

RESEARCH REPORT

Sugarbeet Conference, Fort Collins, Colorado

February 5 - 7, 1974

Prepared by G. J. Hogaboam, Research Agronomist, January 15, 1974

- A. Location of Project: North Central Region
Lafayette Area
Michigan State University
East Lansing, Michigan 48823
- B. Work Reporting Unit Title: Sugarbeet Production Practices
- C. Work Reporting Unit: 401-3309-10710
- D. SMY's for Past Year at Location: 4 SMY
- E. Names of Scientists in Project at Location:
G. J. Hogaboam, Research Agronomist; C. L. Schneider, Plant Pathologist;
F. W. Snyder, Plant Physiologist; R. C. Zielke, Research Agronomist
(resigned 1 July 1973)
- F. Mission of Research:

To increase the production efficiency in obtainable sugar from the sugarbeet. To develop better varieties and improve production practices. To better understand the sugarbeet diseases and the best method of their control. To better understand the physiological barriers to efficient sugar production and determine the best possible means of removing these barriers.

- G. Objectives of Research:

To consistently produce high yields of recoverable white sugar per acre. Obtainment of these objectives is dependent upon, but not limited to the following:

1. Higher yield of roots per acre.
2. Higher extractable white sugar per ton of roots (high percent sucrose, high clear juice purity).
3. Resistance to Aphanomyces cochlioides (both seedling and chronic phases).
4. Resistance to Cercospora beticola leafspot.
5. Resistance to Rhizoctonia species causing crown and root rot.
6. Monogerm seed which will emerge rapidly and uniformly.
7. Roots which can maintain a high quality in the factory storage pile.
8. Roots with a low fiber content.

- H. Research Accomplishments:

1. Average yields of sugar per acre have more than doubled since 1948.
2. Monogerm hybrids were developed to replace Multigerm varieties.

3. In 1973 the commercial variety of the 1950's (US 401) was compared to the present commercial variety (US H20) in six trials. US H20 had 21% greater recoverable white sugar per acre than US 401. The improvements in US H20 compared to US 401 were: 17% in root yield, 5% in pounds recoverable white sugar per ton, 2.5% in sucrose concentration, 1.3% in clear juice purity, 17% in leaf spot rating, and less root fibers.
4. An x-ray technique was developed to examine the sugarbeet seed within the intact fruit.
5. Techniques have been developed to collect and store sugarbeet pollen. Some pollen has been viable after 5 years of storage.

I. Impact of Research Accomplishments on Science and General Public:

1. The resistance to black root (Aphanomyces cochlioides) and to leaf spot (Cercospora beticola) incorporated into US 401 and subsequent varieties enabled farmers and factories to again grow and process sugarbeets profitably in the Eastern area of the United States.

J. Obstacles to Achieving Objectives:

Our offices are small, laboratories are overcrowded, and the Plant Physiologist and myself are in offices about a half-mile from our colleagues. Our root storage space and greenhouse space is overcrowded.

K. Future Plans and Needs:

Michigan State University is trying to secure financing from the Michigan Legislature to build a new Plant-Soil Sciences building which would include us. It would be 5 years before we could move in if this proposal is granted. The three professional men on this Project are all about the same age and will be eligible to retire within a few years. Some young professional men should be added to the program as space and finances permit.