

# Agriculture in the Future

R. E. Seltzer

The greatest immediate problem of American agriculture is its tremendous productivity—productivity in excess of total domestic demand and in excess of export demand at prices in line with our costs of production. Contrast this with Soviet agriculture which is even now undergoing another purge to attempt to discover the causes, and to institute remedies, for their chronic scarcity of agricultural production.

The United States produces an embarrassing surplus with less than 10 per cent of our population employed on farms; the USSR is faced with an embarrassing scarcity with over 40 per cent of its population employed in agriculture. I leave it to you, which problem would you choose?

Why does this difference occur? I believe that two major factors are responsible: (1) the research, teaching, and extension activities of the Land Grant Colleges of Agriculture, and (2) the motivating force of profit in the conduct of American business. Some people seem to feel that "profit" is a sort of nasty word, that it has a connotation of greed, but I feel that most Americans work for God, for country, and for profit, and many might even question the order in which I have ranked these goals.

Profit is the catalyst of progress. The hope of profitable application stimulates research and the adoption of research findings. Profitable research is often the prerequisite to further research in any field or science.

## All Research Ultimately Valuable

Much research may have no immediate practical application, and we often use as an identifying characteristic the term "basic" research. But even basic research draws support from the idea that some day, somehow, somewhere the findings of such research may have tremendous practical value in some application or another. Thus, these two major goals, profit and research, are seen to be complementary in their effects.

What are the major observable trends which will influence the organization, technology, and scale of agricultural production in the next few years? First is the clearly demonstrated trend toward bigness in agriculture and in agriculturally-related industries. Nowhere is this trend more readily apparent than in Ari-

zona. Substantial economies of scale are apparent in many agricultural enterprises and, although less apparent, are nevertheless just as real as many others.

Not only are producing units becoming larger in terms of acreage, number, etc., but they are also increasing in scale through intensification. We have fewer farms, larger farms, and farms producing a greater yield per acre and per man. Since the end of World War II, output per man hour has increased more rapidly in agriculture than in any other industry.

Some examples may serve to point up this tendency toward bigness. In Arizona the gross value of sales from typical farms runs in the neighborhood of \$40,000 to \$50,000 per year and net returns per farm average between \$10,000 and \$15,000. This is nearly twice as great as the income per farm produced in any other state and about five times the national average. Our irrigated farms will average about 320 acres (half a section) in size and our cattle ranches will average 50 to 60 sections in size and will run an average of about 400 cow units.

## 1,000 Cow Dairies Now

Our dairies are twice as large as they were 10 years ago and now average about 130 cows, with several near or even over the 1,000-cow size. Poultry, too, is experiencing a trend toward bigness. The backyard and farm flocks of yesterday are nearly a thing of the past, and our eggs and broilers are now produced in large commercial operations of 5, 10, 50, and up to 100 thousand chickens. Our vegetable industry has for years been dominated by large grower-packer-shipper units, where diversification product-wise and area-wise, and substantial capital and credit of such large firms enable them to survive the risks inherent in this speculative industry.

Cattle-feeding provides another good example of the growth so characteristic of our agriculture. Over half our cattle in Arizona are fed out in feedlots of 10,000 head capacity or greater, and our feedlots operate close to capacity every month of the year.

Some people see the increasing size of agricultural enterprises as a threat to the existence of the so-called "family farm." I do not agree. These people are not well informed. We are not trending away from the family farm, we are trending toward it. The family farm must grow

This is a portion of an address made by Raymond E. Seltzer, retiring head of the Department of Agricultural Economics, University of Arizona, before the Agricultural College Men's Club on May 9, 1961. At this final meeting of the school year the club was host to graduate students of the College of Agriculture, students and staff comprising an audience of 215 luncheon guests. Dr. Seltzer has joined the staff of an independent research organization.

toward an economic-sized unit if it is to survive in the light of the changing technology of agricultural production.

We may well ask, what will limit the growth potential of our agricultural firms? To me, two factors would seem to be of paramount importance—management and capital. Of these two, management may be the real barrier to growth. Management capable of operating large agricultural units is probably the one scarce resource. Given proven, capable management, capital will cease to be a limitation as successful corporate farming units may tap investment markets through the sale of stock. The failures and the successes of large farming units here in Arizona are a reflection of the adequacy of their management more than any other factor.

## Trends in Service, Marketing

As we turn from the farm itself, we see similar evidences of increasing scale in our farm supply, farm service and marketing firms. The economies and efficiencies associated with large size are recognized in these agriculturally-related industries just as they are on farms and ranches themselves. The farmer deals with and through large businesses—in agricultural chemicals, farm machinery, feeds and feedstuffs, water, power and many other purchased inputs. He markets to and through large middlemen or cooperatives, or deals directly with processors themselves. The final stage of the marketing process, retailing, provides the most striking evidence of growth. The overriding goal of the modern supermarket is volume. Both chain stores and independents operate in a fiercely competitive market which keeps margins of profit low, but which emphasizes the importance of volume as the key to success.

The second major trend which we all see taking place is the increasing mechanization of agricultural production, processing, and marketing. Much of the gain in the productivity of labor in American agriculture has been the result of the combination of men and machines in agricultural production. There are strong incentives toward mechanization. Mechanization may often reduce costs through increasing efficiency. However, we also realize that some jobs and some farms may be over-equipped, and that the marginal rates of substitution of machinery for labor define the critical limits beyond which further equipment adds to costs of production per unit of output.

Mechanization may be carried beyond this point of diminishing economic returns for reasons other than cost. It may make a hard or a distasteful job easier or more pleasant, and if a producer can afford this aspect of mechanization, additional equipment may be justified in his particular set of values. Mechanization makes the producer more independent. If he has adequate equipment he can perform various operations at the time and in a manner which he considers most desirable. He is not dependent on schedules of custom operators, nor is he dependent on an often unpredictable and sometimes unsatisfactory source of farm labor.

### **Farm Labor Unions**

The difficulties of finding adequate supplies of labor constitute a real inducement toward mechanization. There is increasing activity in attempts by labor unions to organize farm labor. Numerous strikes in California last year presented serious difficulties in the harvest of certain perishable crops. Similar forces are at work in an attempt to increase the coverage of our minimum wage laws and to raise the legal minimum wage. Agriculture in Arizona employs two general types of labor—the skilled, dependable year-round farm workers and large amounts of unskilled, migrant, seasonal labor.

It is with this last type of labor that most of the difficulties occasioned by unionization and minimum wage legislation would be felt. Much of this labor, although not all, is of a residual character—a sort of scraping the bottom of the barrel. Many of these people lack the skills, the ambition, and the reliability necessary to hold steady jobs. They do not identify themselves with any one employer, and they exhibit little interest in a level of performance beyond the minimum necessary to hold intermittent jobs. Unionization and minimum-wage legislation, ap-

plied to such labor will provide the spur for rapid advances in mechanization of agricultural production and harvesting operations.

A third direction of agricultural progress is toward the increasing application of scientific technology in our production, processing, and marketing of farm and ranch products. Fertilizers, insecticides, feed additives, antibiotics, growth regulators, new varieties, disease control, nutrition, conservation, mechanization, accounting, systems analysis, quality control, tax planning, finance and many other highly technical subjects are of ever-increasing concern to the modern farmer. Obviously, all of these technical fields provide a wealth of opportunities for research, education, and extension. Equally evident is the fact that no farmer or rancher can qualify as an expert in all these areas.

### **The Consultant-Salesman**

This has resulted in the addition of a new layer of personnel to our agriculture—the technical salesman or consultant. In many cases the typical farmer will get the greatest part of his technical advice from the salesman, the field representative, the accountant, or the lawyer. These men sell products, services and themselves. In many cases there is little real difference among the products of the various companies available to any farmer. The soundness of the salesman's advice, his knowledge of his product, and his personality and salesmanship will often be the deciding factors in the farmer's choice of the product he purchases.

Farmers and their organizations are also making greater use of technical consultants in all fields for testing services, advice, and consultation with respect to their technical problems of production and marketing. Agriculturally-related industries devote increasing attention to research into all aspects of their business in order to maintain their competitive position.

Integration, forwards and backwards, horizontally and vertically, is receiving increasing attention. Vertical integration represents a combination of ownership or control of successive stages in the production, processing, and marketing process. Horizontal integration represents replication of similar units, usually in a geographic sense. Vertical integration represents integration in depth, horizontal represents integration in breadth. Forward integration represents a consolidation of control of operations from the point of production forward toward the retailer. Backward integration represents

consolidation by the retailer, wholesaler, processor, or farm supply dealer backward toward the farm.

Actually, integration is the reflection of advantages which appear to the integrator who may be a farmer, feed dealer, processor, wholesaler, or a retail food chain. The farmer sees integration as a way of expanding his capital base through cost and profit-sharing contracts with suppliers or processors. Thus, he may be able to expand without resorting to borrowing. He may also see integration as a means of reducing risk and adding technical assistance. In return for these advantages, he necessarily relinquishes a part of his managerial freedom.

The farm supplier, for example the feed dealer, sees integration as a means of establishing "captive" markets, of reducing sales expense and, at times, as a means of building and participating in a profitable farming operation. The processor, wholesaler, and retailer all have two major concerns for which integration seems to offer a partial answer. These concerns are quality and regularity of supply. Modern mass merchandising demands a constant flow of a uniform product tailored to the demands and preferences of the consumer. Integrated grower-processor contracts and processor-wholesaler or processor-retailer contracts provide the processor, wholesaler, and retailer with a measure of control over the variety, class, type, and quality of commodities produced, also control over the terms, timing, and sometimes price at delivery.

### **A Continuing Trend**

Specification buying will grow as retail food chains continue their growth. Contract farming will grow in some industries (for example, over 90 per cent of the commercial broilers produced are grown under contract), but will not dominate agriculture as some people fear. However, specification buying will become an increasingly important factor in directing the type and timing of agricultural production as producers, processors and market agencies find it necessary to orient their operations to the demands of the retailer.

Another well-defined trend, if I may be permitted to coin a word, is the "businessization" of agriculture. We speak of mechanization, specialization, capitalization, etc. so why not businessization. The term as I am using it here, is intended to refer to the application of the principles of sound business management in the

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# Sound Diet Is Best Medicine

Catherine M. Adams

The best medicine, if you aren't sick, is no medicine at all. And unless there is a real or suspected dietary deficiency, there is no reason in the world to fill the human system with pills, potions, vitamin capsules, blood purifiers and bone builders.

Actually, the American people spend many millions of dollars a year on these concoctions for which there is no physical need. Likewise, medical science suspects that abnormal dosage of some of the vitamins may actually be harmful.

## We All Eat Well

The American food supply is unsurpassed in volume, variety and quality. Never before in the history of the world, and nowhere else in the world, has a population had as ready access to such an excellent food supply so reasonably priced. Fruits, fresh vegetables, eggs, meat, dairy products, poultry, fish, cereal foods—all are available in abundance, at moderate cost.

Yet, because of the high profit margin in the pills and potions designed "to correct dietary deficiencies," Americans living on the world's best diet are still spending millions of dollars that there is no need to spend.

Miss Adams is a staff member of the School of Home Economics.

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conduct of agricultural operations. Farming operations in Arizona and throughout the nation represent substantial businesses which benefit from sound managerial planning and the employment of professional business services.

It used to be that a farmer could about tell how he was getting along by going out and looking at his crops or his livestock. Now he has to go inside and look at his books. Records are of vital importance and accountants, bookkeepers, and tax consultants have become necessary adjuncts to successful farming operations.

## Competing For Resources

A final trend which should be noted is the increasing competition for the resources now employed in agriculture.

**GOOD FOOD, at left on white background, if eaten in balanced proportion, eliminates need for pills and potions shown on dark background, right.**

Distortion of facts about food and nutrition is big business—profitable big business—today. Science and superstition, woven into carefully worded advertising, paint a picture of imaginary nutritional deficiency, a word picture designed to appeal to the emotions of those who see and hear the advertising message.

## "Food From Tired Soil"

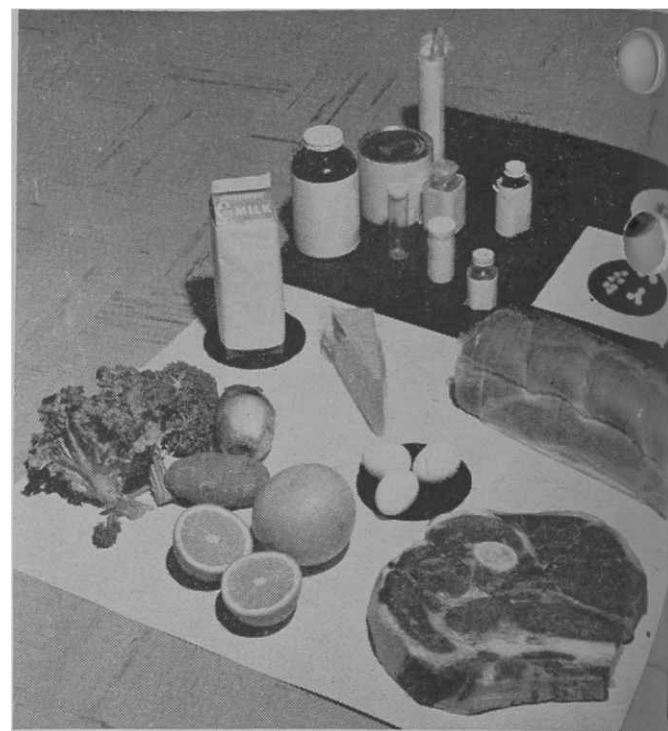
The claims that are made are fantastic. One pitch is that all diseases are directly due to a faulty diet. Another is that foods are grown on worn out, depleted soil, which is the cause of many malnourished people in America. The fact is that the quality of the soil is related to the quantity of any food produced on it, but has very little effect on the quality of the food.

Then there is the convincing argument of the constant danger of "subclinical deficiencies." This is a high-sounding technical term and apparently very effective in its use. It merely means a deficiency for which there are no observable symptoms. Almost any ailment from that "tired feeling" to an ingrown toenail may be projected by these so-called "health experts" as a subclinical deficiency and blamed on a shortage of essential nutrients.

Nutritive losses in the processing and cooking of foods, the harmfulness of certain types of cooking utensils, recommending of so-called miracle foods (yogurt, strap molasses, honey and vinegar, etc.) are among other claims currently

Cur current surplus problem would seem to indicate the desirability of diverting resources from agricultural production, and many of our farm programs do have this as an objective. On the other hand, we are faced with a rapidly increasing population—now 180 million, 230 million by 1975, and from 600 to 900 million expected by 2060. We must use care in reducing our agricultural resource base to insure that the process can be reversed when the need arises.

In the area of resource competition, we in Arizona are most acutely aware of the competition for water—for domestic, industrial, and agricultural use. Agriculture is the residual user of water, domestic and industrial uses being able to pay much more for water than is possible in



used by these hoaxers. The use of a smattering of scientific knowledge in the promotion of their wares gives these self-styled authorities an air of plausibility.

## Balanced Diet Answers Needs

Actually, bona-fide nutrition authorities agree that needed nutrients can best be obtained from vegetables, fruits, milk, eggs, meat and whole grain or enriched bread and cereals. These foods are readily available and they provide all the vitamins, minerals, proteins and other nutrients that a normal healthy individual requires in his diet. Too many people are currently throwing away hard-earned money on useless products and senseless literature instead of buying wholesome nutritious food.

The best defense against nutrition hokum is knowledge of what constitutes good nutrition, an intelligent skepticism about extravagant and mysterious claims related to nutrition, and information from reliable sources.

its use for irrigation. We also see increasing competition for land—for residential, industrial, and recreational uses. For example, about 90,000 acres of fertile Salt River Valley land has been diverted from agriculture to small plots of weedy Bermuda and colored gravel—home sites. Half of Tovrea's feedlot—one of the world's largest—has been torn down for sale as industrial sites.

These, then, are some of the major trends which will shape the future of American agriculture. The Land Grant College of Agriculture has had an important role in bringing agriculture to its present productive state, and can do so in the future providing it recognizes the changing complexion of the industry with which it works and adjusts its program to this change.