The Agricultural Executive Looks at the Future of the Beet Sugar Industry[1]

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I appreciate the great honor and opportunity to represent Agriculture during this General Session of our Society. The importance of this subject and scope of the material to be covered is so large and diversified that I felt it would be impossible for me to give an intelligent forecast of the future without some help. I, therefore, contacted some of my agricultural associates from each major beet-growing area and asked them to assist by expressing what they think the future of the beet sugar industry will be.

Before predicting what is going to happen, however, lets take a few moments and discuss some of the tremendous accomplishments that have been made by the sugarbeet industry in the last thirty years. Undoubtedly one of the most important discoveries in the first half of this century was monogerm seed. Its climb to almost 100 percent usage at this date has been spectacular. The way our scientists have bred into it increased tonnage, disease resistance, and at the same time maintaining sugar levels, indicates clearly that the calibre of our plant breeders is of the highest order.

When I started as a fieldman in 1937 it was quite common for the grower to advise you that he was putting one bag of 2-12-6 fertilizer to the acre. Although this was 125 pounds, you are all aware of the terrific change in the use of fertilizer today. Not only have the amounts per acre been increased but the analyses are more tailored to individual field requirements. The use of nitrogen has been a highly controversial subject. In general, it has helped produce more sugar per acre when properly used. Excessive use of it, however ,has been a factor in lowering quality. Fortunately this has been realized and seems to be in check in more recent years.

The tremendous and rapid growth of today's pesticides are well known by all. In regards to fungicides they appear to be well in hand. Insecticides are still a question mark, however, due to bothersome residues. We have some excellent herbicides,

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but I will mention later what is required in the future in this regard.

In the old days when we sowed whole, multigerm seed at 15 pounds to the acre, some years every seed grew. The labor requirements and the job of blocking and thinning under those circumstances cannot even be visualized by some of our younger members today. The discovery of segmented seed, subsequent refinement of processing techniques, and, later, the advent of monogerm seed, has greatly reduced the amount of labor required. The job of thinning the beets is now much easier for everyone. Fewer people are thinning more beets than ever before, but people are still required.

The topic of machinery is difficult to cover properly in the time allotted. When one considers, however, the millions of dollars that specialized beet growers have invested in new drills, mechanical thinners, power cultivators, harvesters, special beet wagons and trucks, and many other items too numerous to mention, the change in beet machinery is quite impressive. When I started with our Company 31 years ago, every beet was pitched on to either wagons or trucks by hand and unloaded in the same way. Our first Silver piler was not purchased until 1942. Naturally we are and have been one hundred percent mechanized for receiving beets for many years. If a trucker, however, comes in today with a broken hoist and we have no other facility for unloading him other than pitching off, he stares at you in horror.

I only intend to touch briefly on the tremendous changes in our factories but they also are very significant. As fast as they can, companies are increasing their efficiency to lower the cost of processing. Some of these changes are storage silos for bulk handling, continuous diffusion, juice purification, liquid sugar, and great strides in automation with sophisticated instrumentation control.

The growth of our industry has been tremendous, particularly in certain areas. There have been several new factories opened in the last few years. More are planned and some under construction at the present time.

In times of low sugar prices, particularly in Canada, we, as an industry, have only been able to survive by increasing our efficiency both on the farm and in the factory.

In spite of this remarkable growth and record, we, as an industry, do have some immediate problems.

The first of these is to continue our never-ending struggle for the reduction and eventual elimination of hand labor in the spring. This can be accomplished by better emergence of seed and more effective herbicides. We probably require a stopgap

of improved electric-eye or other selective thinners. Secondly, although the quality of our beets has increased slightly in the last two to three years, due principally to better knowledge of how to use additional nitrogen, and improved factory performance, we still require help to further improve in this area. Thirdly, we must find some way to reduce our beet storage losses and reverse the trend of declining extraction. In the future these factors will be aggravated by rapid delivery and longer storage periods. Fourthly, by resolving the above problems we will automatically improve the net cash return to our growers in order to keep them interested in producing sugarbeets. Of course, the processor has to make money also, or the industry folds.

I now come to the point where my associates and I will try to predict the future of agriculture in relation to the beet industry. This has been broken down to several subtitles, which are as follows:

SEED—Almost unanimously it was predicted that future seed will be true hybrid monogerm varieties selected and adaptable to specific areas. They will carry genetic factors for even greater sugar per acre and stronger disease resistance. Our seed will be larger and emerge better. The rate of seeding will be reduced, and seed will be of a much more uniform size either due to refinements in processing, or coated (pelleted) for the same purpose. It is interesting to note that in Manitoba they have patented a process covering seed with a plastic cover for early sprouting in the spring. It will be planted the previous fall and may include pesticides, and nutrients. We will all watch this new technique with great interest.

FERTILIZER—Individual fields will be soil tested to determine specific requirements for each particular need. Leaf or petiole analyses will be common. There will be a greater use of minor elements. The use of nitrogen will still be common from several sources but the danger of over use and wastage will be guarded against. The fall application of fertilizer will continue to increase, followed by pop-up or starter fertilizer in the spring. In the irrigated areas, the application of fertilizer through sprinklers, as well as the use of more liquid fertilizer, will increase.

SOIL TILLAGE—Everyone recognizes the advantage of early planting and this will affect the method of tillage in the future. On the heavier ground the land will be plowed and partially worked in the fall. If you cannot fall plow, due to a season like 1967, some real heavy ground will not be plowed,

but just disked and planted. Minimum tillage, where practicable, will increase and surface tillage, particularly in some of the new areas, will become increasingly important. Every effort to preserve moisture will be exploited. It will be necessary to plow to dilute the effect of pesticides from the previous crop in concentrated cash crop areas. Improved and refined tillage implements will continue to play an important part in working the soil.

METHOD OF PLANTING—Everyone agrees that eventually our beets will be space planted and left untouched. This, of course, will be combined with the proper use of ideal herbicides, but it can and will be done. Row widths, wider than 24 inches, will decrease, and population of beets per acre will increase. With stronger seed it will be practicable to plant deeper to the moisture, although planting rates will become lighter. In both the east and west, scientists are now investigating the possibility of a brand new concept of planting. A single seed placed in a measured quantity of vermiculite and only working that small area rather than the whole field is their goal to completely eliminate thinning. Of course, again a tried and true herbicide will have to be part of this program.

IMPROVED DRILLS—Our present day drills are good and, if operated properly, do a creditable job. As our seed becomes larger and stronger and more exact in size, we will have more precision requirements. The possibility of power ejection of this seed and better depth control will come. Multiple rows, including 8 and 12 rows, will be common where practicable, and improved press wheels will prevent capping or crusting.

USE OF CHEMICALS—This is such a wide-ranging subject it is impossible to concentrate all facets of it into the time available to discuss it. There is a general increase of weeds on some farms due to poor culture, particularly in the previous crops. Growers will learn to control these weeds better and a more dependable broadleaf herbicide will make its appearance. We will have a herbicide as common and as good as the dramatic breakthrough of corn weed control with the use of 2,4-D, and today's atrazine. Postemergence weed control will be more common than preemergence treatments when the above chemical arrives. The price of these herbicides will be cheaper and the results more satisfactory. Soil testing for amount of chemical required will be used.

New insecticides and fungicides will appear fairly rapidly since there has been a ban on the use of several former good materials, due to chemical residue. More use of systemic ma-

terials will be common, and there probably will be a breakthrough in nematode control by chemicals.

CULTIVATION—With space planting and better weed control there will be less cultivation required. Some people predict there will eventually be no cultivation as the control of weeds is the prime function of it. In the meantime, as the planter grows in width, so will the cultivator, and there will be an increase in the use of rolling cultivators. Cultivation, when required, will be more precise. Until the miracle herbicide appears it will still be a very important part of our beet culture.

MECHANICAL THINNERS—When planting to a stand becomes common with better weed control, the use of thinners will probably be eliminated. One of my friends says they will be put in the museum. Until then, sophisticated selective thinners will appear, in spite of the high cost, and will become common. In the interim, the present day thinners will continue to slowly increase in use. However, when planting to a stand becomes a reality, all mechanical thinning operations will likely disappear. As in the case of many of our present day practices, there will be a breakthrough. In parts of the country where they have very large acreages the use of the spring-tine harrow, unique in its large area coverage and simple adjustment, will remain popular.

HARVESTING EQUIPMENT – HARVESTERS—Multi-row harvesters with efficient cleaning beds will be universal. Three-row machines will be common and with greater power 4- and 6-row machines will be used. As the sugarbeet will be more uniformly topped and cleaned in the field there will be less trash at the receiving stations. With individual sugar tests the growers will continue to be reluctant to start their harvest until the beet has a good sugar content; therefore, future harvesters will be geared to a short season. **TOP SAVERS**—The use of tops will grow. Their value in Europe is well known. More growers will make every effort to save the tops, particularly the average and below average growers who will require more net returns per acre. In some areas the natural drying and baling of tops will increase.

DELIVERY OF CROP—In most districts the beet has to be out of the ground before freeze-up. Aggravated by slow starting, wide-open delivery will be necessary. When the storage conditions are right the Company must be ready to receive them. Scales will be open 24 hours a day; trucks will get larger, receiving equipment will be updated with wider and larger cleaning rolls for faster unloading. The use of computers and electronic

scale equipment will be common. The number of receiving stations will diminish.

All possible means to reduce loss in storage will be tried. Eventually we may see large enclosures with controlled temperatures for proposed long-storage piles. Possible irradiation of beets to inhibit sprouting is not beyond our reach. Experiments are being done now towards this end.

GENERAL

Agricultural Research—Only by greater production and improved efficiency will the sugarbeet industry realize its full potential. As production and efficiency are by-products of research, it is essential that this area of work should be continued. It has been stated that "As a company's research program goes, so goes that Company." More emphasis and a greater challenge will be thrust upon agricultural research to bring about the above predictions. More money will be spent and there will even be closer co-operation with the United States Department of Agriculture, state universities, societies, foundations, and such institutions as the Sugar Research Advisory Committee. Special efforts will be geared to continue increasing sugar per acre. Better storage and extraction will be a reality. New varieties of seed will appear and beets will process better.

There is still too much time lag between research results and practical application in the field. Upon checking my report of two years ago, and even older papers, some of our same problems with suggested alternatives were mentioned as requiring immediate action.

We must step up and streamline research activities and diligently make valid interpretations of the results.

Future of Labor—There is a division of opinion on this subject. Some of our agriculturists feel that there will always be a need for some labor, although less common labor will be required. Others still feel that with the combination of space planting and a sure herbicide, hand labor will be completely eliminated. Some believe, that even if labor is available, growers will not be able to afford to pay it. I believe the answer is that we will go through a transition period of less and less labor while many growers each year will learn to become completely independent of expensive hand labor.

Irrigation—Although overhead irrigation is costly, this method will rapidly develop in areas that require water. The availability of water is still the key but there will be more efficient use and less waste as the supply becomes scarcer. Labor for irrigation will be more difficult to get. The combination

of fertilizer and irrigation will increase as in some areas it is a natural.

Where regular irrigation is now being used, greater use of concrete lined canals, aluminum supply lines, syphons, and gated pipes will be used. Fall irrigation to speed residue plow-down will become a common practice.

Future Trends—As farms get larger, so will beet contracts. Future beet growers will become highly specialized with key personnel responsible for production of the crop.

Company and Government information meetings will increase as will the demand for specialized publications and technical information.

Summary and Conclusion

There have been tremendous strides and changes accomplished in the agricultural production of sugarbeets during the last thirty years.

The future looks very promising. Some think we are just entering the new era of reduced labor requirements. We must not become complacent, however, because factories can close. Lack of acreage and lack of profit, both of which we personally have experienced recently, are the major culprits.

If I were asked today "What is required to ensure the future of this great industry?" I would say this. First, we must find the answer to complete elimination of hand labor. This can come with better emerging seed and surer herbicides. Secondly, we must strive for higher quality. In agriculture, this means improved varieties, better culture, and less storage losses. In the factory it means more efficient processing. Thirdly, both the grower and the processor must increase their profits or the future is in jeopardy.

Our industry has a remarkable history of survival. One crisis after another has failed to permanently suppress it.

In spite of our present experience recently of having our factory close, we still predict a great future and continued growth of this industry.

Companies should heed the warning signs, however, and put their own house in order so that similar catastrophes will not strike them. In Ontario our agricultural and factory performance were considered among the most efficient in North America. We could not survive, however, because of our economic environment largely due to extremely low refined sugar prices.

I believe the long-sought-for time of growing beets without hand labor is within our grasp and will be here soon.

This great Society can and must continue to give strong leadership to solve our immediate problems.

Agriculture is responsible to produce the raw product for our factories. The most modern up-to-date multi million dollar plant cannot run without beets. It is therefore very essential that agriculture and factory personnel should unite as a strong team to ensure the preservation of this wonderful Industry.

I know that I speak for all agricultural personnel when I say they are ready to do their part to help their companies stay healthy and make a fair profit. I am sure they all look forward to the new era and future with eagerness and confidence.