99.68	\$255.18	
Total cost of feed	\$477.19	\$292.43	\$769.62	
Feed cost per cwt. of milk	.8854	.9544		.9104
Total feed cost per cow per day	.2185	.2089		.2147

The average total digestible nutrients required daily by the average cow for maintenance, gain in weight, and milk and butterfat production for the 1930 season was 17.423 pounds. The average total digestible nutrients fed per cow daily in the barn, as indicated in Table I, was 6.941 pounds or 3.356 pounds less than was fed per cow per day during the 1929 season. The average total digestible nutrients received from the pasture per cow per day was 10.482 pounds or 2.133 pounds greater than for the 1929 season. In other words, the pasture was made to produce 2.133 more pounds of total digestible nutrients per cow per day during 1930 than for 1929. This resulted in decreasing the feed cost of producing 100

pounds of milk from \$1.175 in 1929 to \$0.910 in 1930, a decrease of 26 1/2 cents per 100 pounds of milk. The reduction of feeds fed in the barn and the greater consumption of cheaper pasture nutrients resulted in a feed cost per cow per day of \$0.2147 which is \$0.0398 less than for the 1929 pasture season.

During the latter part of July it was found that the pastures were being grazed beyond their carrying capacity. From July 29 to August 13, inclusive, grazing was discontinued and the cows were stall fed. This afforded an opportunity for a check period of dry feeding.

Table II gives a summary of the records on 26 cows from July 30 to August 12, inclusive. The animals in this group are the same ones which were used in Group 1 of Table I. There was a transition period of two days between pasture and dry feed records.

Table II. Summary of Dry Feed Period - 14 Days

	Total	Average per Cow per Day
Number of cows	26	
Total initial weight, lbs.	24,428	940.0
Total gain in weight, lbs.	1,230	
Average daily gain in weight, lbs.		.338
Total milk produced, lbs.	7,484.8	20.56
Total butterfat produced, lbs.	283.12	.778
Total corn silage fed, lbs.	10,920	30.
Total alfalfa hay, lbs.	4,662	12.807
Total grain fed, lbs.	1,662	4.566
Total cost of corn silage	\$38.22	
Total cost of alfalfa hay	\$23.31	
Total cost of grain	\$28.25	
Total cost of feed in barn	\$89.78	
Feed cost per cwt. of milk	\$1.199	
Feed cost per cow per day	.2466	.2466

A study of Table II shows that there was less gain in weight per cow per day as well as less production while on dry feed. The feed cost per 100 pounds of milk was \$1.199 or 29¢ greater than that required to produce the same amount of milk while on pasture.

Table III gives the costs of the pasture for the 1930 season. The costs for this season were increased over the 1929 costs due to greater applications of fertilizer and more necessary repair for maintenance of dam and ditches.

Table III. Costs of Pasture for 1930

1. Original investment - entire project	---	\$ 16.55
2. Original investment - Ladino clover area	--	44.49
3. Cost of fertilizer	-----	87.20
4. Interest on land - \$100 valuation @ 5%, 11 1/4 acres	-----	56.25
5. Interest on land improvements, \$444.93 @ 5%	-----	22.25
6. Interest on irrigation system @ 5%	-----	8.27
7. Taxes	-----	20.25
8. Maintenance of dam, ditches, headgates, fences, etc.		66.10

Table III. (Continued)

9. Labor for irrigation -----	\$ 49.65
Total -----	\$371.01

The fertilizer treatment of the Ladino clover pasture in 1930 is given in Table IV.

Table IV. Fertilizers Applied to Ladino Clover Pasture -- 1930

July 19, 1930	Field Bl-333 lbs.	Red Steve 6-10-4	orchard fertilizer	\$ 9.25
" "	" "	B2-333	" " " " " "	9.25
" "	" "	C1-333	" " " " " "	9.25
" "	" "	C2-333	" " " " " "	9.25
July 22	" "	A1-333	" " " " " "	9.25
" 29	" "	A2-333	" " " " " "	9.25
July 30	"	1 ton landplaster - 333 lbs.	per field	13.50
Total cost of fertilizer - 1930				\$ 69.00
Total labor for applying fertilizers				9.04
Total cost of fertilizer and labor for applying - 1930				\$ 78.04

1930 fertilizer charge:

50 % of 1930 cost	\$39.02
30 % of 1929 cost	34.34
20 % of 1928 cost	13.84
Total fertilizer charge 1930	\$87.20

Table V gives a summary of the results for the 1930 pasture season. Pasturing was begun with 42 animals or 3.62 cows per acre. Later in the season this was found to be too many per acre of pasture, consequently the number was reduced until the average for the season was 2.96 cows per acre. In determining the pasture equivalent in hay and silage, the price for each is the same as was used for the 1929 results.

The net return in feed saved was slightly lower than for 1929 due to a greater pasture cost for the 1930 season, a shorter season, and not as many cows per acre. The cost of pasture per cow per day was .0712 or .0273 greater than for 1929. However, the total cost of feed per cow per day was .0398 less in 1930 than for 1929. Therefore, there was a saving of .013 cents in feed cost per cow daily or \$67.70 for the 5208 cow days. This represents the increased saving in cost of feed for the 1930 season over the 1929 season.

As shown in Table V the gross pasture return for 1930, based on the total digestible nutrients obtained, expressed in terms of alfalfa hay and corn silage equivalent at \$10 and \$7 per ton respectively, was \$838.49. The total pasture costs, given in Table III, were \$371.01 making a total net return from the

pasture in feed saved of \$467.48. This represents a net return of \$41.01 per acre. With all costs taken into consideration this represents a return of about 26 1/2 per cent on the \$150 per acre investment.

Chart I represents the average weekly production for 12 cows for 13 weeks dry feed in the barn, followed by 11 weeks on Ladino clover pasture, 2 weeks in the barn, and another 3 weeks on Ladino clover. The average length of time in milk for the 12 cows was 16 weeks at the start, April 13. The actual production of these twelve animals is plotted against the Eckles curve, showing decline in production due to increase in length of lactation and gestation.

The chart shows a significant increase in production when the cows were turned on pasture the 19th week of lactation.

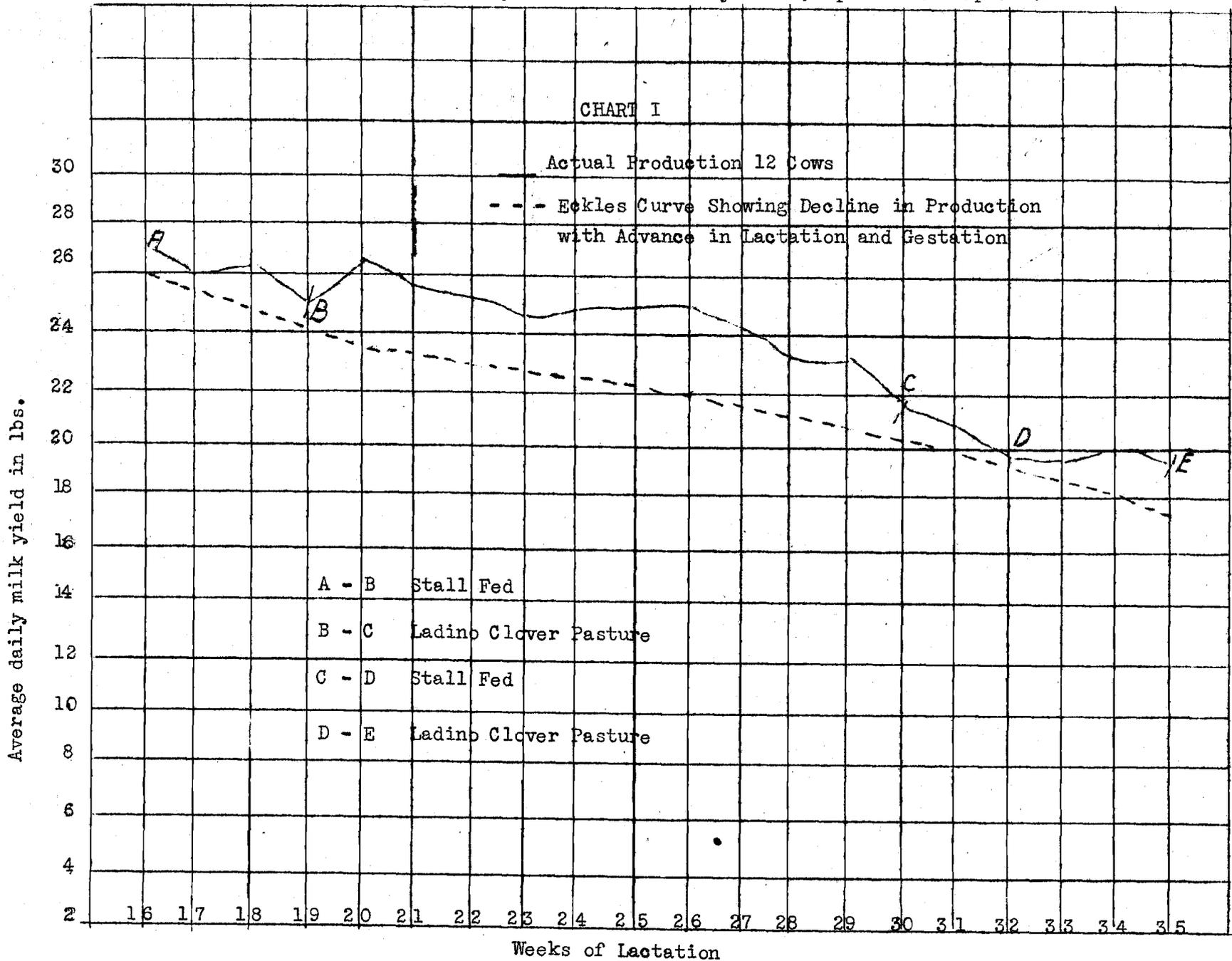
The sharp decline in production during the 29th week is due to the lack of pasture. It is interesting to note the continued decline during the dry feed period and until the 32nd week when pasturing was resumed. At this point the production increases in contrast to the sharper decline shown by Eckles curve.

Table V. Pasture Results for 1930.

Length of grazing season, days - - - - -	154
Average daily number of cows per acre for 154 days - - - - -	2,967
Total cow days on Ladino Clover, days - - - - -	5208
Average oat and vetch supplement per cow per day, lbs. - - - - -	2,394
Average alfalfa supplement per cow per day, lbs. - - - - -	1,365
Average grain supplement per cow per day, lbs. - - - - -	13,828
Average weight per cow when placed on pasture, lbs. - - - - -	930.78
Average gain in weight per cow, lbs. - - - - -	.434
Average milk production per cow per day, lbs. - - - - -	23.588
Average butterfat production per cow per day, lbs. - - - - -	.9041
Total digestible nutrients required by average cow daily, lbs. - - - - -	17.423
Total digestible nutrients fed in barn daily to average cow, lbs. - - - - -	6,941
Total digestible nutrients obtained from pasture by cow daily, lbs. - - - - -	10,482
Pasture equivalent per cow per day	(alfalfa, lbs. - - - - - 10.00 (corn silage, lbs. - - - - - 31.68)
Pasture returns per cow per day, alfalfa \$10.00 per ton, corn silage \$7.00 per ton - - - - -	0.1610
Gross pasture returns, 5208 cow days - - - - -	\$838.49
Cost of pasture for the season - - - - -	371.01
Cost of pasture per cow day - - - - -	.0712
Net return from pasture in feed saved - - - - -	467.48
Net return from pasture per cow day - - - - -	.0896
Net return from pasture per acre - - - - -	\$ 41.01

Average Daily Milk Production by Weeks, April 15 - September 3

6.



Summary

1. In 1930 the cows were given less feed in the barn, which resulted in heavier grazing and a lower carrying capacity of cows per acre than in 1929. However, the net returns per cow per day were greater in 1930 than in 1929, due to a lower cost of supplemental feeding.
2. The total digestible nutrients obtained from the pasture were greater than for 1929.
3. The cost per cwt. of milk was \$0.910 or 29¢ less than cost of producing 100 pounds milk on dry feed.
4. The feed cost per cow per day was .2147¢ or .0398¢ less than in 1929.
5. Production was maintained at a fairly constant level throughout the late summer months.
6. The pasture return was equivalent to feeding 10 pounds of alfalfa hay and 31.6 pounds of corn silage per cow per day and at the same time a higher level of production was maintained.
7. The gross return from the pasture in feed saved in 1930 was \$838.49. This was \$10.89 larger than in 1929. However, the pasture costs were \$371.01 in 1930 compared to \$308.85 in 1929. Thus the net return in 1930 was \$467.48 or \$51.27 less than in 1929. The net return per acre in 1930 was \$41.01 compared to \$46.11 in 1929.