Tulelake Durum Wheat Research Related By Calif. Farm Adviser

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Field experiments with durum wheat have been conducted in the Tulelake area during the past five years to determine the effect of irrigation and fertilization on the yield and quality of the wheat. The following are the results of some of the trials. It is interesting to note that 84 pounds of nitrogen coupled with a June irrigation resulted in maximum yield and a low chalk content of the durum wheat. The wheat protein as you will note was also influenced by both irrigation and fertilization. Many farmers have cooperated on this work the past two years. One of our larger trials was on Ed Seus' farm. Don Younker, Earl Parsons, Wesley St. Peter, Don Potter and the U.S. Fish and Wildlife Service have also cooperated by allowing us to conduct plot tests on their land.

Durum wheat was grown commercially for the first time in the Tulelake Basin in 1955. Prior to that time field experiments had demonstrated that the crop was adaptable to the Basin's short growing season. Experiments have also shown that the quality and yield of the durum wheat can be controlled through irrigation and fertilization.

Test plots conducted in the field have demonstrated that yields of durum wheat can be increased by both fertilizer and proper timing of irrigations. Quality can also be controlled, to some degree, by proper irrigation timing in maximum yields on all fertilizer trials.

Where no fertilizer was applied, a June irrigation resulted in equal yields to a June-July or a June-July-August irrigation. This is also true where 42 pounds and 84 pounds of ammoniacal nitrogen was applied to the soil, prior to planting time. In these fertilized plots, only a slight increase in yield was obtained over the check plots when no irrigation was applied.

Where irrigations were applied, each increment of nitrogen significantly increased yields, but the 84 pounds of nitrogen and the 84 pounds of nitrogen and 60 pounds of phosphate treatments were significantly better than other treatments. Since there was a significant irrigation x fertilizer interaction, indicating that both factors contribute to produce the highest grain yields, much of the increased yield from the timely irrigation is due to nitrogen fertilization. The single irrigation in June or multiple irrigations where the first irrigation application was made in June-July, June-August or June-July-August with nitrogen fertilization gave the highest yields. The maximum economic yields were produced with a June irrigation with the use of 84 pounds of nitrogen per acre.

The per cent protein of the durum wheat was affected by both fertilization and irrigation. Where no fertilizer was applied the average protein for all irrigation treatments was 10.99 per cent. Where 42 pounds of nitrogen was applied the protein was 11.12 per cent. Where 84 pounds of nitrogen was applied it was 11.80 per cent. The average protein on all fertilized treatments with a June irrigation was 12.30 per cent. The same treatments with a July irrigation gave 11.96 per cent and an August irrigation resulted in 11.22 per cent protein. A June-July irrigation gave 10.96 per cent and a June-August irrigation resulted in 10.16 per cent. Irrigating in July and August gave 12.16 per cent protein and a June-July and August irrigation produced an average of 11.65 per cent protein. These results show that a June irrigation coupled with 84 pounds of nitrogen or 84 pounds of nitrogen with 60 pounds of phosphate resulted in the highest protein values of durum wheat.

Excess chalky kernels (yellow berry), results in the lowering of the grade and milling quality of durum wheat. Here again, both fertilization and irrigation affected the amount of chalk in the durum wheat. The recommended June irrigation with no fertilizer, resulted in 34 per cent chalk. Where 42 pounds of nitrogen per acre was applied with a June irrigation, the chalk dropped to 9 per cent and only raised to 12 per cent where 84 pounds of nitrogen was applied. The June-July irrigation with no fertilizer gave 30 per cent, 42 pounds of nitrogen 33 per cent and with 84 pounds of nitrogen the chalk dropped to 8 per cent. A July irrigation with no fertilizer gave 12 per cent chalk while 42 pounds of nitrogen gave 13 per cent, 84 pounds of nitrogen resulted in only 7 per cent. An August irrigation with no fertilizer gave 32 per cent, 42 pounds of nitrogen gave 42 per cent and 84 per cent of nitrogen gave 17 per cent chalk. The July-August irrigation with no fertilizer gave 19 per cent, 42 pounds of nitrogen gave 21 per cent and 84 pounds gave 12 per cent chalk. It is interesting to note that where no irrigation water was applied and no fertilizer used the chalk content was 7 per cent, no irrigation with 42 pounds of nitrogen gave only 2 per cent while 84 pounds of nitrogen gave 9 per cent chalk. Undoubtably the irrigation of durum wheat, if improperly timed and applied, can increase the chalkyness of the durum wheat. Dryland durum plantings in the area have had less difficulty with chalkyness and low protein than the irrigated fields.

The results of these studies indicate that durum wheat quality apparently can be controlled by proper timing of irrigations. Yield and quality of durum wheat are both affected by irrigation and fertilization. Wheat protein was the highest where 84 pounds of nitrogen and 60 pounds of phosphorous was applied and the lowest where no fertilizer was used. A June irrigation resulted in the highest protein percentage of all other irrigation treatments. Chalky wheat kernels were held at a minimum with no irrigations, the June and July irrigations with 42 pounds and 84 pounds of nitrogen also resulted in low kernel chalk percentage. The highest chalk was in the August, June - July, June - August and June-July-August irrigations.

Many farmers have asked me about the use of foliar applications of fertilizers on cereals, legumes and potatoes. Because the requirements of plants for micronutrients (trace elements) is relatively small, these nutrients are suited to foliar applications.

However the probability of controlling nitrogen, phosphorous, potasium and sulfur deficiencies by foliar fertilization are less promising, these elements have been shown to be absorbed by leaves and readily translocated to roots and regions where rapid growth is occuring. The quantitative plant requirements for these elements is so much greater than for micronutrients that several sprays at a maximum safe concentration are required to bring about yield responses. Just how deficient the soil may be before one can expect a significant response to foliar-applied micro-nutrients has not been determined. Most experiment stations report that tests indicate that these levels are below those required for profitable production.

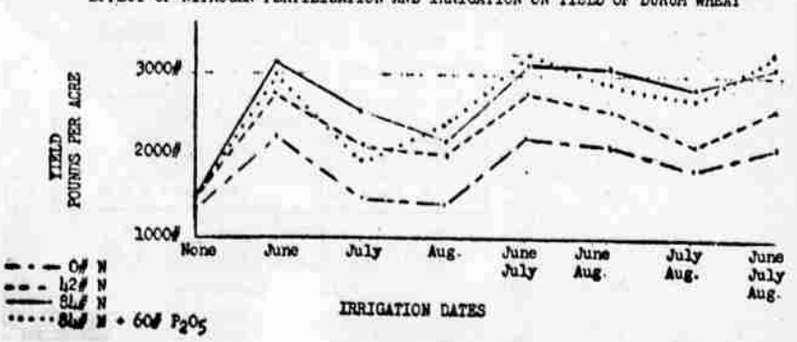
We are cooperating with Dick Falconer, Stan Buckingham and Dick Fuller in attempting to find out what gibberellic acid at five parts per million will do to netted gem potatoes. I treated the seed pieces and those farmers have planted this treated seed. We will attempt to discover any yield differences, specific gravity and quality of the potatoes, etc., on these trials this year.

"The difference between despair and hope is often a good nights sleep."

IRRIGATION TREATMENT — FERTILIZATION TREATMENT

	POUNDS NITROGEN PER ACRE				
	NONE	42# N	84# N	84# N + 60# P_2O_5	AVERAGE
	PERCENT PROTEIN				
June	11.04	12.77	12.79	13.03	12.30
July	11.85	11.85	12.39	11.75	11.96
August	10.73	10.55	11.84	11.78	11.22
June & July	10.76	10.41	11.29	11.38	10.96
June & August	9.75	9.75	10.58	10.89	10.16
July & August	11.61	11.59	12.33	13.14	12.16
June, July & Aug.	11.24	10.94	11.81	12.62	11.65
Average	10.99	11.12	11.80	12.08	

EFFECT OF NITROGEN FERTILIZATION AND IRRIGATION ON YIELD OF DURUM WHEAT



Parasite Toll Can Be Held

This is the time of year when farmers should be watchful against parasite problems in young farm animals which have just been weaned, according to a bulletin today from the American Foundation for Animal Health.

Some of these parasites, such as tapeworms, rob the host animal of the nutritional elements in feed. Others suck the blood of the host animal and cause anemia. Some parasites block small blood vessels or penetrate intestinal walls. Still others may damage the animals' livers or lungs.

In some parts of the country, liver flukes cause death losses or retard the growth of lambs and calves. Lungworms also may cause death or poor growth.

As preventive measures, foundation authorities suggested that livestock be kept away from old pastures, low swampy ground, stale ponds, unclean water tanks, and old barn lots.

A number of new medicines have been developed which are helpful both in preventing internal parasites and in treating infected animals. However, the foundation said they should be employed under veterinary direction, because some are dangerous if not properly used.

CHALK LINES

Lines drawn with a piece of tailor's chalk are easier to see than those made with a pencil when Masonite hardboards are being marked for cutting or layout work, according to Popular Mechanics magazine. Light-colored crayons also are excellent for such use.