

crop due to flooding, but enough good crops were harvested to give significant results. Duplicate 1/100 acre plots were dug by hand on each treatment and 6 sugar tests made per plot. The following were the results:

<u>Data on 3 Farms Using Sodium Sulphate in the Fertilizer</u>					Recoverable
<u>Treatment</u>	<u>Stand</u>	<u>Tonnage</u>	<u>Sugar</u>	<u>Purity of Juice</u>	<u>Sug. per Ac.</u>
Boron in 2-16-6	86.3	10.75	15.2	85.5	2770
Sodium in 2-16-6	85.6	10.19	15.1	84.8	2551
2-16-6 Alone	83.6	10.07	14.8	85.1	2501

<u>Data on 3 Farms Using Mineral Colloids as a Fertilizer</u>					
Boron in 2-16-6	77.0	10.79	14.6	84.9	2612
Mineral Colloids	75.6	8.54	14.5	85.2	2044
2-16-6 Alone	71.3	10.18	14.2	83.7	2382

<u>Data on 5 Farms Using Boron, Manganese, Copper, etc. in the Fertilizer</u>					
Boron in 2-16-6	81.8	10.63	14.62	85.3	2609
Sodium in 2-16-6		(10.19)			
Manganese in 2-16-6	81.2	9.71	14.54	85.4	2366
Copper in 2-16-6	78.8	9.52	14.72	85.4	2339
2-16-6 Alone	77.0	9.95	14.14	84.7	2355
Peters' All-N-One	80.8	9.01	14.24	84.8	2135
Mineral Colloids		(8.54)			
Diff. for					
Significance	5.6	.64	.60	1.2	206
Significant Treatments	none	Boron above Peters' below Min.Coll. "	none	none	Boron above Peters' below

It is apparent that Sodium, Manganese and Copper Sulphate had only a slight effect upon the beet crop and showed no significant gain.

Boron did increase the yield significantly in these tests as to tonnage, but not in sugar or purity of juice.

The Peters' All-N-One fertilizer and Mineral Colloids were significantly below the standard 2-16-6 as to tonnage without having any significant effect upon other factors.

SUMMARY OF RESULTS OF FERTILIZER TESTS CONDUCTED FOR THE LAST TEN YEARS AT THE DOMINION EXPERIMENTAL STATION LETHBRIDGE, ALBERTA, CANADA

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Tests have been made with Phosphatic Nitrogenous and Potassic fertilizers on irrigated sugar beets since 1927. Phosphates, both triple-super and ammonium phosphates have increased yields in every test and on almost every individual plot where they have been applied at the time of seeding. Nitrogen applied at time of seeding has increased yields in most trials but not always and the yield increases usually have not been as great as have been secured with phosphates.

Potassium has not given significant increases on these glacial soils which have a relatively high but not injurious amounts of water soluble salts, principally sulphates of calcium, sodium and magnesium with some potassium.

Ammonium phosphate has given better response than Triple-sugar phosphate in comparative tests and is used extensively by farmers.

Applications of 60 to 100 pounds of Triple-super phosphate or Ammonium phosphate directly with the seed has depressed germination and early growth when there was a deficiency of moisture but the use of a drill shoe that places no more than 20% of the fertilizer with the seed and the balance in bands about $3/4$ inch from the seed on each side has been definitely satisfactory and is used over the entire district for field plantings.

Applying fertilizer with a grain drill before seeding or side applications during the growth period, has not been promising in the few tests made with these methods, but plowing phosphates under with barnyard or green manure in the fall preceding planting has given indications of profitable increases in yields.

In rates of Application tests, yield increases have been indicated with increased amounts of ammonium phosphate up to 200 pounds per acre applied near the seed, but greater yields secured with applications exceeding 100 pounds have not been considered sufficient to justify using higher rates. Farmers are using 60 to 100 pounds per acre and almost all fields have phosphate applied at time of seeding.

It is thought that the almost invariable increase in production secured from the application of a soluble phosphate at time of seeding is associated with the depressed organic activity in the soil during the cool spring period and the resultant slowness with which fixed phosphorous is made available to plants.

SUMMARY OF 1937 FERTILIZER TESTS ON BEETS IN MONTANA

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Increased yield shown in the accompanying chart is the average increase found in the respective tests. The data indicate that there was no response to boron, copper, manganese, zinc or iodine. That is, when these elements were added to treble superphosphate there was no increase over fertilization with phosphate alone, as will be seen by comparing test No. 2 with tests 4 and 5. With other soils and other amounts of these elements the results might have been different.

In the case of complete fertilizer No. 6, nitrogen failed to show any beneficial results. Only 150 pounds of a 4-16-4 fertilizer was used. This is a very small amount of nitrogen and the writer believes it to have been lost by early irrigation. Symptoms of nitrogen deficiency were evident in all fields throughout the summer.

A very poor response was shown in the three tests with H_2PO_4 in irrigation water. The beets were 6 to 8 weeks old at the time of fertiliza-