

Keeping Yuma Cattle Cool

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Weather—and the fact that cattle don't sweat—complicates the business of making feedlot gains in the Yuma valley in summertime. Yuma has daytime temperatures reaching above 100 degrees f. at least six months of the year, with maximums up to 120 degrees.

Our research workers estimate that a 1,000 pound red steer, standing out in the sunlight of a Yuma summer day, would absorb enough solar heat to heat more than 40 gallons of water from freezing to boiling. And remember, cattle do not have active sweat glands.

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Progressive Agriculture

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EFFECT OF LEVEL OF CONCENTRATE AND NIGHT COOLING ON FEEDLOT PERFORMANCE OF YEARLING STEERS

Yuma, Arizona

June 21 to September 27, 1960 (99 days)

Concentrate level	Wind		No Wind		
	33%	55%	33%	55%	80%
No. steers	16	16	16	16	16
Av. initial wt. * (lbs.)	498	500	499	499	498
Av. final wt. * (lbs.)	686	701	692	693	703
Av. daily gain (lbs.)	1.90	2.03	1.95	1.96	2.07
Av. daily feed cons. (lbs.)	17.0	16.6	16.8	15.6	14.7
Feed/100 lb. gain (lbs.)	890	818	861	796	710

* Initial and final weights less 5% pencil shrink.

Many Cooling Devices

Various means of meeting the extremes of heat, so that feedlot cattle will continue to eat heartily and make satisfactory gains, have been tried. Shades are usual in all feedlots, fences are designed to allow air movement, foggers with water mists have been tried.

Recently University of Arizona trials at Yuma have employed, in combination, two more cooling possibilities, fans and rations with different levels of concentrates. The fan used is an airplane propeller device, similar to those used by citrus growers for frost protection.

The National Frost Protection Company of Burbank, California, designed and erected the fan used in the cattle experiments. A propeller 16 feet above the ground was tilted so that it rotated a

stream of air, moving 10 to 15 miles per hour. The experiment utilized 12 pens of eight 500-pound yearling steers of mixed breeding. The fanning trial extended from June 21 to September 27, 1960. The fan's air stream reached four of the groups of steers, while the other groups were used as controls. However, all pens of steers had 40 square feet of aluminum shade per steer.

Fan Used at Night

While humans in the Southwest want their air conditioning fans operating in the heat of the day, exactly the reverse was done with the cattle. Remember, bovines lack the evaporative cooling device of perspiration. There is no merit in blowing hot air on a steer when outside temperatures are 113 degrees, so the fans were turned on only when air tempera-

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OFFICIAL TEMPERATURE RECORDINGS IN CITY OF YUMA, 74 YEAR AVERAGE

Elevation		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
138	Highest	84	92	100	108	120	119	120	119	117	107	96	83	120+
	Lowest	22	25	31	38	39	50	61	58	50	38	29	22	22
	Avg. Hi.	76.9	83.0	90.9	97.6	104.9	111.9	113.3	112.3	110.6	103.0	87.0	76.8
	Avg. low	31.9	35.6	40.2	44.5	51.5	58.7	67.5	67.7	58.6	46.9	38.2	34.5

+ Maximum at Yuma airport, for same period of record, is 123 degrees.

New Mite Is Damaging To Bermudagrass

G. D. Butler, Jr. and D. M. Tuttle

Bermudagrass lawns in Arizona have been fairly free of pests but in August 1959 a new species of plant feeding mite was found attacking lawns in the Phoenix area. Throughout the summer of 1960 this mite was very damaging, and in some cases completely killed bermudagrass lawns throughout southern Arizona and portions of California.

The first noticeable damage to bermudagrass in the spring is found when lawns fail to begin their normal spring growth in spite of irrigations and fertilizer applications. The grass that does appear is damaged by the mites and has a typical rosetting and tufting of the growth, as shown in the illustration. This is due to the shortening of the internodes and to the apparent stimulation of abnormally excessive plant growth.

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ture was well below the body temperature of the animals.

The thermostatic control turned on the fan when the temperature dropped to 90 degrees, shut off again when the temperature climbed above that mark. In actual practice this meant fan operation from roughly 10 p. m. until 7 a. m.

In addition to outside heat, the steers—as is true of all ruminants—produce considerable heat within their bodies during digestion. The type of feed consumed by steers will influence this heat of digestion, a high roughage-low concentrate ration producing somewhat more heat than a low roughage-high concentrate ration.

Different Concentrate Levels

For that reason, three different concentrate-roughage levels were used for rations in this trial.

Rations fed:

	33.3%	55%	80%
Barley	33.3	50	70
Alfalfa ¹	66.6	45	20
Cottonseed meal	—	5	10
Cost per ton	\$41.60	\$46.40	\$52.00

¹ 1% tallow was added to the alfalfa hay before it was chopped. (Salt and a 50:50 salt; bonemeal mix were available at all times.)

Sick Lawns Host to Weeds

The mites remain hidden under the leaf sheaths and may vary in number from a few to a hundred or more under a single sheath. With heavy infestations the grass turns brown and dies. Eventually the grass in infested lawns becomes greatly thinned out, allowing the growth of weeds.

There are a number of factors that may influence the severity of mite damage to lawns. Different bermudagrass strains and varieties grown in pots under lathhouse conditions showed extreme variations in response to mite injury. In home lawns common bermudagrass was most severely injured, but portions of lawns of Tiffine and Tifgreen were also found infested.

Mites appeared to be less abundant in lawns where flood irrigation was used. In general, infestations were most apparent on dry ridges and along the margins of lawns. Lawns that were mowed closely showed the most injury, except in golf courses that received frequent close mowings. There may be more damage associated with the use of rotary power mowers, as they injure the grass more, particularly when cutting back heavy turf growth.

In some cases the mite damage was more severe in shaded or partly shaded areas at the edges of lawns during mid-summer although spring injury was more noticeable in warm sunny locations.

The treatment differences for rate of gain and feed consumption were small. The replication within treatment had relatively large differences so the results shown in the table can be used only to indicate trends. The use of night cooling with higher concentrate levels appears to be worthy of further investigation; however no differences in degree of finish were observable.

Checking the steers every 20 minutes for two nights a week yielded the following observations:

1. From 10:00 p.m. to 5:00 a.m., 80 to 90 percent of the steers were lying down. Between 1:00 and 2:00 a.m. there was a general restlessness and stirring in all groups.
2. During the hours of darkness, 15 to 30 percent of the cattle were lying down under the aluminum shade.
3. During the night, there were never more than 10 percent of the steers at the manger eating.
4. This behavior pattern remained remarkably consistent for the 99 days of the trial.
5. As far as could be determined, the steers paid no attention to the sound of the fan when it was operating.



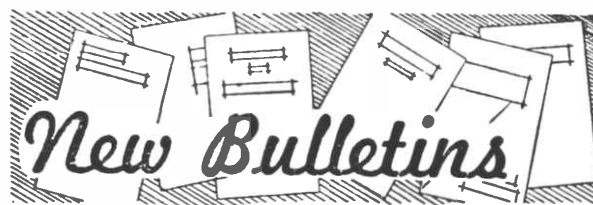
HEALTHY bermudagrass plant, above, and mite-damaged plant below. Note tufting as result of mite damage.

Two Types of Control

Chemical control of the mites can be accomplished with either the use of sulfur dust or Diazinon spray. Dusting sulfur containing 93% 325 mesh sulfur was effective when applied with a knapsack duster at the rate of approximately one pound per 100 square feet. A spray of Diazinon containing approximately one fluid ounce of 12.5% Diazinon was also effective when applied with water in a garden hose sprayer or a 3-gallon tank-type sprayer at the rate of one gallon per 200 square feet.

These treatments should be applied to the grass in the spring, as soon as the grass begins to become green. Additional applications may be needed at one to two month intervals throughout the summer.

The authors are members of the Entomology Department.



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