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Clipping weights alone do not show the complete value of fertilization. For example, the nutrient content of the grass may be increased and cattle distribution may be improved. It is known that cattle often prefer fertilized grass. On the other hand, cattle may not harvest as much grass as shown by the clipping weights and, furthermore, it may not be desirable from the standpoint of the grass.

Still Some Questions

Range grasses will respond dramatically to fertilization under certain conditions. However, many questions are not answered about the value and economics of range fertilization. Among these questions are costs of fertilization and possible returns in yield. The use of extra forage produced depends on the feed supply and cattle numbers on hand. Soil tests may show areas of greatest response. Proper time of application may further insure returns.

These experiments, as well as a few others in the past, have indicated that best results will be obtained when fertilizers are applied after the start of the rainy season. Nitrogen fertilizer moves readily into moist soil and is not as likely to be lost as when broadcast on hot dry soil prior to summer rains. Summer rains produce about 90 percent of the perennial grass forage in southern Arizona, and maximum use of fertilizer will be made soon after the plants begin to grow. The nature of the rainy season is such that, once started,



COW-CALF MATCHING champ at an Angus Field Day at the U of A was Ken Ryan, 16, son of Mr. and Mrs. Walter R. Ryan of Marana. Ken, member of the Marana FFA chapter, made highest score in matching calves with their dams.

additional rains are likely, helping to insure adequate moisture. Selection of soil types with good infiltration rates and moisture storage capacity also insures maximum benefits of rainfall.

Fertilization probably will play an increasing role in ranching in certain areas of Arizona.

Effect of Fertilizers on Yield of Range Grasses During 1964

Location	Treatment		Vegetation	Rainfall measured in.
	N-P-K lbs./A	Yield, Dry Matter lbs./A		
Kitt Peak	0-0-0	1,260	Native Gramas, and Three/awns	8.05 July 13 to Sept. 2
	200-88-0	1,370		
Scott's, Gila Co.	0-0-0	520	Native Three/awns and Gramas	11.57 July 24 to Sept. 19
	50-0-0	1,560		
	100-0-0	2,650		
	50-44-0	1,950		
	100-44-0	2,730		
Rodger's, Gila Co.	0-0-0	300	Blue Grama and Three/awns	Estimated to be average (20-22" annually)
	50-0-0	1,250		
	100-0-0	2,300		
	50-44-0	1,460		
	100-44-0	2,510		
	0-44-0	230		
Bisbee	0-0-0	1,590	Lehmann Lovegrass	3.25* Aug. 1 to Sept. 3
	100-0-0	2,970		
	200-0-0	3,090		
	100-60-0	3,460		
	200-60-0	3,440		

* July rains fairly abundant but not recorded.

Do Imports Affect U.S. Cattle Prices?

By Robert A. Young
and
James Simpson

The monthly average price paid for steers of Choice grade at Chicago declined from \$30.13 per hundredweight in November 1962 to a low of \$20.52 per hundredweight in May 1964. Since beef cattle represent an important segment of the U.S. agricultural economy (accounting for an average of \$7.7 billion per year in sales for the period 1958-63), serious concern over this situation has been expressed by domestic cattle feeders and range cattle producers. Their concern has been widely echoed by private and public organizations in those states and communities where the production and marketing of cattle is an important source of income and employment.

At least two major developments relating to the supply of beef have been associated with this falling price of fed cattle. First, total cattle numbers in the United States in 1964 reached an all-time high of over 107 million head, some 17 percent above the cattle population at the beginning of the cycle in 1958. Slaughter of cattle rose accordingly. Production of beef in 1963 was at an all-time high, and 1964 brought another new record. Second, shipments of live and dressed beef into the United States by exporting nations had jumped from an average of less than three percent of United States consumption in the period of 1952-57, reaching levels of nearly 10 percent of total U. S. supplies of beef in calendar 1963. Sharply conflicting opinions have been expressed as to the relative impact of changes in these supply factors upon the price of cattle in the United States.

This is first of two articles which will review and analyze the evidence as to the effect of these conditions

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on the price of fed cattle. We shall consider first the factors leading to the increased imports of beef into the United States and the effect of these imports on domestic cattle prices.

Why Imports Increase

Most imported beef is frozen and boneless, of grades suitable for use only as hamburger or in the processed meat industry. Australia and New Zealand alone are responsible for some two-thirds of the beef shipped into the United States, accounting for 46 percent and 22 percent, respectively, of imports in 1962. The balance has come mostly from Ireland, Canada, Mexico and Central America.

Several factors have contributed to the increased supplies of beef from outside this country. First, under long term agreements made in early postwar years, the United Kingdom contracted to purchase much of the exports of meats from Australia and New Zealand at guaranteed prices. These agreements were relaxed, particularly in 1958, and the last was terminated in 1960. Exports to the United Kingdom from Australia and New Zealand declined sharply after 1958 (from about one-third of the United Kingdom's imports to about one-tenth by 1963) while exports by these nations to the United States during the same period increased rapidly.

Second, the governments of ex-



DR. F. EUGENE NELSON, professor in the U of A Department of Dairy Science, was installed as president of the American Dairy Science Association at its 60th annual meeting June 20-23, at the University of Kentucky, Lexington. This Association has more than 2,500 members. Dr. Nelson was vice president of A.D.S.A. the past year, and previously was a director and also a member of numerous A.D.S.A. committees. He was editor of the *Journal of Dairy Science* for six years. In 1953 he received the Borden Award of A.D.S.A. for research on the microbiology of dairy products.

porting nations, through assistance programs, tax benefits and price guarantees, have stimulated the produc-

tion of beef to levels which could not be absorbed in their traditional markets.

Less Cow Beef Available

A third general consideration relates to the supply and price of low grade beef in the United States. Cow and bull beef — which goes largely toward satisfying the demand for manufacturing meats and hamburger — prior to the current cycle accounted for about 20 percent of domestic beef consumption.

During the rising phase of the current beef cycle, supplies of cow beef declined as cattlemen reduced culling rates and built up their herds. Measured on a per capita basis, production of low grade beef (cow and bull beef) in the United States was down markedly in the period 1958-63. (See Table). In response to these lower supplies, prices for cull cows and the low grade beef derived from them have been favorable over the period, relative both to previous levels and to markets elsewhere in the world. (See Table).

Thus, a period of relatively short supplies and favorable prices for lower grade beef in the United States coincided with conditions of increased production and diminished markets for the traditional beef exporting countries of the world. Changes in the beef situation since 1947 are shown in the table. Column 3 shows the per capita production of cow and bull beef. Column 4 shows imports and Column 5 shows the total of low grade beef supplies. It is apparent that rising imports of beef have served to maintain the per capita supply of low grade beef.

Beef is beef — or is it? Would additional supplies of imported beef have the same effect on the price of fed cattle as would equivalent increases in supplies of fed cattle?

Little Effect on Fed Beef

The evidence indicates that supplies of low grade beef (including imports) have a relatively minor influence on prices of fed cattle.

Statistical analyses by USDA demonstrate that the characteristics of demand for different grades of beef are such that steer and heifer beef (largely fed beef) on the one hand, and cow and bull beef (low grade beef) on the other, can be regarded as separate and distinct commodities. Little of the low grade beef or imported beef substitutes directly for the higher quality product.

Statistical studies by the authors
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Per Capita Production of Beef and Veal by Major Classes, Imports of Beef and Veal, and Prices, United States, 1947-63^a

(1) Year	(2) Production of steer and heifer beef, and veal	(3) Production of cow and bull beef	(4) Imports of beef and veal	(5) Cow and bull beef production plus imports	Prices (per cwt., Chicago)	
					(6) Utility cows	(7) Choice steers
					(dollars)	
1947	53.0	28.5	0.4	28.7	14.26	26.22
1948	44.7	24.8	2.4	27.2	19.49	30.96
1949	50.2	20.1	1.7	21.8	16.33	26.07
1950	48.2	21.0	3.4	24.3	19.36	29.68
1951	43.3	19.7	3.8	23.5	24.48	35.96
1952	48.8	19.1	3.1	22.2	19.53	33.18
1953	62.6	24.0	2.1	26.1	12.41	24.14
1954	63.0	25.9	1.7	28.0	11.46	24.66
1955	63.2	27.4	2.0	29.4	11.52	23.16
1956	68.1	26.4	1.5	28.0	11.37	22.30
1957	66.6	24.3	3.7	27.9	13.61	23.83
1958	63.6	18.6	7.3	25.9	18.41	27.42
1959	64.6	16.5	7.2	23.7	17.79	27.83
1960	69.8	17.0	5.3	22.3	15.68	26.24
1961	72.8	15.3	7.1	22.4	15.66	24.65
1962	70.8	16.0	9.4	25.6	15.50	27.67
1963	75.9	15.1	10.0	25.1	15.10	23.96
1964 ^b	81.5	18.5	7.1	25.6	13.72	23.09

^a Source: Economic Research Service, U. S. Department of Agriculture.

^b Preliminary.

SPRINKLING COTTON WITH SALINE WATER

By C. D. Busch and Fred Turner, Jr.

When the water quality is low, then sprinkler irrigation management can influence cotton yields.

A sprinkler irrigation system was installed on three acres of the Safford Experiment Station late in the spring of 1964 to determine if cotton can be successfully sprinkler-irrigated with high salt-content water. The well, serving the sprinkler system, has an average salt content of over 3,000 parts per million. At this concentration the water carries four or five tons of salt in each acre foot.

Three comparisons were chosen to evaluate differences in the irrigation timing, type of cotton and ground preparation, and the effect they might have on cotton tolerance to sprinkler-applied saline water. They were:

Day vs. Night

1. Day vs Night Sprinkling. The

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are consistent with these findings. These measurements indicate that the supplies of low grade beef (including imports) and of other meats (pork, poultry, lamb) have only minor effects on the price of high quality beef (represented by the price of Choice steers, Chicago).

Works the Other Way

There is an influence in the other direction, however. It has been estimated that nearly one quarter of the meat from fed beef carcasses finds its way into hamburger and manufacturing uses. Hence, supplies of quality beef do have a substantial influence on prices of low grade beef.

Additional support for these conclusions can be found by examina-

tion of the effect of imports on the price of low grade beef (using the price of Utility grade cows at Chicago as a measure). As is shown in the table, imports per capita increased from 5.3 pounds in 1960 to 9.4 pounds in 1962, an increase of some 80 percent, while the average price per hundredweight of Utility cows decreased hardly at all.

2. Flat vs Bed Planting. A flat field surface will have more uniform evaporation and water distribution. The salts in the soil, therefore, can be expected to move up and down in the profile equally throughout the plot. On a furrow and bed surface more evaporation can be expected from the protruding beds especially when the plants are small. Consequently the bed surface may concentrate soil salinity.

3. Long Staple (S-2) vs Short Staple (1517D) Cotton. Plant varieties can show marked differences in salt tolerance at various stages of growth.

Since the sharply increased levels of imported beef have not had a significant downward influence on prices in the markets of low grade beef, it does not appear likely that any major influence would be felt from imports on the fed beef markets.

In the next issue of *Progressive Agriculture* we shall continue the analysis with an examination of the effect of increased domestic supplies of beef on fed cattle prices.

Irrigations for both the sprinkler plots and adjacent furrow irrigated areas were scheduled from soil moisture tension readings to insure that all plots received adequate, but not excessive, moisture.

Compared With Other Method

Tensiometers were set at 12, 24, and 48 inch depths. The 12 inch depth, with a tensiometer scale reading of 50 or higher, was used to indicate the need for irrigation. Neutron moisture readings were taken immediately before and after each irrigation for an indication of moisture distribution.

First Year Results Reported

Three irrigations, each applying about three inches of water, were required during this season. An application rate of $\frac{1}{4}$ inch per hour was used throughout. Some salt burn, associated with spray drift, was noted when the plants were less than 12 inches tall. Water application including the 12 inch pre-irrigation totaled 22.8 and 21.0 inches for the night and day sprinkled plots respectively. An additional 6 inches of rainfall supplemented the irrigations.

An analysis of cotton leaves revealed noteworthy differences related to treatments this first year. The method of irrigation affected salt content in the cotton leaf. These differences are from within the leaf tissue, since the leaf samples were thoroughly washed in preparation for analysis. The differences appear to be only in the leaf, as a similar petiole analysis showed no pattern in salt concentration. Table 1 presents the leaf data averaged for two replications.

Table 1. Sodium Content of Washed Cotton Leaf Samples (percent of oven dry weight)

Variety	Irrigation Method	
	Sprinkler	Surface Furrow
Short Staple (1517D)	.67	.32
Long Staple (S-2)	.39	.13

Irrigation and equipment problems

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