

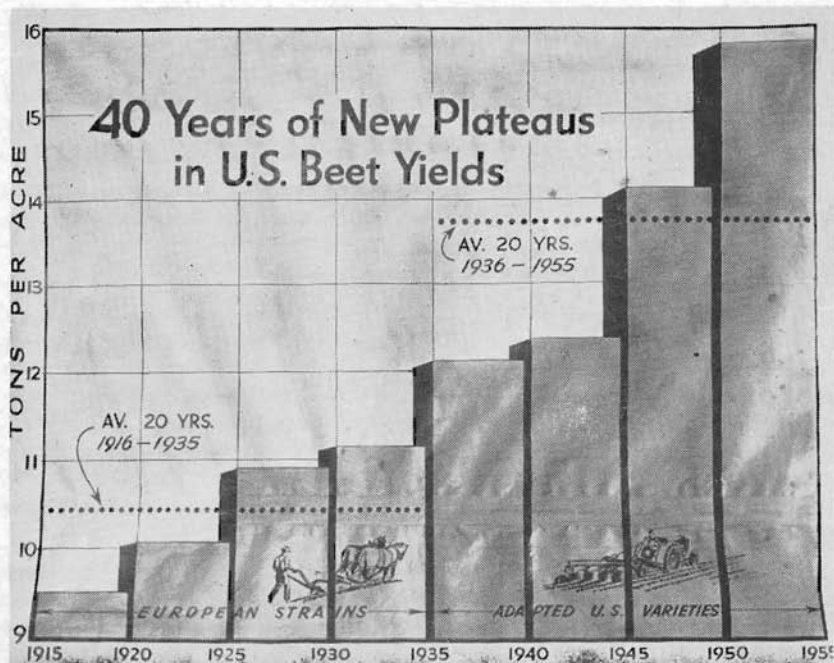
Old and New Plateaus

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Just twenty years ago on January 31, a small group of men interested in sugar beet research sat down in what was then called "the second annual round-table discussions," in Fort Collins, Colorado. This group of 57 individuals formed the nucleus of your American Society of Sugar Beet Technologists which was formally started the next winter. From this small beginning has grown our present Society of 519 active members.

Largely through the efforts of members of our organization have come the tremendous advances that we have been privileged to see take place in the beet sugar industry. More progress has been made in the last twenty years than in all of the time since Achard recognized the commercial value of that wonderful plant of nature, the sugar beet, in Germany 170 years ago this year.

In no period of our sugar beet production record have we so much to boast about as in the progress obtained in the 1936 to 1955 period. For the 20-year period 1916 to 1935, when European varieties were used exclusively, the average beet yield was 10.4 tons per acre.² For the next 20-year period, 1936 to 1955, with American varieties coming into use, the yield was 13.7 tons. The difference is 3.3 tons, or a gain in yield of 31.7 percent.



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² U.S.D.A. Agricultural Statistics, 1942, p. 130; and Agricultural Statistics, 1954, p. 70.

You will note in the accompanying chart that the full effect of resistance to curly top and leaf spot and better-adapted American varieties was not shown until the last decade, 1946 to 1955. If you consider only the last five years, the average acre yield is 15.9 tons and the gain is $5\frac{1}{2}$ tons, or 53 percent.

Let's go a little further in our analysis. The actual value of the increased yield per acre of the last twenty years over the first twenty years totals nearly 500 million dollars more for farmers. It has averaged \$30.68 more for each acre harvested.

During the last twenty years, slightly more than eleven million dollars have been spent on agricultural research in sugar beets by U.S.D.A. state experiment stations, sugar companies and other agencies. These research funds have really paid off. You might want to claim that all of the increased production is due to our research efforts, but if we claim more modestly half of the total gains as contributed by our improved varieties and agronomic research, the ratio of cost to increased value to farmers shows a return of \$22 for each dollar spent for research.

The payoff during the last five years for each dollar spent on research shows a return of \$51 if we claim only 50 percent of the increase when compared with the 1916 to 1935 period. Certainly this may be the proper forecast for future research returns.

It is inspiring to recount some of the things that have taken place in the last two decades of sugar beet production since the inception of this Society. Twenty years ago all of the beets were produced with hand labor. The 1955 crop saw 97 percent to 98 percent of the total acreage harvested by machines, and hand topping is now a rarity. In the words of George Gobel, "You can't hardly find them things no more!"

Development of segmenting and decorticating seed brought along with it improved drills and equipment and a definite saving in labor. Application of machine thinning and weeding tools for in-the-row cultivation has drastically changed all former hand thinning methods.

Variety improvement in yield, sugar, and processing quality has had a pronounced effect on grower's production and factory operation. Only seven years ago a few monogerm seed-bearing plants were discovered in Oregon. These are being transferred into the germ plasm of present commercial varieties, and it is safe to say that in another decade, we will be considering only single germ seed strains. When we combine new hybrid monogerm varieties with selective weed chemicals and complete machine thinning, you can readily appreciate that we are on the threshold of far higher plateaus of production.

Modern machinery, equipment, and the know-how to use it has done much to save labor, and revolutionary progress has been made. We know, however, that farmers are still searching for additional ways to save time and effort.

Not all of the dramatic progress has been made in mechanization and variety improvement. Fungicides, insecticides, nematocides, weedicides, and the improvements in our processing of the sugar beet have contributed

greatly to more efficiency in production and extraction. Included in chemical advances are improved and greater use of mineral fertilizers. Our soils have been yielding larger and larger crops with better control of insects, viruses, and diseases through use of some of the newer chemicals. A new plateau of production has been realized on the sugar beet farm through a combination of these splendid achievements of our research endeavors.

We Americans get impatient for results in our way of life, and too often we probably are too practical in what we ask of agricultural research. I feel that recently there has been an improved attitude in our beet sugar research thinking toward fundamental and basic research. A few years ago studies started on the question of "how sugar beets grow." It started giving us information that undoubtedly will have a pronounced effect on our ability to increase development of the crop in the future under differences in climate and environment.

Henry Wallace recently said that basic research "has an uncanny way of becoming practical." I hope that this trend becomes apparent as achievements in future research are brought about. Quite often we get discouraged in not seeing the translation of the results of the fundamental type of research to practical application. We should not apologize for this lag between new discoveries and their general use as it is just an example of our way of doing things and in accepting new ideas. Some researchers recently reported a study at Iowa State College in the last fifteen years that there is quite a variation in the way farm folks adopt new methods. They have found that there is always a group that adopt things quickly, but there are others who are satisfied with their mode of doing things and are slower to partake of the fruits of the new ideas. On the average it takes about seven years between the time that the first people accept the new practices and general adoption by most farmers. As an example, acceptance of hybrid seed corn took fourteen years before 93 percent of the acreage was planted to the new types in the corn belt.

The studies show, however, that with chemical control of insects, weeds, and diseases, it has been found that from the time the first experimental work has been proven successful, farmers are apt to rush into using the chemicals very quickly and on a large proportion of acreage before all of the dangers have been thoroughly explored.

The acceptance of scientific advances, however, in the last few years by sugar beet growers indicates the soundness of our research and that, on the whole, we have established a very good respect for our findings and that our extension team has helped immensely. This is due to the closeness in which we operate in the sugar beet industry between the men who are responsible for disseminating the information to the growers and the actual research staffs in our Department of Agriculture, college experiment stations, and company research stations. Due to this close-knit organization, the information has been used intelligently and effectively to bring about quick use of the findings. Let us hope that this continuation of mutual respect, confidence, and understanding will sustain our work in the future.

There is one thing evident in our future research policy that should be emphasized, and that is that our soils in recent years have yielded pheno-

menally large tonnages. A withdrawal of the plant food required for these higher-yielding crops means a more rapid depletion of our resources for the future. We must be ever alert to restore and rebuild the potential soil reservoir. Fundamental knowledge of the basic processes of the sugar beet plant is necessary in order to fulfill further advances in sugar production. With every improvement in productivity of our beet strains, we must apply continued vigorous, basic studies of soil flora and physiology of the beet plant that will pay off in better nutrition for future crops. In our quest for higher sugar production, we must not overlook the use of new herbicides; new treatments for diseases, insects and pests; breeding of nematode resistance and virus resistant strains in conjunction with improved fertilizers; and in those areas where irrigation is practiced, a better, more efficient utilization of water. Let us always keep sufficient funds in our "Scientific Bank" to keep ahead of the necessary withdrawals for improved crop production.
