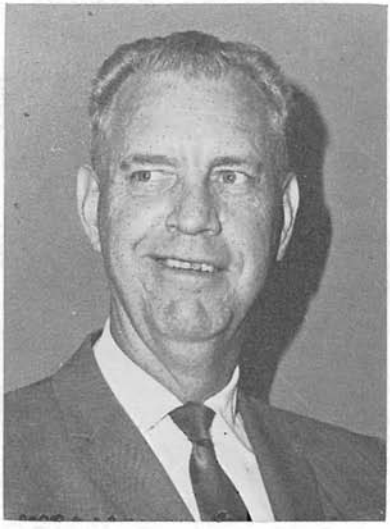

LLOYD W. NORMAN

President for the American Society of Sugar Beet Technologists for the biennium 1970-71 is Lloyd W. Norman. Mr. Norman is Operating Research Manager, Utah-Idaho Sugar Company, Moses Lake, Washington.

Presidential Address

GEORGE E. RUSH[1]

Mr. Chairman, distinguished guests, ladies and gentlemen, as President of the American Society of Sugar Beet Technologists, it is both a pleasure and an honor for me to welcome you to the 16th General Meeting of our Society. In addition, I welcome this opportunity of reporting to you on the status of your society and on the actions taken by your executive since our meeting 2 years ago in Phoenix.

Your Society has continued to grow not only in numbers but also in stature. After careful deliberation your executive took action to increase the biennial dues of both individual and corporate members. This was done, not only to bolster the immediate financial resources of the Society, but also to assure continuity of essential services and to permit the Society to continue its development independently, if necessary, of outside financial support. Other amendments to the constitution were proposed and approved to meet the changing needs of the Society. These changes to the constitution and bylaws will enable your society to function more effectively and better serve the needs of members. Other matters relating to the conduct of the society's affairs have been considered by your executive and will be presented and discussed at the business meeting which convenes at the conclusion of this general meeting.

In reviewing the society's affairs over the past 2 years, special mention must be given to the holding of the Third Joint Meeting of the IIRB and the ASSBT in Europe last June. Your society was well represented at these important meetings which provides an opportunity for members of both societies to exchange ideas and to see first hand how problems of mutual interest are being resolved.

The task of organizing joint meetings is indeed formidable and I should like to commend our Secretary and the Special Committee organized to handle the arrangements for a job well done. Also, on behalf of the Society, I wish to convey our thanks and sincere appreciation to the IIRB for hosting these meetings and for the gracious hospitality extended to ASSBT delegates on this occasion.

We are privileged to have with us today several delegates from the IIRB. We welcome them to Denver and appreciate their participation and contributions to the exchange of technological information at these meetings.

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At this point I would like to congratulate our Program Chairman and his committee for the excellent job they have done in arranging our program. You will have noticed that in all sessions greater time has been allowed for discussion of papers presented, which is in response to the need for better communication among technologists working in related fields of research.

The various committees in charge of convention arrangements have also done their jobs well. Their attention to detail, enthusiasm and hospitality have been experienced by everyone in attendance.

I would now like to talk about priorities for research and the need to create a climate for total commitment to the solution of these priorities.

We, as the technologists of our industry, have the very great responsibility of providing leadership, direction, and solutions to the technological problems that confront our industry. A review of the history of our industry reveals many technological achievements which have permitted the industry to overcome serious economic problems. Most of these accomplishments are well known and they have been reviewed adequately on previous occasions. We can indeed be proud of these accomplishments and the contributions made by technologists to the growth and development of our industry.

The size and scope of our program, however, attests to the fact that a large number of technical problems remain to be solved. In addition, we have been told by industry leaders that we must now become appreciably more efficient in both the production and processing of sugarbeets if our industry is to remain competitive and prosperous. The need to substantially increase efficiency on the farm and in the factories is the challenge that we as technologists face today.

I do not believe there is much to be gained by belaboring this point. It is recognized and acknowledged throughout the industry. I do believe there is something to be gained if we stand back and look at the major areas of our industry's operations that contribute most importantly to restricting its present levels of efficiency. What are the major limiting factors to increased levels of efficiency? What can be done to eliminate them?

Viewed in this way, it is apparent that three primary factors contribute most significantly to limiting the level of efficiency attainable by our industry today. These are:

1. Low net extraction of sugar entering the factories;
2. Major losses that occur in handling and storing beets;
3. High spring labor costs on the farm.

It is of interest, but little comfort to note, that all three of these conditions have been of concern since the very beginning of our industry. Obviously, solutions to these problems have not, and will not, be easy to come by. The magnitude and complexities of these problems are indeed formidable, but I believe, as technologists, we must now accept and dedicate ourselves to the challenges these problems offer. Certainly a solution to any one of these problems will be less spectacular than some earlier accomplishments, but the contribution a satisfactory solution to any one of them would make to the economic well being of our industry would be equally important.

People interested in plant operations have always been concerned with extraction problems and with the fact that so much sugar entering the factories ends up in molasses. This sugar that ends up in molasses is the major cause of the current unsatisfactory levels of efficiency that prevail in our industry today.

Many improvements have been made in factory operations — particularly in recent years — which have contributed both to improved operating efficiencies and to higher extraction levels. These accomplishments, however, are relatively small when measured in terms of the total loss in extraction represented by sugar entering molasses. The need to find practical and economically feasible systems that can effectively recover the sugar that now enters molasses is a critical first step if we are to achieve significantly higher levels of extraction and efficiency in our factories.

Opportunities available through the use of ion exchange systems offer possibilities of recovering virtually all of the sugar now entering molasses. In spite of their high capital costs, specific resin, regenerant and waste disposal requirements, efforts to develop and install suitable ion exchange systems are required if major improvements in extraction are to be achieved.

Unfortunately, ion exchange systems — like conventional processing systems — must also contend with the nonsugar loads entering the factories. The total nonsugar load, as well as certain specific individual nonsugar constituents, importantly affect operating costs and levels of extraction attainable in the factories. These nonsugar constituents are the end result of conditions and practices that prevailed during the growing, harvest and storage of the crop. To the extent that nonsugars in beets are present, change in volume, or vary in composition, is beyond the control of the operating departments.

Today most agriculturists recognize that they have the knowledge and capability to exert considerable control over the

quality of beets delivered to our factories. Very complete information is available to show that with proper management of the crop, high yields of good quality beets can be produced in all of our beet growing areas. Differences in growing seasons, prevailing weather conditions, and rainfall account for the characteristic differences in yield and quality levels attainable in different beet growing areas. However, within these limitations, proper crop management could result in a significant improvement in the general quality of beets produced and delivered to our factories.

In too many cases, however, this information is not being utilized because existing contracts do not compensate growers adequately for the additional effort required to strive for high quality in addition to high tonnage. For this reason no real effort is being made to up-grade the quality of beets being produced nor is sufficient concern being registered by growers for the decline in quality caused by the use of excess amounts of nitrogen fertilizers.

In view of the recognized importance of high quality beets to efficient factory operations, we must revaluate the economic considerations underlying existing beet payment schedules. Certainly our beet contracts do not now provide sufficient incentives to justify the importance we ascribe to beet quality in factory operations. Moreover, what we do and what we say about beet quality appears to reflect opposite poles of judgement.

I am convinced that before the industry can expect any improvement in beet quality an acceptable method must first be developed for combining appropriate incentives for high quality with adequate penalties for low quality beets in order to justify and stimulate the production of higher quality beets. If this cannot be done, our factories must be prepared to accept and handle even higher nonsugar loads in the future and we must stop expecting growers and our agricultural department to deliver higher quality beets.

The second area of improvement required in order to raise substantially our general level of efficiency is to reduce drastically the losses that occur in receiving and storing beets. Apart from the direct losses that occur in storage, degradation products arise from the breakdown of sucrose in storage which contribute importantly to the nonsugar loads entering the factories. The direct loss of sugar, together with the resulting additional nonsugar constituents caused by the presence of degradation products combine to make storage problems the second most important factor limiting the overall efficiency of the industry's operations.

The conditions under which beets must be stored in different beet growing areas vary widely. The conditions required for satisfactory and prolonged beet storage, however, are well known. By means of controlling storage environments, beets can be kept in excellent condition throughout existing storage periods. Materials and means are now available that permit a high degree of control to be exercised over storage environments. These relatively recent developments provide the opportunity to reduce significantly the large storage losses that normally occur in our industry. During recent years more progress has been made in this direction than has been accomplished in the entire history of the industry. Much more needs to be done to provide more precise control of storage environments and to extend the concept and practice to areas of production not now using them.

With regard to the third area of cost reduction and improved efficiency — namely, the reduction of high spring labor costs on the farm — we have made remarkably little progress even with the widespread introduction and use of monogerm seed. This is not to say that we have not progressed with respect to reducing seeding rates and the need for stoop labor. But we still do not have an acceptable program for mechanical stand reduction and the elimination of labor in thinning beets. The continuing need for, and high cost of, labor to thin or trim beets in the spring is the single most important manageable factor affecting the cost of sugarbeet production.

In most beet growing areas random mechanical thinners have not been accepted by growers. A wide variety of these machines have been developed and sold in all beet growing areas over the past 20 years. None has been universally successful and none is in general use today. I believe we can all accept the fact that random mechanical thinners are not the answer to this problem.

An examination of the reasons why these machines have failed to win acceptance may be useful in seeking alternative solutions. It appears that they have failed for three basic reasons:

1. These machines were designed to operate in uniform stands of closely spaced beets. These conditions rarely exist. Moreover, it is quite unrealistic to expect uniform stands of beets in any field year in and year out.
2. The advent of monogerm seed has resulted in a trend towards lower seeding rates which tend to increase the percentage of stands that have marginal initial stands. The use of random mechanical thinners in areas of marginal initial stands removes too many beets in these areas of the fields making the unacceptable final stands.

3. Random mechanical thinners are relatively inflexible in their adjustment and adaptation to the stand variations. They are just not flexible enough to meet the requirements needed to do an acceptable job of reducing stands.

Too often the variation in plant population that exists in beet fields at emergence remains after the mechanical thinning operations have been completed. The total plant population has been reduced but the initial variation in stand remains. I believe it is this resulting variability in stand more than any other single factor that has limited the acceptance of random mechanical thinners.

Electronic thinners, on the other hand, are designed to operate in and to thin irregular stands of beets. These machines can adapt readily to the wide range of emergence patterns normally found in beet fields. In addition, to operate effectively, electronic thinners require certain specific refinements in cultural practices which are conducive to optimum sugarbeet production. Smooth seed beds, space planting and weed-free rows are essential for effective operation of these machines and are beneficial for the production of sugarbeets.

At the present time, electronic thinners have several important drawbacks. They are expensive and sophisticated pieces of equipment and require further development in order to meet the requirements of acceptable field performance. Nevertheless, it appears that the development of electronic thinners and their use on a custom basis offer a real opportunity to achieve effective spring mechanization.

As in the case with factory operations, growers face rising production costs. Available data show that growers have not benefited from the introduction and use of monogerm seed in terms of reduced thinning costs. In fact, thinning costs on a per acre basis have increased steadily since the introduction of monogerm seed! On the other hand, labor has been able to thin more acres per man per day and companies have been able to reduce the number of migrant laborers imported per acre of beets contracted. It is truely ironic to realize that growers who were expected to benefit the most from the development of monogerm seed have benefited the least, and that the introduction and use of monogerm seed has not resulted in reducing thinning costs!

In relating these priorities for research to you, I am sure I have not said anything that you are not already aware of. What

we must do now then is to dedicate our efforts to finding solutions to these major problems that severely limit the level of efficiency attainable in our industry.

The effective solution of these complex problems will certainly require that we first of all create the necessary climate for total commitment of all of our people to their solution. Management must fully support and provide the strong leadership that will be required. Specialists in all appropriate disciplines will have to be brought together to consult, plan, and define the scope and direction of the research efforts to be made. With such an approach, starting at the top and permeating throughout the research organization of our industry, strong leadership and total commitment can be developed which will insure the success of efforts to solve these important problems.

Before closing, I would like to express my personal appreciation to our secretary and his staff, to the Directors of the Beet Sugar Development Foundation, to the management and staff of The Denver Hilton Hotel, and to all who have participated in our program, particularly the section and session chairmen and the members and guests who have prepared papers for presentation at the various sessions.

Our Society and its members have a very unique quality of working together and sharing research information freely. I challenge all of you to continue to work together to improve and develop the Society and in doing so provide the solutions to the technological problems that confront our industry.