FARMING OF TOMORROW

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THE CHANGES that are taking place in agriculture can be illustrated by making a comparison with the automobile industry. As you know, automobile builders bring out yearly models. Each model is faster, more powerful, beautiful, dependable, and convenient than the one which came before. Back of that constant progress is the work of scientists and engineers, toiling in their laboratories and shops. Millions of dollars are spent each year in developing and testing new designs, new gadgets, and new manufacturing processes that give us finer motor cars.

Mr. Clark makes no claim as a prophet, but he does believe the results of present day research will exert far reaching influence on the agriculture of the coming generation.

In the following pages he tells briefly some of the findings of science that are likely to shape the development of farming in Wisconsin.

This material was originally delivered over Radio Stations WHA and WIBL, which are owned by the state of Wisconsin. At the request of some of the listeners we have now combined the five talks inside a single cover.

That's the picture in the automobile industry. Now, what of agriculture? Farmers never run full-page magazine advertisements telling about a new model of wheat or spinach, nor boasting about the laboratories and proving grounds that made them possible. Individual farmers are not equipped to do such work; their business is too small to permit spending money for research in the fashion of billion-dollar corporations.

age, and ensilage cutters have likewise been reduced in size and cost, at the same time their efficiency has been increased.

Feed grinding is another field toward which this Station has made notable contributions. First, improvements were made in the hammer mills used for grinding grain. Next, a method of measuring the fineness of ground grain was perfected. Just last year an improved buhr type mill for farm use was announced - and this I believe is among the most interesting of the new types of farm equipment on the horizon today.

The new buhr mill enables a farmer to grind feed with no more strenuous exertion than throwing an electric switch or starting a small gasoline engine - and what is even more important, it will be cheap to buy, and economical to operate. Grain is fed to the mill by gravity from an overhead bin, and the ground feed conveyed to another bin through a blower. The machine is specially designed to prevent clogging, and to allow foreign particles such as nails or small stones to pass through without harm - in other words, it is capable of automatic operation, without an attendant. Two manufacturers of farm equipment have already made arrangements to put this type of mill on the market.

Engineering Helps Dairying

One application of engineering to agriculture which we do not ordinarily think of as such is that concerned with the processing and packaging of foods, particularly dairy products. In our Dairy Industry department we have been able to make many contributions in these fields. We have designed equipment for direct irradiation of milk by means of ultra-violet light; we have been able to evaluate metals and alloys as to their usefulness in dairy equipment by studying their solubility in milk and their consequent effect on flavor; and we have devised new methods of packaging cheese. In the same manner the engineer has contributed his skill to the task of making more nutritious, sanitary, and attractive our fluid milk and cream; condensed and evaporated milk; butter; cheese; and ice cream.

I could go on at considerable length to tell you of the contributions made at this Station in the application of engineering to land drainage, to land clearing methods, and to farm building construction. Because of limitations of time I shall have to dismiss them with this bare mention.

Right now I want to discuss a matter that has of recent years come to be recognized as Public Enemy No. 1 of American agriculture. I refer to soil erosion - to the damage done by run-off water on sloping lands. This is a relatively new field of engineering in this country, but old in many parts of the world.

Erosion Menaces Farming

Erosion is a most serious menace because it steals from us our most precious and most fundamental resource, the soil. Thousands of acres of good Wisconsin land have been cut by gullies to such an extent that they are all but ruined. Many more thousands have had their fertility sapped by the less spectacular, but almost as damaging, sheet erosion.

The ravages of erosion are not confined to destruction of farm land. Human lives, as well as property, are often endangered for hundreds of miles along river valleys by the floods that start with the uncontrolled run-off of drainage water. Hundreds of thousands of tons of silt are annually carried from our farms and dropped in the rivers - there to obstruct navigation and thus make expensive dredging necessary.

This Station owns, near LaCrosse, a branch experiment station devoted solely to the study of soil erosion. It is now operated in cooperation with the federal government. Here we have facilities for learning the conditions which encourage soil erosion, but even more important, we are investigating and developing new ways of controlling erosion.

At this branch station we have learned erosion can effectively be reduced by planting the steeper slopes and ridges to forest, by growing only hay and pasture on the medium slopes, and by confining cultivated crops to the nearly level fields. You will note that, at the outset, erosion is not primarily an engineering problem, but rather one of wise land use. Farmers are becoming increasingly aware that it is more desirable to prevent erosion rather than allow it to gain the upper hand before attempting to control it.

Erosion Control Requires Proper Cropping Practices Plus Engineering Devices

When erosion once gets out of hand to such an extent that it cannot be controlled by good farming practices, we must then look to the skill of the engineer for a solution. Agricultural engineers have demonstrated the value of properly designed and constructed soil-saving dams in filling gullies, and of terracing slopes to conduct run-off water slowly along the contour of hills instead of allowing it to rush down the hillsides. The erosion control work of 18 CCC camps in this state has been based on research carried out cooperatively by the Wisconsin Agricultural and Engineering Experiment Stations.

The University has cooperated also with the federal government in maintaining a soil erosion control project embracing 90,000 acres in the Coon Creek area of Vernon, LaCrosse, and Monroe counties. This project was the first of its kind to be established in the United States, and has served as a model for many others in various parts of the country, as well as a practical demonstration for farmers of this state.

We are destined to hear much more about soil erosion in the future than we have in the past. The federal government now contemplates an extensive fight against this menace, with benefit payments to cooperating farmers, as a substitute for the Agricultural Adjustment Act.

It is certain that farming is bound to grow more scientific and more complex in the future. We can expect the engineer and his machines to occupy an increasingly more important place in our American agriculture. The engineer has proved his ability to serve in scores of ways that make farming less back-breaking, more secure, more efficient, and a whole lot more interesting. He will not disappoint us in the future.

it seems to me, the need for wise caution in making investments, particularly if one has to go into debt for them. It is better to remain a tenant for a few more years than to buy a farm with a heavy mortgage and thus take a chance on getting into such an uncomfortable situation if crops are a partial failure or the prices of farm products happen to fall.

Now to consider the problem of marketing. During the past generation the advantages of cooperation in this field have come to be appreciated by farmers. When efficiently administered, cooperative marketing is instrumental in reducing the ordinary costs of marketing, and thus brings a greater net return to the producers. Cooperation is useful in bringing about high standards of quality, thus assuring top prices. Moreover, cooperatives exert a steadying influence on prices by marketing farm products in an orderly fashion instead of glutting the market at those seasons when the product is ready to be sold.

Within recent years farmers have begun to realize that cooperative purchasing likewise is feasible. By buying feed, fertilizer, and other farm supplies in large quantities, they are able to get better quality, and often lower prices, than they could secure individually.

Efficient Management Required

But farmers have learned by experience that successful cooperation demands efficient business management. There is nothing magical about cooperative marketing or cooperative purchasing; they must be conducted on a thoroughly sound basis if they are to survive. In working out standards, techniques, and policies for the organization and administration of cooperatives, research at this Station has played an important part.

I believe it is significant the way agricultural research developed at this Station. In the beginning the whole problem was to help the individual farmer find better ways of cultivating crops and feeding livestock, of combatting insect pests and plant and animal diseases. In other words, the emphasis was on production. A farmer was not greatly concerned, in those days, with what went on outside his own line fences.

Gradually farmers came to realize that, in commercial agriculture, marketing is just as important as production. Soon came the further recognition that marketing is not an individual, but a collective problem. For this reason the Wisconsin Station during the past generation has met a constantly increasing number of requests for aid in helping farmers to help themselves by group action in farm marketing and in various other fields of economic and social endeavor.

Plan Wiser Use of Wisconsin Lands

This movement in the direction of group action does not mean farmers have abandoned their time-honored heritage of individualism. Of all the occupations open to present day Americans, farming represents the largest field in which the worker manages his own business. The farmer is his own boss. He takes

no orders from others. With the passing of the years the independence of farmers has not been changed in essence, but has been modified in form, for now farmers have perceived the wisdom of managing their own economic and social organizations as well as their actual farming operations.

Another broad field of agricultural economics is that of land use. I am now not talking primarily of the individual farmer's problem in deciding what to grow on each field, but rather of the question, What is the best use for land in a particular area? Years ago most of us believed that nearly all of rural Wisconsin would some day become farm land. We realize today that we were wrong about that, for millions of acres in this state plainly are not suitable for agriculture. Most of them, however, are of potential value for other purposes. Much of northern Wisconsin is well adapted to forestry. Those regions having lakes and streams have large recreational possibilities.

Let me emphasize the need for research, for planning, and for cooperation in putting our natural resources in land to the uses for which they are most valuable. It is emphatically not an individual matter. An individual family may be content to exist in some remote, barren locality - forcing the state, county, and township to maintain a road to their door, a school to educate their children, and perhaps if they go onto public relief, to furnish the necessities of life at governmental expense as well - but the rest of us may object to footing the bill. It is to the interests of all of us that only land that is capable of yielding an American standard of living be farmed.

Wisconsin Pioneered in Land Zoning

In this matter of finding the best uses for land, and encouraging that use, Wisconsin is the pioneer among the states of the Union. This state has a zoning law which permits counties to specify the uses to be made of the land within their borders. During the past decade more than 20 northern counties have put zoning into operation; and the results have been a saving of tax funds, prevention of heartbreaking attempts to wrest a living from unproductive land in consequence of unwise settlement, and a start toward thoroughly efficient utilization of land resources.

Finally, agriculture faces the task of adjusting itself to changed conditions of demand for its products. This has been an acute problem since foreign demand for American foods began to shrink with the onset of the world depression. The need is now for adjustment of agricultural production along such lines that farmers are assured an American standard of living, and consumers are provided with constantly better foods at prices they can afford to pay. Such a solution cannot be expected to appear automatically; it can be achieved only through the use of science to find new and better ways of organizing our agricultural industry.

We are at present engaged in an analysis of the probable effects on our livestock production, and on our farm income, which are likely to occur if Wisconsin farmers follow the suggestions of the new federal farm legislation, and greatly increase their acreage of grass and other forage crops.