

# AGRICULTURAL ECONOMICS

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To

RICHARD T. ELY

A STUDENT WITH AN EVER YOUTHFUL AND OPEN  
MIND AND A TEACHER WHO GIVES AN  
INSPIRATION THAT LASTS

## PREFACE

THIS book is intended for the student and the farmer interested in the study of those economic principles which underlie the effective organization of the farm, and for the statesman interested in establishing laws and institutions for the development of agriculture. The subjects treated correspond to those studies grouped under the head of Farm Management in some colleges and under the head of Agricultural Economics in others. From the author's point of view these two terms as used at the present time cover essentially the same subject matter so far as they relate to the economics of production on the individual farm, but he believes that the latter term is much the broader, including also the problems of marketing, land economics, farm finance, and farm life.

The matter here presented is the result of a gradual development of twenty years of study in this field. Its publication marks the close of seventeen years of teaching of agricultural economics by the author in the University of Wisconsin, where he first gave a course to the short-course students in the winter of 1902-1903, at which time a "Syllabus of Lectures on Agricultural Economics" was printed for the use of his class. In 1905 "An Introduction to the Study of Agricultural Economics," containing thirteen chapters, was published, the main points of which have been included in the present volume. For many years, parts of the present volume have been mimeographed and used in the classroom.

While the author has been working in this field for twenty years he recognizes that the pioneer stage is only now passing and that the next few years will result in great progress both in research and education in agricultural economics. The present treatise is looked upon as being by no means a final statement on the subject, but the author's change of position

and the demand on the part of many of his former students for the materials which have been accumulated in his experience as a teacher make it seem advisable to publish this volume in its present form with the expectation that in a few years the rapid development of the subject will make it possible to make a much more adequate statement of the subject than is here presented.

The author wishes especially to thank Professors Richard T. Ely, T. N. Carver, W. J. Spillman, and G. F. Warren, who have been of great help to him from time to time, in conferences and through correspondence, in clearing up many of the difficult problems in this field. He has also received help from time to time from the succession of students who have been in his classes. In leaving the classroom to enter upon activities in the Government Service the author will miss the stimulus which he has received from year to year through contact with students. He is hoping that students who have occasion to use this book will feel free to write to him in regard to any of the subjects discussed in order that he may in some degree continue to keep in touch with student thought on this subject.

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# AGRICULTURAL ECONOMICS

## CHAPTER I

### AGRICULTURAL ECONOMICS DEFINED AND DESCRIBED

THE subject matter of Economics is found in the relations arising among men in their efforts to satisfy their wants for food, clothing, shelter, and the many conveniences and luxuries of life.

Such a relation arises when one man has wheat to sell and another wishes to buy wheat. Here the problem is that of agreeing upon the price at which the wheat is to be transferred. Other economic relations arise when the use of land is to be secured either by lease or by purchase, when equipments are to be purchased, and when labor is to be employed. In all these cases the relation centers upon the question of price fixing, *i.e.* the agreement upon a rental for land, a price for equipment, and a wage for labor. These relations which focus upon price determine in a large measure the character of the work which men will do, what they will produce, and the methods they will use in producing them. Thus it is, that choice of a farm, choice of live stock and machinery, the choice of crops, the size of farms, the grouping of farm enterprises, the intensity of culture, and hundreds of smaller matters which arise from day to day have to be settled in terms of the prices of things used in production, that is, the cost, and the prices which can be secured for the different articles which may be produced. The farm manager, in deciding upon what to do and what not to do to secure a maximum profit, bases his choices upon relative costs and relative prices.

There are those who look upon economic problems not as problems of production, but problems of distribution, that is, the problem of sharing the food, clothing, and shelter among



those who want it. Economics has to do with production as well as with distribution. If all human wants could be satisfied without any effort, there would be no economic problem, neither of production nor of distribution. But while she has provided abundant opportunities for producing the means of satisfying human wants, Nature has decreed that man must work, — “In the sweat of thy face shalt thou eat bread.” Or to give Virgil’s version of the same law,

The sire of all, great Jove himself decreed  
No work save those that task us should succeed.

Since it is by work that the wants of men are satisfied, it is of general interest that this work shall be so directed as to yield the largest possible returns in human satisfaction. Viewed from this standpoint it may be said that economics is first of all a treatment of the economy of energy required for the satisfaction of human needs. It is desirable that the energy required for the satisfaction of human wants be used most economically, not that men may work less strenuously, but that they may live more abundantly.

Farming is often spoken of as the most independent of all occupation, and it is true that the farmer is less dependent upon his fellow men than is his city brother. But while the farmer is brought into vital contact with other men less frequently than is the merchant or the manufacturer, yet, on the other hand, he is brought into much more vital contact with Nature. The manufacturer, for example, may know each evening what tasks are to engage his attention the next day, but the farmer simply knows what he would like to do, and awaits the dictations of the weather. Socially considered, the farmer may be more independent than the man of the city, but he is certainly more directly dependent upon the conditions set by his physical environment. Much that is characteristic of farm economics as a field of special inquiry grows out of this dependence upon Nature. This is shown especially in the influence of the seasons and the laws of plant growth upon the variety of work which the farmer performs.

But while the farmer may be more directly dependent upon Nature than are those engaged in the industries of the city, he is by no means independent of his fellow men. The pioneer farmer, who looked primarily to the satisfaction of the wants of his own household, may have selected the crops which he cultivated, without giving any thought to the needs of other men; but the modern farmer, who produces primarily for the market, and procures upon the market a large share of the necessities, conveniences, and luxuries of life, is bound to take into account the demands of his fellow men. The modern farmer must consider the price for which the produce can be sold as well as the costs of production, if he would manage his farm successfully.

This close dependence of the farmer upon physical and social conditions which are subject to variation from year to year makes it unprofitable for him to manage his work by rule of thumb. He must follow general principles rather than specific rules. He is always being required to adjust himself to new commercial conditions. Demands are being made upon his judgment many times in the course of each day's work, as he tries to adjust his farm operations to the varying conditions of soil and climate, ever holding in mind the demands of his market and the cost of each of the agencies of production, namely, land, labor, and equipment. It is necessary that the farmer be ever alert. "It is a maxim universally agreed upon in agriculture," says Pliny, "that nothing must be done too late; and again, that everything must be done at its proper season; while there is a third precept, which reminds us that opportunities lost can never be regained." It is, therefore, of exceedingly great importance that the farmer have in mind some guiding principles which, like the compass, will enable him to direct his actions in accordance with a definite purpose.

There remains until this day that class who fail to recognize the presence of natural laws, and who attribute the unusual success of the men of extraordinary ability to dishonesty or to foul play of some sort, while to "bad luck" they ascribe the results of their own lack of foresight, lack of judgment, or lack

of industry. These men who talk of "luck" and who are not willing to attribute to brain and brawn the success of their neighbors, may well draw a lesson from the following story, related by Pliny, the ancient writer already quoted:

"C. Furius Chresimus, a freedman, having found himself able, from a very small piece of land, to raise far more abundant harvests than his neighbors could from the largest farms, became the object of very considerable jealousy among them, and was accordingly accused of enticing away the crops of others by the practice of sorcery. Upon this, a day was named for his trial. Apprehensive of being condemned, when the question came to be put to the vote among the tribes, he had all his implements of husbandry brought into the Forum together with his farm servants, robust, well-conditioned, and well-clad people. The iron tools were of first-rate quality, the mattocks were stout and strong, the plowshares ponderous and substantial, and the oxen sleek and in prime condition. When all this had been done, 'Here, Roman citizens,' said he, 'are my implements of magic; but it is impossible for me to exhibit to your view, or to bring into this Forum, those midnight toils of mine, those early watchings, those sweats, and those fatigues.' Upon this, by the unanimous voice of the people, he was immediately acquitted."

It is highly desirable to emphasize the importance of strenuous mental and physical effort in winning success in farming. The element of uncertainty should not be underrated, for this is one of the characteristics of farming; but it should be remembered that as a rule the chance element is more or less equal in a given community, and at a given time, for all those who are competing for high rank as farmers. The big differences are due to differences in the farmers themselves, in their alertness and in the quality of their muscles and their minds. The more rational farmers are usually willing to admit that the unusual degree of success attained by one of their number is the result of hard work, clear thinking, and skillful management. These more intelligent farmers are coming to recognize that there are fundamental economic principles which, when carefully followed,

lead the way to success in agricultural production. To understand these principles is the reason for studying agricultural economics.

Of the recent writings on agricultural economics in Europe, that of Jouzier, a French writer, may be taken to illustrate the content of the phrase. "Philologists," says Jouzier, "tell us that the word economics is formed of two Greek words, which, united, mean laws, or rules of the household, that is to say, developing the idea which the ancients attached to the words, the manner of regulating the relations of the different elements composing the resources of the household, whether it be their relations to each other or to the members of the household, in order to insure the greatest prosperity of the family.

"The addition of the qualifying adjective, agricultural, does not change the meaning of the word 'economics' at all; it simply limits the domain to which it is to be applied. In place of saying 'the household' we must say the 'agricultural household.' But, as the agricultural household is the farm we shall say that *Agricultural Economics is that branch of agricultural science which treats of the manner of regulating the relations of the different elements composing the resources of the farmer, whether it be their relations to each other or to human beings in order to secure the greatest degree of prosperity to the enterprise.*

"These relations consist in (1) *relations of contact* (supplementary, complementary, or competitive) between the different branches of the enterprise, such as, for example, the simultaneous raising of cereals and animals on the same farm; (2) *relations of activity between the different means employed in the process of production*, as in the simultaneous employment of machinery and human labor; (3) *in relations of value*, between the means employed in production and the product itself; (4) *in commercial relations* with the people to whom farmers sell their products or from whom they buy goods.

"The domain of Agricultural Economics, then, covers the examination of each element of agricultural production, whether in connection with any one of the above named relationships

in particular, or with several of them together, for the purpose of obtaining the greatest net profit.

"We may consider Agricultural Economics as a science or as an art, from a theoretical point of view or from a practical point of view. If we consider it as a science or theory, it is the knowledge of the laws which govern the above named relations; if as an art or practical matter, it is the application of this knowledge in a limited, particular environment for the realization of results from these relationships."

It will be clear from this statement that Jouzier looks upon farm economics as (1) the science which treats of the principles which underlie the coördination of all the factors involved in farming (land, labor, equipments, and the various lines of production) in such a manner as will enable the farmer to secure maximum net profits, and (2) the art of applying these principles on a given farm.

Jouzier's definition may be accepted as describing that part of the field of agricultural economics which relates to the organization and the operation of the farm, but it fails to include all of the subject matter of agricultural economics as conceived in the United States to-day, and it fails to include the social point of view which needs to be considered as well as the individual point of view when recommending changes in our laws and institutions which affect the agricultural interests of the country.

Agricultural economics deals with the principles which underlie the farmer's problem of what to produce and how to produce it, what to sell and how to sell it in order to secure the largest net profit for himself consistent with the best interest of society as a whole. More specifically *agricultural economics treats of the selection of land, labor, and equipments for a farm, the choice of crops to be grown, the selection of live stock enterprises to be carried on, and the whole question of the proportions in which all these agencies should be combined.* These questions are treated primarily from the point of view of costs and prices. The economic basis for answering these questions is found in the price of land, the wages of labor, the cost of tools, machinery,

and live stock, and the prices for which the various products can be sold.

Agricultural economics deals not only with economy in production but also with the problems of justice in the distribution of wealth among the various classes of society with especial reference to the effect of the wages system, the land system, the credit system; the methods of marketing, the comparative standards of living of country and city workers, and the relative opportunities for accumulating wealth by the different classes, upon the farmer's share in the national dividend and upon the relative well-being of the agricultural population. This subject requires the attention of the agrarian statesman as well as that of the farmer. The farmer needs to understand the economic forces which underlie his success in order to help himself, and the statesman needs to understand these forces in order that he may pass helpful legislation with respect to land, labor, credit, taxation, marketing, etc., and in order that the necessary regulation of the farmer's activity may be carried out with a minimum of reduction in productivity.

While the economic principles which govern the management of farms can be formulated, it should be borne in mind that no specific *rules* can be laid down, which are of general application. Farms cannot be operated by rule of thumb. What is right practice at one time is wrong at another time, and what is right practice in one place is wrong in another. The best scientific training that could be given to farmers would comprise a *thorough knowledge of the physical and biological principles which underlie agriculture, the laws of economics which relate to agriculture, and a thorough system of accounting for the purpose of testing results on the individual farm.* Any system which purports to furnish a complete scheme of farm administration applicable to all conditions, is manifestly either Utopian or fraudulent. Such rules must be worked out upon and for the individual farm, or at most for well-defined communities where the conditions are similar.

Economics is scientifically coördinate with the physical and biological sciences in the study of agricultural problems. The

conditions and forces in the farmer's environment which influence his activities as a farm operator constitute the subject matter of agricultural investigation and education. In the early history of agricultural education, the economic aspects of the problem of the farmer received a large proportion of the space in the books on agriculture. This is true of the Roman books on Agriculture and it is true of the English works published prior to 1840.

With the development of Agricultural Chemistry, Agricultural Physics, Agricultural Bacteriology, Plant Pathology, etc., these aspects of the farm problem were brought to the foreground, and the physical and biological aspects became dominant in the publications on agriculture. The chemist, for example, has used the most approved scientific methods in his investigations. Naturally he has discredited much that was counted good doctrine on the subject of agriculture. But while they have discredited much that was once held as true, the scientists trained in the physical and biological sciences have not been able to replace the old with a complete system of knowledge for the farmer. Many of the bulletins published by experiment stations have been wrought out with great care by the specialist learned in some one science and then pieced together with the most unlearned notions regarding other aspects of the problem, and especially the economic aspects. For example, not long ago a chemist made a most careful analysis of some sugar beets grown in a given locality. He found the sugar content normal, and proceeded to draw the conclusion that sugar beets could be grown profitably in that part of the state, without giving any consideration to the quantities produced per acre, the cost of producing the beets, the cost of marketing the crop, the difficulty of securing labor, the relative profitableness of beets and other crops which would require labor at the same time of year, to say nothing of the tariff in its relation to the sugar industry. The farmers wanted an answer to the question "Will it pay us to grow sugar beets?" The chemist's work was a part, but only a part, of the scientific work required to answer the question, but to meet the demand for an answer, the wrong answer was given.

Bulletins of this character have brought home, to the men in charge of experiment stations, the truth that every problem is many-sided and that no experiment station results are ready for the farmer until the many sides have been studied by the many specialists with the requisite, preparation, and the results welded together into a harmonious statement of the whole truth about the question so far as it can be obtained.

The lack of this rounding out process means the issuing of half truths, and it is the issuing of half truths that has done much to discredit the experiment stations and to make farmers look upon scientific farming as proper fun for men of fortune, but poor business for farmers.

It is in the circle with the other scientists specializing in agriculture, devoting himself to the economic forces which influence the farmer, that the economist is finding a place. While economics deals with but one of the main groups of forces operating in the farmer's environment, yet it practically becomes the actively guiding science underlying farm management for the reason that while the functioning of physical and biological forces change but little from generation to generation, the resultants of economic forces are ever shifting, and it is necessary for the farmer constantly to watch the shifting of economic conditions; that is, the shifting of costs and prices, with a view to reorganizing his operations from time to time to fit the new conditions.

It is perhaps for this reason that some writers have used the term farm management to describe this field of research and education, which we here call "agricultural economics." This usage has the advantage of carrying some meaning to the mind untrained in economic terminology, but has the disadvantage of including much that is taught in other branches of agricultural education, and failing to convey any new and significant meaning. Literally "farm management" is the art of managing a farm. To manage a farm intelligently the operator should have a clear understanding of all the forces which in any way affect the results of his actions. Some of these forces are physical and are dealt with by the chemist, the physicist,



the geologist, the specialist on soils, or the climatologist; other forces are biological and are dealt with by the plant and animal physiologist, the entomologist, the pathologist, the geneticist, or the bacteriologist. A third class of forces which have much to do in determining what the farmer should do are social, that is, they are inherent in the relations arising among men because of the pursuit of farming as a means of making a living. These are called economic forces. Each of these sets of forces should be handled by specialists in modern institutions of education and research. If, therefore, the term "farm management" is preferred, it would be well to designate the particular phase of the subject. For example, one may properly speak of the chemistry of farm management, the physics of farm management, the biology of farm management, and the economics of farm management, in which it will be noted that the term "agriculture" as commonly used is simply replaced with the somewhat narrower expression "farm management." The solution of this problem of terminology may be to adopt the term "farm economics" as being both simple and scientifically correct.

The Report of the Committee on Courses of Study of the American Association of Agricultural Colleges and Experiment Stations in 1911 throws further light upon this subject. "The subject taught or investigated under the head of farm management, as related to the organization and management of individual estates devoted to agriculture in the judgment of this committee necessarily involves the application of the principles of economics. These principles constitute the scientific basis of farm management and give this subject its only just claim for consideration as having a pedagogical value entitling it to a place in courses of study or a scientific standing as related to problems of investigation.

"It is true that the farm manager should take into account what is taught under agronomy, animal husbandry, agrotechny, and rural engineering, but he is chiefly and essentially concerned with the application of economic principles to the conduct of his business; outside of economics there is nothing which