very similar to the bacteria counts. Dairies with milk not meeting minimum standards of quality are warned and, after a time, milk may be barred from the market until it is brought up to standard. Experience to date in areas where screening tests are used has demonstrated that a general upgrading of milk quality results.

Tests at the dairy

The screening tests are also very valuable to the dairyman and his veterinarian in solving the local problem. By testing bulk tanks, daily or at any chosen intervals, the dairyman can get an excellent idea of the quality of his milk. In the absence of specific operational changes the bulk tank scores for a given dairy tend to remain fairly constant from day to day.

If a quality problem exists, the individual cows can be tested (the CMT is generally regarded as the most practical on-the-farm test). By withholding the milk of high reactor cows from the tank, the remainder of the milk will almost always be acceptable again in the market. This enables the dairyman to market most of his milk while he and his veterinarian deal with the high reactors and develop a workable mastitis control program for the herd.

Many dairymen are finding it highly desirable to have monthly CMT tests run on their cows in conjunction with the Dairy Herd Improvement Association production testing program. This program offers a continuous record of individual cows as well as the herd status. By following the trends of reactions dairymen are able to see the results of their mastitis control programs and are able to spot trouble before it becomes extensive. Effects of changes in management or equipment operation can often be spotted early by changes in the CMT score. A milking machine part which has become defective, or a milker doing a poor job, are sometimes detected as a consequence.

As already pointed out mastitis is accompanied by an outflow of leukocytes into the milk. Their presence in excess in milk always indicates an inflammatory response to injury—whether it be mechanical, infectious, or a combination of both.

Such milk, which is considered of poor quality, not only contains the products of inflammation, but is of significantly reduced nutritional value as well. Work at the School of Veterinary Medicine and elsewhere has shown significant reductions of solids-not-fat (SNF) percentages in milk having positive CMT reactions. Reductions of SNF (chiefly lactose and casein) in excess of 20% can be seen in milk having the stronger CMT 3 scores. Cows whose mixed milk reacts at this level are also likely to be losing more than 20% of their total production from mastitis. The total loss of the valuable casein and lactose in such animals is therefore approaching 40%. Considering that the tank milk of some dairies reacts at this level, and that the milk from many will react at the CMT 2 level, the tremendous losses from low production and from low SNF can be visualized.

The great progress of the dairy industry makes mastitis control all the more important to assure the profitable production of milk with the highest nutritional quality and freedom from undesirable levels of bacteria and leukocytes.

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HELMINTHOSPORIUM LEAF BLIGHT

of Forage Sorghums in Southern California

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HELMINTHOSPORIUM LEAF BLIGHT, caused by the fungus *Helminthosporium turcicum*, was first noted on sudan leaves in San Bernardino and San Diego counties in 1956. Tests conducted in San Bernardino County in 1954 showed Sudan 23 and Piper to be the highest yielding varieties. At that time, they were outyielding Tift by about 20%. Consequently, most sudan acreage during this period was planted to the susceptible variety, Sudan 23. Characteristic symptoms of the Helminthosporium disease on sudangrass are elongated, linear lesions. The lesions are water soaked at first, and then turn brown to straw color. Under conditions favorable to the disease in San Bernardino and San Diego counties, entire leaf blades are killed.

Control of Helminthosporium leaf blight by seed treatment was considered impractical because infected volunteer plants are common near sudan fields. Consequently, varieties that have shown some resistance to the disease in other areas were initially recommended.

During 1958 through 1961, trials were conducted in San Bernardino and San Diego counties to evaluate resistance to the Helminthosporium fungus and to determine the yielding ability of several open-pollinated sudan varieties, several sudangrass-sorghum hybrids, and two varieties of millet. In each case, the plots were two rows 50 feet long, replicated four times. All plots were sprinkler-irrigated, a practice which appears to enhance development of the disease. The disease rating used was 1 to 5, with a "1" rating having a trace of the disease on the leaves, and a "5" rating indicating severe leaf damage. In most cases, the disease rating was the average of at least two observations made during the growing season. Disease ratings in June and July were always lower than those made in August and September, since the disease progressed as the season advanced. Results of the 1958 through 1960 trials are shown in table 1.

In San Bernardino County, observations only were made in 1959–60. Although Lahoma and Sweet Sudan showed resistance, relative growth of these varieties was very poor. As a result, Tift was recommended, with Greenleaf as an alternative variety.

The millets Gahi No. 1 and White Proso were also included in the 1960 tests in San Bernardino County. They appeared quite resistant to leaf blight—substantiating extensive observations of tests conducted in the southern United States. Millets are high forage yielders, and more extensive tests should be conducted to evaluate their adaptability. Sudo-Sorghum demonstrated moderate susceptibility in the same test.

In San Bernardino County in 1961,

Susceptibility of Sudan 23 to left, and resistance of Tift, right, to Helminthosporium leaf blight is evident in photo above. Note absence of lower leaves on Sudan 23.

TABLE 1—YIELD AND DISEASE RATING OF SUDAN VARIETIES, 1958–1960

Variety	San Diego County				San Bernardino County	
	1958[1]		1959[2]		1959	1960
	Leaf blight rating	Tons/acre dry matter	Leaf blight rating	Tons/acre dry matter	Leaf blight rating	Leaf blight rating
Lahoma	2	8.05	2	5.52	1.2	1.0
Greenleaf	1	7.67	2	7.39	1.9	1.7
Piper	3	7.58	2	8.09	2.0	2.5
Tift	2	7.44	2	6.74	1.0	1.0
Sudan 23	5	6.93	4	7.87	2.2	2.6
Sweet	4	5.91	3	7.25	1.3	1.1

[1] Severe leaf blight after first cutting—trial in Sudan 23 field.
[2] Mild leaf blight after first cutting—trial in Piper and Greenleaf field.

TABLE 2—YIELD AND DISEASE RATING OF VARIETIES—SAN BERNARDINO COUNTY, 1961

Variety	Tons/acre two cuttings (80% moisture)	Leaf blight rating*	
		Top	Bottom
Sudangrass-sorghum Hybrids:			
Frontier Hydan 37	47.4	2.8	3.8
Sudax SX-11	47.3	2.8	3.6
Lindsey 77F	45.4	3.0	4.0
Durrant GX 200	45.2	2.4	3.0
NK 145	42.4	2.6	3.2
Asgrow Grazer	40.3	2.6	4.0
Open-Pollinated:			
Tift	29.7	1.3	2.0
Sudan 23	25.0	3.2	4.2
Piper	24.9	3.0	3.4

* Lower leaves appeared to exhibit more damage, so readings were taken separately of the top and bottom leaves.

trials were expanded to include several of the more popular sudangrass-sorghum hybrids. In this case, the forage sorghums were furrow-irrigated, and yield and disease ratings were taken. The results of this trial are included in table 2.

The sudangrass-sorghum hybrids outyielded the open-pollinated varieties by as much as 22.5 tons per acre. Frontier Hydan 37, Sudax SX-11, Lindsey 77F, and Durrant GX 200 produced the highest yields of the sudangrass-sorghum hybrids. A medium to severe disease rating was noted for all the hybrids. Tift continued to be the most resistant of the open-pollinated varieties, and Sudan 23 was again very susceptible to the Helminthosporium fungus. Maturity of open-pollinated varieties was flowering on the first cutting, and mature seed on the second. All the sudangrass-sorghum hybrids were 5 feet tall at both harvests. Maturity varied from fully-headed to flowering at the first cutting, and from flowering to the hard dough stage at the time of the second harvest.

During the 1958 through 1960 trials, Helminthosporium was easily isolated or identified from samples taken in the field. Some difficulty was experienced during the 1961 and 1962 season in isolating the fungus. It is possible that part of the disease rating during these years might be attributed to a genetic or physiological breakdown of the leaf tissue.

In 1962, 29 sudangrass-sorghum hybrids (14 varieties were experimental and not commerically available), and three open-pollinated varieties were replicated five times and established in a sprinkler-irrigated field in San Bernardino County. A row of the susceptible Sudan 23 was sown between each of the other varieties to serve as a possible source of inoculum. Disease-rating observations were made at three different intervals during the growing season. Sudan 23 was again very susceptible, and practically all of the hybrids were moderately susceptible. Two experimental hybrids, GH-47 and 740-b, appeared to be resistant to Helminthosporium blight in these tests. Piper was moderately susceptible, with an average rating of 2.8.

The intensity of Helminthosporium leaf blight varies from year to year. Many growers feel the risk of disease is worth the increased yields of the sudangrass-sorghum hybrids. However, some San Bernardino County growers raise only the resistant Tift variety.

Observations of open-pollinated varieties in San Bernardino County during these trials indicated that they recover quicker than the sudangrass-sorghum hybrids if both are cut early (boot stage). Higher yields have also been obtained under these conditions in other areas of Southern California. If growers desire feed early, the first field planted in the spring is generally cut while still very immature. Under these conditions, some growers who plant several fields plant their first fields to sudan, and follow with the sudangrass-sorghum hybrids at a later date.

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Leaf blades of Sudan 23 to left, Tift in center, and one of the Sudangrass-sorghum hybrids to right—showing typical damage from Helminthosporium leaf blight to these varieties as observed in San Bernardino and San Diego Counties.