



CHAPTER 13

*Role of education in agriculture;
college curriculums; teachers;
the extension service; vocational
agriculture.*

Changes in Education to Meet Agricultural and Rural Adjustments

H. BROOKS JAMES
North Carolina State College

JOSEPH ACKERMAN
Farm Foundation

THE ADVANCE of the American people in well-being, in comfortable living, in culture and refinement, in productive capacity, in usefulness as citizens, must for the most part be attributed to education. Most of the important differences between man 10,000 years ago and today are due to education.

The people of the United States have long believed in the necessity for some education for all the people. We know that an enlightened electorate is essential in our form of government. The success of a democracy thrives or languishes by the ability of its people to choose wisely. We designed a nationwide public school system that pro-

duces a degree of literacy no other nation has matched. Our land-grant colleges were created to provide higher educational opportunities for the masses, i.e., for the sons and daughters of farmers and mechanics. These institutions have done a remarkable job, and their impact has been felt not only in the United States but throughout the entire world.

Education furnished one of the great drives behind our economic growth. It stimulated both sides of the production-consumption equation. However, as significant as the contributions of the past may be, they are no cause for complacency. Although education has made great strides forward in this country, it obviously has not succeeded in solving many economic, social, and political problems of the individual, community, state, nation, and the world.

U.S. agriculture, like the rest of the economy, is undergoing rapid and accelerating change due to technological and scientific developments and improved methods of organization and management. These changes have resulted in steadily rising per capita incomes during the past two decades for the population as a whole. However, the U.S. farming industry has been in a persistently unfavorable position from the standpoint of prices received, incomes, employment opportunities, and in other respects. Education must help achieve a more positive, continuous adjustment which will assure farming its full share of the benefits of economic growth. Farmers basically want equality of opportunity with the rest of society. This includes not only income opportunities but also social, educational, and other types of opportunities.

Numerous adjustments are required if the gains of technological progress in farming are to be fully realized by both farmers and total society. Unless the adoption of new technology is accompanied by the necessary resource adjustments, society may be prevented from reaping the full rewards of the technological progress because it is denied the use of resources released from farming for other

purposes. Unless excess resources are moved out of farming, overproduction and surpluses will persist, depressing farm prices and incomes.

Many of the needed adjustments are controlled by society as a whole rather than by the farm sector alone. The broad public—farm and nonfarm—needs to understand the problems and issues before society as a whole can take constructive steps in the common national interest. This kind of improved understanding of public issues can be fostered only by institutions that enjoy the full confidence of the public and mobilize all their educational resources to meet the challenge.

A NEW CONCEPT OF AGRICULTURE

In an address on education and self-education, Whitehead said:

There have been moments in history when new worlds were discovered. There was such a moment when Columbus discovered America. Creation widened to man's view. There is such a moment now. We are all aware that the immediate future holds within it possibilities different from anything that has been known in the past. Our views are widened.

Mankind has entered upon a new phase. It is no good saying that you will go on in the future as you have in the past.¹

Our views of agriculture have also widened. As a result of recent adjustments in agriculture, a new concept of agriculture is emerging. In this concept, agriculture is defined to include three important segments of our economy.

The first segment includes the farmers engaged in the production of crops and livestock. Approximately seven million people are employed on farms in the United States.

The second segment includes those industries which furnish supplies and services to farmers. This group of

¹ Alfred North Whitehead, *Essays in Science and Philosophy*, Philosophical Library, New York, 1948, p. 123.

industries employs over six million people and is vital to the emerging concept of "agribusiness."

The third segment includes those industries and commercial enterprises that process, store, handle, and merchandise farm products. This is the largest of the three segments in terms of the number of people employed. Currently, this group of industries employs more than ten million people, and it will grow larger in proportion to farming.

Together these three groups employ approximately 37 percent of the total number of persons employed in the United States. Taking this broad view, more than one out of every three employed persons work in agriculture. Any way you look at it, these three groups are important segments of the national economy.

By defining agriculture in this way, we are able to draw a sharp distinction between farming and agriculture. Historically, agricultural education was developed with the primary objective of producing graduates who were ostensibly to become farmers; thus little or no distinction was made between farming and agriculture. The training of farmers is important. We should continue to do the best job possible of training those who wish to return to the land, but this in itself is no longer adequate as the sole function of agricultural education.

Producing efficient farmers is not enough. The supply industries as well as the processing and marketing industries must be efficient if we are to compete effectively with synthetic products and other regions of the world in the market place. As agriculture becomes more highly specialized and competitive, and as we seek better methods and greater efficiency, more advanced and broader knowledge is required.

Moreover, the social and economic problems with which the farm family must deal are continually increasing. These extend beyond the farm borders and become inter-

woven into the entire rural community. Thus, agricultural education in the future must deal not only with agriculture but also with a wide variety of human and public problems.

NEW EDUCATIONAL PROGRAMS FOR AGRICULTURE

Modern agriculture requires well-educated, adaptable, capable young people who can adjust to changing times. The agricultural education program must be broad enough and flexible enough for each individual to develop commensurate with his own abilities.

Many agricultural education programs of the past have been aimed mainly at farming rather than agriculture in its broadest sense. They have been weighted heavily with applied training and have been weak in fundamentals. Many agricultural college curricula have failed to achieve a balance between science, business, technology, and liberal arts and thus have failed to produce well-rounded graduates capable of meeting the demands of a rapidly changing society.

How well are our educational institutions organized to serve agriculture defined in this broad sense? Agricultural education might be divided into at least three areas: (1) agricultural college; (2) agricultural extension — continuing adult education for those engaged in agriculture; and (3) agricultural education in public schools. The important question is whether these institutions are adjusting fast enough to the changing needs.

COLLEGES OF AGRICULTURE

General Education of Agricultural College Students

The general educational needs of the agricultural college student should be kept in mind because, in the first place, most students are not sure what they will want to do when they finish college. In the second place, they are not sure what their needs will be in terms of training for future leadership and enlightened citizenship. A good general education should be stressed regardless of the major

interest of the individual student. The educational experience should be designed to prepare students to cope with the constant adjustments required in a dynamic world.

Balance Between Applied and Basic Training

Most faculty members recognize that agricultural colleges were not established solely for the purpose of providing vocational education. This is not to deny the importance of some applied training. The question is how much applied training and how much basic training should be included in the curriculum. If we lean heavily toward applied training, the student may be better prepared for his first job. On the other hand, applied training may become out of date by the time the student has been on the job for a short while. In the long run, a basic understanding of principles may serve him better than simple knowledge of how to do things. The answer is subjective, but neither extreme appears to be the most desirable solution.

The authors are of the opinion that a student should have enough applied training to enable him to obtain a job and be successful in his first employment. Beyond this, it would appear much better for the student to devote his time to basic training, which will serve him over a much longer period of time, than mere training in technology which may change from day to day.

The twin objectives of "learning how to make a living" and "learning how to live" must be kept in mind as any curriculum is developed. Most institutions are not interested in training mere technicians. As has been said, "Man does not live by bread alone." Educational institutions should be producing educated individuals who are not only technically competent but also capable of assuming roles of leadership in an increasingly complex society.

Haphazard curricula do not develop such individuals. The social, economic, political, and technical problems of the world must be kept clearly in mind as the educational program is planned. The graduates of tomorrow will live

in a world with increased leisure time. Social problems will change as the dividing line between the city and the country disappears. Economic and political problems will become increasingly important as we attempt to live peacefully with our neighbors of the world.

Minimum Levels of Attainment for a Degree

The agricultural college must formulate objectives which can be used to guide the development of its educational program. The concept proposed here is one of minimum levels of attainment in specific areas of knowledge. The idea is that if a student reaches a minimum level of proficiency — particularly as to principles — in a specific area of knowledge, he will have sufficient background information to deal with complex problems and adjustments to be faced in later years. To insure that a student has achieved the minimum level of attainment in a specific area, different kinds of tests could be administered or the student could be required to complete certain academic work in the area involved, or a combination of the two approaches might be used.

The concept of minimum levels of attainment insures that a student not only meets minimum standards where degrees are awarded, but also has a reasonable balance of training in the various areas of knowledge that are essential in meeting the objective of the educational program.

Maximum Freedom for the Student

Students, fortunately, are not a homogeneous group. They come to college from different places with different backgrounds and with different objectives in mind. Consequently, each student wants a slightly different program. How much freedom should the student be given to develop his own program? Opinions on this subject vary widely, and curricula vary from those with little or no freedom to those allowing considerable choice on the part of the student.

Some educators believe that all students should be required to take certain courses. Others believe that students should be permitted to take the courses of their own choice with the faculty deciding what kind of degree will be awarded when the student has completed a prescribed number of courses. These are interesting extremes, but there should be a reasonable compromise which protects the standards and attains the objectives of the institution and still meets the needs of individual students.

A Practical Approach

To bring together the two concepts of minimum levels of attainment for a degree and maximum freedom for the student obviously involves compromise. Since curriculum development is subjective, there is no way of proving whether the compromise is optimum in terms of the objectives sought. The evaluation must simply be made in subjective terms, but with frequent and thorough re-evaluation.

One way to deal with minimum levels of attainment is to think in terms of the areas of knowledge, understanding, skills, and attitudes which should be included in the curriculum. One should think in terms of the competence which one wants to develop in the student and then develop a training program to attain them. However, instead of using an example dealing with competence, we will consider an example using areas of knowledge and semester hours. We shall assume that a minimum of 120 semester hours are required for graduation. Ten percent of the courses might be devoted to languages. Four courses would meet the requirements in this area.

Requiring 20 percent of the student's courses in social science and humanities would call for eight to ten courses in this area during his four years. In this category the student could study history with the idea of giving him a better understanding of the problems man has faced over time, how he solved them, and how this experience could

be used in solving present and future problems. Some work in political science will give the student a better understanding of the political system we have and how it affects the lives of individuals and the growth and development of society. Some psychology will give the student a better understanding of individual behavior, while sociology helps explain group behavior. Economics could be included to give the student a better understanding of our economic system and how it operates and of how to operate an individual enterprise in the most efficient way. Many other courses can be included under this category, but the above will serve as an example.

Requiring 20 percent as a minimum in the physical and biological sciences would permit eight to ten courses in this area. This could include a year in mathematics, a year of chemistry, a year or more of biological sciences, a course in physics, and perhaps other courses in these sciences.

The next category would be designated as "major requirements." Perhaps 20 percent of the total should be set aside for the major, or specialization. These courses could be additional science, business, or applied science or technology courses. The department offering the major would attempt to use this amount of time to give the student the best possible training in the chosen major.

The next area could be termed "restricted electives." About 20 percent of the student's total time would be allocated to courses selected by the student and his adviser. These would probably be courses in departments other than the department offering the major, but would be related to the main interest of the student.

The last category, "free electives," could be 10 percent of the student's total course requirements. This would permit the student four or five courses of his own choice which may or may not have any relationship to the chosen major. The student, in consultation with his adviser, should make use of free electives to round out his educational program.

In reviewing the above six categories it should be noted

that 50 percent of the student's time is allocated to required courses as a minimum for all students, and that 50 percent depends upon the student's choice of curriculum, major, and individual preference. Again it should be emphasized that these choices are subjective, but this compromise should provide an opportunity to develop a reasonably well-balanced program for the individual student. Minimum standards are protected and yet considerable freedom is permitted. The flexibility in such a program will provide the student with the necessary background to deal with the complex problems in a changing economy.

Good Teachers

Thomas H. Huxley said, "I care not what subject is taught, if only it be taught well." There is much wisdom in this statement. The authors would not go so far as to eliminate areas of knowledge considered essential, but they would be quite willing to substitute one course for another within a reasonable range if this would bring a student into contact with an outstanding teacher who can stimulate a student to think creatively.

John M. Mason said, "The aim of education should be to convert the mind into a living fountain and not a reservoir. That which is filled by merely pumping in will be emptied by pumping out." The goal should be teaching students to think, not to imitate or to memorize. If the objective of college training is to affect the behavioral pattern of students after they go out into the world, then it seems obvious enough that teachers must prepare their students to think for themselves. The kind of decisions people make depend upon the values they hold "dear" and the information they have at their command.

THE EXTENSION SERVICE

Extension, in fifty years of development, together with the research and resident instruction resources of the land-grant institutions, has developed a unique system for service in over 3,000 counties aimed at better, wiser manage-

ment decisions in the individual farm or family unit. Throughout the years the extension service has developed a sensitivity to people and to problems and concerns at the local level. It enjoys today a high degree of acceptance and a reputation for objectivity and integrity. Living in the United States, and particularly rural living, has been vastly improved as a result of extension's efforts.

The increasing competitiveness of farming, the unremitting pressure for constant innovation, and the national interest in an efficient agriculture all demand continuing and improved extension education in management and technology for farm people.

Scope of Extension's Responsibility in Agricultural Adjustment

Much of the resources of the agricultural educational institutions have been directed toward improving farm production and efficiency. Today, in addition to helping to maintain these increasing rates of production, many people are asking the land-grant institutions, and particularly the extension service, to devote more of their resources to solving the adjustment problems which arise as a result of economic changes associated with modern agriculture.

These adjustments center around bringing the aggregate total land, labor, capital, and management devoted to farming into line with needed agricultural production, combining resources in proportions that are in line with modern technology, and finally, using these resources on farms of efficient size.

In addition, a whole series of social, economic, and institutional changes are needed as a result of these primary adjustments and technical advances. These include the supply and marketing organizations which serve farming, schools, roads, churches, and all other community services. They also include urban development, taxation, and

water and land use. Adjustments are also required in areas associated with human resources, such as vocational guidance, training of rural youth, adult education programs in agriculture, and problems of the aged.

Since all these problems affect the broad public, farm and nonfarm, and require understanding and decisions by society as a whole, extension has a dual responsibility. It must bring to the farm public a better understanding of agriculture as an industry and its relationship to the rest of the economy. Farm people need to understand the limitations of what they as independent operators can do to improve their conditions, and the need for industry-wide approaches to the solution of many agricultural problems. Extension must also bring to the nonfarm public an understanding of the vital role of agriculture in the U.S. economy, of trends in agriculture which affect the welfare of the nation. They also need to understand the reasons for public policies that deal realistically with the basic causes of the chronic farm problem. The gap in understanding between farm and nonfarm groups must be bridged in order to produce a favorable climate for constructive public discussion and action on the problems of agricultural adjustment.

In trying to develop understanding of the agricultural adjustment problems created by economic progress, the educator's approach should be: (1) to analyze the problem, (2) to set forth the possible solutions, (3) to appraise the consequences of each of the solutions as objectively as possible, and (4) to allow each individual or group to choose which course of action best meets their values and over-all goals.

People make their decisions in the policy area on the basis of facts, what they think are facts, and upon personal values. The less facts they have available the more they rely upon their values and beliefs. These are largely the result of their cultural, religious, and economic background.

The function of the educator is to supply the facts, identify and clarify the issues involved, and provide the framework so that the individual may make a wiser decision.

People traditionally desire freedom from governmental intervention but they realize that economic and social growth and progress create complex new public problems that may demand more rather than less governmental intervention. Society can only be as good as the people composing it and operating it. Extension must accept this new challenge by providing all individuals with the basis for knowledge and judgment that is needed for great decisions. It needs to conduct a broad continuing education program designed to insure that the development of the individuals, the productiveness of their efforts, and their ability to make decisions are as great as can be achieved through educational means.

Programs Underway

Extension in its awareness of persistent change has initiated various programs to aid rural people in solving their adjustment problems. A few selected programs with their purposes and procedures are as follows:

PUBLIC AFFAIRS

The objective of educational programs in this area are to develop: (1) an active interest in public affairs, (2) an understanding of the problems, the alternative solutions, and the consequences of each of the solutions, (3) the ability to make decisions on public policy issues on the basis of a critical examination of the evidence and logical thinking, and (4) a desire and ability to participate effectively in the solution.

COUNTY PROGRAM PROJECTION

This activity involves county leaders in projecting where their county is headed economically, socially, ethically, and spiritually, with particular reference to agricul-

ture. It also includes an evaluation of these trends and a consideration of how they may be modified more in line with local people's goals.

RURAL DEVELOPMENT

This program has been aimed at helping the people in counties which have standards of living below a given economic level to appraise their situation and to develop plans for improving it. It usually has involved the entire county or region and may include programs for: (1) increasing the productivity of the farms in the area, (2) bringing in new or more industry, or (3) facilitating movement of surplus labor out of the area to other areas with more industrial opportunities.

COMMUNITY DEVELOPMENT

This program is directed at improving the ability of the people to identify and solve the problems affecting their welfare through their own initiative using available resources. It involves the entire community and may involve any or all the group activities of the community. In certain states, extension already is using this approach to solve area problems.

FARM AND HOME DEVELOPMENT

The purpose of this activity is to aid individual families in adjusting their farm businesses and homes to the new technological and economic conditions. With the rapid changes taking place, many farm families have expressed a need for aid with their individual problems in this area.

SUPPLY AND MARKETING FIRM ADJUSTMENT

The adjustments taking place on farms plus the technical changes directly affecting the marketing and supply firms make many changes necessary in the operation of these firms. Many states have extension activities to aid these firms in making needed adjustments.

Improving Service Through Specialization

Extension needs to make some changes if it is to continue to serve the growing needs of agriculture. Greater specialization seems to offer possibilities for meeting the needs. Some means of specialization being used and considered and which might be appropriate in the adjustment area are as follows:

1. Shift some of the resources of extension from increasing technology to increasing adjustments through: (a) increasing the proportion of the central staff's time spent on adjustments, particularly the economic and sociology staff, the supervisory staff, and the information staff; (b) giving priority to adjustments at the county level with the privilege of dropping certain other activities; and (c) assisting in retraining or equipping the staff to do the work in the adjustment area.

2. Increase the specialist staff and assign to them the responsibility of holding more of the formal meetings at the local level in agricultural adjustment or in other areas. Provide for more of the specialized extension work at the district level while continuing the organizational and more general extension work at the county level.

3. Appoint specialists to be responsible for the presentation of the adjustment program in regions or districts of the state.

4. Coordinate the work on a two or more county basis with each county worker specializing in certain subject matter fields in addition to his general duties. The county leader would be responsible for the over-all extension program in his county but in addition would be responsible for the presentation of his specialized subject matter in the entire group of the counties.

5. The reorganization of extension as suggested in 4 would probably result in each local extension office serving more than one county. In this way the staff at each unit can be enlarged, permitting greater specialization in each office.

AGRICULTURAL EDUCATION IN PUBLIC SCHOOLS

Place In School System

Agricultural education is a function of the entire school system rather than a function of a department in a secondary school or university. The elementary schools have long drawn on farm life and experiences in teaching basic subjects. Children are interested in animals and plants and are curious about their sources of food, clothing, and shelter. Because of the unique character of agriculture and its importance in the national economy, education about agriculture should be an integral part of the over-all elementary and secondary teaching program. Teachers should be given enough training in agriculture to provide the important facts about food and agriculture as a part of the basic courses.

Considering that agriculture is a major part of our national economy and that it affects every man, woman, and child, it is inconceivable that a modern program of general education would not include education in food and agriculture. It receives entirely inadequate and sometimes prejudiced treatment in our programs of general education.

Vocational Agriculture

The high school vocational agriculture program has been efficient and successful. It has shown boys how to be better farmers and how to improve their income opportunities. In addition, vocational agriculture education has contributed to college preparation. Studies indicate that a high percentage of the students enrolled in the colleges of agriculture have been influenced by their courses in vocational agriculture. Teachers of agriculture, because they worked closely with the students and their parents, have been able to be particularly helpful in counseling rural youth.

Vocational agriculture training programs have helped change the structure of agriculture and the role of agriculture in the national economy. The program helped develop better citizens, and these citizens contributed much to their

communities and strengthened leadership in agriculture. But with improvement in the productivity and income of some farmers has come a reduction in the number of farming opportunities for rural youth. Attention needs to be given to the vocational opportunities for those farm boys who no longer have satisfactory alternatives in farming, and at the same time improve the opportunities for those who remain in the farming occupation. A complete vocational education program should be developed as a supplement to general education for the farm youth.

Little change has been made in vocational agriculture education since its inception. The content of the courses in vocational agriculture as well as its place in the curriculum need re-examination. Educational leaders need to determine the proper emphasis to be given in courses in order to broadly educate young people who, to the limit of their respective abilities, can adjust to changing times.

Much agricultural education has been along the lines which brought about increased productivity in farming and the need for adjustment. Little attention has been given to the problems of adjustment and remodeling public education in agriculture to fit present and prospective conditions.

Studies show that only about 15 percent of the boys on farms will find opportunities in farming in the future. There is further indication that many of the young people growing up on farms will have inferior training as compared with those from urban areas. Fewer farm boys than nonfarm boys plan to go to college. A large proportion of farm boys, unless properly trained, will be qualified for only unskilled jobs. What is of more importance is that less than 20 percent of the boys who expect to farm are planning to take further training beyond high school and only a small percentage will actually take some additional formal training. Yet if the farmer of the future is to be a manager as well as a laborer, he will need much better training than most farmers now have. Vocational agriculture programs in secondary schools must be broad enough and flexible enough

so that the student will develop commensurate with his own abilities, so that he can step immediately into a job or can further pursue his education at the college of his choice.

There is further need for post-high school instruction, universally available, which will supplement secondary schools and colleges by promoting vocational and general education of adults. Efforts over a generation to provide the complete vocational education of farmers during the secondary school period have proved inadequate. The complexity of farming and the role of agriculture to economic growth requires more maturity on the part of students. The rapid development in agriculture requires a continuous re-education of those who have received basic education. Organized systematic instruction should be available to farmers and farmers' wives through their active careers in farming. This requires the coordinated efforts of all agencies.

