

Status of Spring Mechanization in the Michigan Area

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The increasing shortage of satisfactory labor and the constantly rising costs pertaining to it make it imperative that some means be devised and used to reduce the amount of labor required to block and thin sugar beets and the cost of growing the crop. This is emphasized in the eastern beet area where labor sources are at a greater distance, causing high transportation costs.

There are several approaches to the reduction or elimination of labor which are available. Some of them are:

1. Use of monogerm seed.
3. Better methods of seedbed preparation for improved emergence and fewer weeds.
3. Improved methods of planting and use of fertilizer.
4. Chemical weed control.
5. Use of mechanical devices to control weeds and obtain the desired stand of beets.

It is obvious that one, or any combination of these approaches, would aid in achieving our goal—**elimination of spring labor**. If we had commercially available monogerm seed, space planting and positive chemical weed control, it is conceivable that our goal could be accomplished. Although there are some encouraging results along these lines of research, there are none which are 100 percent effective when used in the field. Until such time as these approaches become perfected, it is imperative that the best use be made of the best means available at present.

In the Michigan area, we are concentrating our efforts toward the use of a down-the-row thinner using the principle developed by the Great Western Sugar Company and commonly known as the "Windsor System" (1)². A very comprehensive and intensive educational program is being followed with selected growers and the fieldmen who serve them. The actual operation of the machine is carefully supervised and a company representative works directly with each chosen grower during the entire operation. Parts of each field are unworked so each farmer and his neighbors can see and compare the results accomplished. The following year different growers are selected and the program repeated. The number of these growers is held down to where it is possible to give each one the attention and assistance necessary to accomplish the job.

The machine used is the standard 4-row trail type. However, it is modified so that it is attached to the rear of the tractor and operated by means of the tractor hydraulic system. The unit remains ground-driven.

In conjunction with this program, we are continuing research in an attempt to develop machines which may do the same job easier and better.

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² Numbers in parentheses refer to literature cited.

In 1953, we tested a simple variable speed, counter-rotating, double head machine based on the principle developed and described by George W. French (2).



Figure 1.—A variable speed unit attached to a John Deere "40" tractor for powering a dual head, counter-rotating, 4-row beet thinner.

The variable speed unit is standard for all makes and models of tractors having power take-off assemblies. This unit is fitted to various models by bolting to a plate which will in turn fit a given model tractor. See Figure 1.

The individual counter-rotating, dual head gear boxes are all standard and are attached to a cultivator bar by means of regular clamps. Interchangeable mounting brackets are used for varying types of clamps and cultivators. Depth control is obtained by means of standard cultivator bar depth gauge wheels. See Figure 2.

There is an indefinite number of combinations of size and number of teeth which may be used on one or both heads. The variable speed unit will alter the speed of the rotating heads from a cut every six inches to a continuous cut in which everything may be taken out. Further changes in speed may be accomplished by shifting gears of the tractor.

It is possible to use one head with small teeth (16-tooth- $\frac{1}{2}$ inch) and completely thin beets once over the field. Under good conditions, labor savings up to 82 percent have been obtained. Further extensive tests are planned for 1954 before this machine will be recommended for large scale use.

In order to avoid confusion in having "lefts" and "rights" in teeth, depending on the direction of rotation, a new type tooth was designed. This tooth works equally well regardless of the direction it travels. The teeth shown in Figure 3 were made up for preliminary testing. An improved type will be manufactured this year. Subject to further testing, it may be possible that only one size and shape of tooth may be necessary for the thinning operation under varying conditions when used with a



Figure 2.—A dual-head, counter-rotating beet-thinning unit. Note simplicity of attachment to cultivator bar and depth control.



Figure 3.—A beet thinning head showing the "universal" tooth which operates well regardless of direction of rotation.

variable speed thinner. Excellent results were obtained in 1953 using this "Universal" tooth followed by the spring tine teeth going in the opposite direction on the second of the dual heads.

This machine is very simple to mount and remove from any tractor. Four bolts hold the variable speed system and cultivator bar clamps hold the thinning units. There is ample room on the cultivator bar for cultivating tools if these are desired. The thinner is being manufactured by the Palsgrove Manufacturing Company, Canal Winchester, Ohio.

Literature Cited

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