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Author: William Budington Duryee

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A LIVING FROM THE LAND

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(*Frontispiece*)
Country homes backed by intensive types of agriculture serve modern human needs.

A LIVING FROM THE LAND

BY

WILLIAM B. DURYEE, M.Sc.

Secretary of Agriculture,
State of New Jersey

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To my friend
Henry W. Jeffers

PREFACE

[Pg ix]

HOMESTEADING days are here again. The present movement of people back to the land is of a different type and has different objectives from those which prevailed when a continent was to be conquered and exploited. Today we know that many urban industries will operate on a seasonal basis and we know too that periods of unemployment and shorter working days will provide more leisure and probably lower incomes for hundreds of thousands of families. The utilization of this leisure time to supplement incomes, to raise the standards of living and of health, and to attain some measure of economic security will tend more and more to settlement on the land.

In these days of rapid transportation and all the attributes and conveniences of modern country life, the hardships of the earlier period of land development are non-existent. Although urban industrial development has reached a point which will not be exceeded for many years to come, the individual who needs additional income may adjust himself to such circumstances by establishing a country homestead. Industrial activity is tending to decentralize, largely as the result of widespread power distribution, and a home in the country accessible to some form of manufacturing or business employment offers undeniable attractions.

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This book is prepared primarily for the family that is inexperienced in country living and in soil culture. Such a family should know about the nature of the soil on which it lives, how to make it serve the family's needs and purposes, what to do, and what to avoid in order that success may be attained and failure averted. Students of agriculture as a vocation and practical farmers may find, beyond the elementary facts presented, information of value and help to them. To know and to understand the science and practice of agriculture is to have power to cope with and to enjoy soil culture and animal husbandry. If this little volume helps to answer clearly and definitely the many inquiries that are in the minds of prospective and active homesteaders, it will have served its purpose.

The knowledge of many practical people and the resources of agricultural institutions and agencies have been drawn upon for this book. Grateful acknowledgment is made to those who have contributed constructive criticism and have helped in the preparation of material. Especial credit is due to the personnel of the New Jersey and New York colleges of agriculture and to my associates in the New Jersey Department of Agriculture.

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William B. Duryee.

Trenton, N. J.,
December, 1933.

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A LIVING FROM THE LAND

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Chapter I

TURNING FROM THE CITY TO THE COUNTRY

AMERICA was founded on the rock base of agriculture. The early settlers tilled the soil and derived from it the simple things that they needed. Necessity compelled them to be self-reliant, courageous and resourceful. The establishment of a home in early days meant the clearing of land, the erection of a house for human habitation and the building of shelters for a few farm animals. Each farm home became practically self-sufficient so far as the family needs were concerned. Clothing was made there for each member of the family. After clearing and subduing the land, the settlers were able to produce their cereal foods. Animals were slaughtered and the meat processed to provide sustenance throughout the year. Through the exchange of commodities and ideas with neighbors, advances in living conditions were made.

The family that was not resourceful in those days failed to survive. Neighbors were too busy working out their own existence problems to succor the incompetent. Resourcefulness was called upon in meeting onslaughts of beasts or human marauders. Thus there was built up a tradition of seeking and utilizing resources that has gone on to make our country great and the wonder of the rest of the world.

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Since pioneer days we have built a great industrial, commercial and financial machine. American inventive genius, coupled with the best brains of the civilized world, attracted by resources and opportunities on every hand, has invaded every field and created a great industrial superstructure.

With the genesis and development of a great industrial era in the United States there started a movement of population from farms to established centers of population. The application of the sciences to the problems of filling human wants gave this movement greater impetus. Mining and the refining of metal ores, the exploiting of coal deposits, the building of railroads, the construction of buildings for business and residential purposes, as well as dozens of other great enterprises, served to draw from the country the best of its human resources.

Inventive genius began to concentrate on the solution of engineering and construction problems created by congestion of population and successive steps in industrialization. This same technical genius was applied also to farm operations which required laborious effort by men and work animals. That this development itself progressed rapidly is demonstrated by the fact that while in 1810 the effort of nearly every person was required to produce enough food to sustain the population, in 1910 the efforts of one-third of the people were sufficient to provide food for the nation and export vast quantities to other countries.

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While the nation continued to grow rapidly in population and sought to apply to ordinary practices the newer labor-saving devices, all was well. It was inevitable, however, that the great industrial machine should become over-developed, at least temporarily. Instead of machinery being a servant of mankind it became an octopus that could not be checked. Individual initiative, the wellspring of earlier developments in the process, became atrophied. There came about such a high degree of specialization in human effort as to make men dependent upon others for work to

do. Consequently, even a slight throwing out of gear of the machine created unemployment, which reduced buying power for the machine-made products and started a vicious downward spiral accompanied by every form of economic distress.

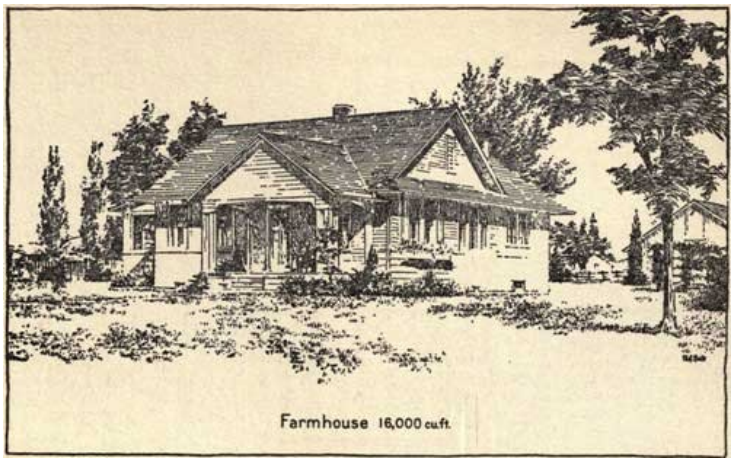
When such partial or complete breakdown of the superstructure occurs, thoughtful people are brought “down to earth,” both collectively and very intimately in thousands of individual cases. They begin to get back to fundamentals and to seek means of becoming so reestablished as to avoid future cataclysms. The family attracted to the city by the lure of high industrial wages and by crowded avenues finds in such a breakdown that it has lost its moorings. [Pg 6]

In seeking means of reestablishment free of the terrifying complications of industrial life, the mind turns to the country, to the soil, to growing things that are not visibly affected by economic cycles. The open country seems ready to welcome back her errant children graciously and to enfold them within her protecting bosom. We cannot go back, however, to pioneer days. Free land is not available and we have not the arts or the patience to practice the means of livelihood of those days. To make the new or renewed relationship with the soil a success, it is necessary to understand that country life, too, has changed during industrial revolutions. Mother Earth is now, as ever, a generous but exacting parent. To try to reestablish relationships in a blind and haphazard manner is likely to lead to further disaster. Such a debacle is quite needless, provided some fundamental principles and practices are understood and followed. [Pg 7]

Unquestionably, the open country is now making the greatest appeal as a place of residence that it has made at any time in the history of the nation. To list the conveniences which now exist in the country is to duplicate those which many people have considered as available only in cities. In most areas of the country, for example, there are daily mail delivery, telephone service, some measure of fire protection, and transportation by automobile, bus or train. It is quite possible, for example, to step into a bus at one’s dooryard and be carried to any part of the United States by the same method of transportation.

The development of the radio has brought to the country home all the surging activities of national life and varied educational and entertainment programs. The spread of electric light and power lines through the country constitutes a boon that makes possible the use of all kinds of electrical appliances known in the city, including refrigerators, cooking ranges, washing machines, water pumps, water heaters and hundreds of other machines and appliances, some of which are in their infancy. No great difficulty is experienced in locating in the open country where such electrical facilities are available.

[Pg 8]



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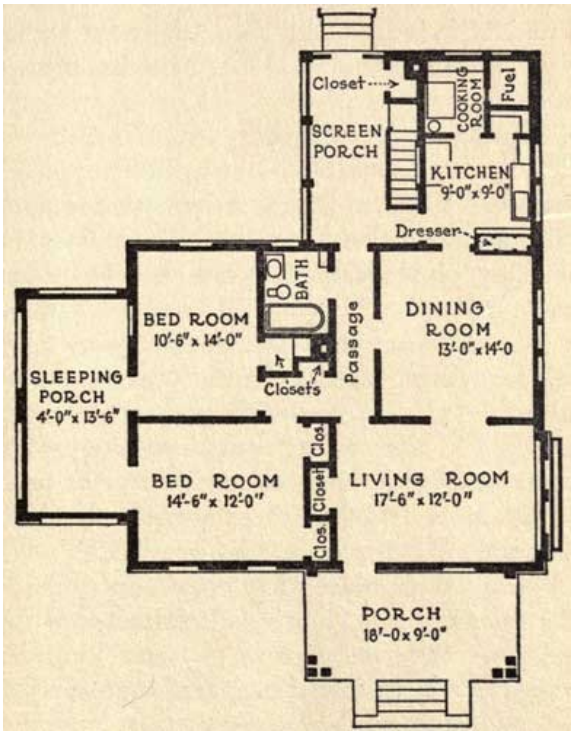
(*Courtesy U. S. Department of Agriculture*)
An attractive farmstead offering requisites of a home in the open country.

[Pg 9]



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(*Courtesy U. S. Department of Agriculture*)
Floor plan of house shown on opposite page.

On the main highways in the northern sections of the country a heavy fall of snow used to mean isolation for weeks. Today the snow is removed as rapidly as it falls, and these highways are kept open. The problems and perils of isolation are thus removed. [Pg 10]

Tradesmen of all kinds are directing their sales toward country homes, and supplies of ice and all kinds of food can be obtained almost daily at the farm doorstep. There is also a tendency to develop factories in the country away from the high-rent areas of cities and to utilize the services of persons living in the vicinity of the factory for full or partial time in the plants. The cost of living can be reduced by living in the country, and opportunities for purchasing foods and other products at wholesale prices and storing them against the time of need make further economies possible.

The greatest asset that the country has to offer relates to the health and character of those who live close to nature. It has long been recognized by many European countries that the ownership of even a small tract of land, no larger than a city lot, perhaps, is a definite asset in building a nation and in building individual character. In Germany, in Denmark and in many other nations, the government lends its aid toward the establishment of people in the country and makes it possible for them to acquire and retain small holdings of land which they may call “home.” It is on these small tracts that one sees veritable bowers of pastoral industry and beauty. [Pg 11]

Residence in the open country, in contact with the soil, contributes to physical strength and to mental health. When a man lives in the country, his house, his way of living and his contribution to the community stand out where all may see them. These latter assets have always been inherent in country life. When to these are added the conveniences and the opportunities for community enjoyment that are now a part of rural life, its appeal is not difficult to understand.

Anyone who intends to live in the country has his individual problems to meet and to solve. In the solution of these problems there are many resources and avenues to which he may turn in the present day for help and for guidance. The tragic mistakes that have been made in the past can and should be largely eliminated in the future. A clearer understanding should be gained as to what one may obtain in the country in the form of a better way of living, serving as an anchor to the windward even under favorable economic conditions.

Chapter II [Pg 12]

GETTING ESTABLISHED IN THE COUNTRY

IN THE selection of a residence in the country, the settler must decide whether he wishes to locate on a farm of considerable acreage or whether he wants to have a relatively small tract ranging from 2 to 15 acres. In the latter case, he is thinking primarily of a place of residence with

sufficient acreage to make it possible to secure a partial living from the land immediately surrounding the home. The trend in such purchases is toward the smaller place for a number of reasons.

A large farm acquired by a relatively inexperienced person means a very considerable burden in the development and maintenance of the land itself on a producing basis. Capital is required for the purchase of equipment and power. Parts of the land may need to be drained, and taxes must be paid whether the land is productive or not. A person acquiring a farm of 50 or more acres will find that the major portion of his time, thought and capital will be called upon to make it a [Pg 13] success. If he has definitely cut off his city connections and the idea of having a job there, and has had experience in farming, then he may be in a position to take over a large acreage so that his full time and possibly that of other members of his family can be spent on various projects on the land he acquires.

We are here primarily concerned, not with those who desire to enter upon farming on a large scale, but with the family which would like to live in the country, secure a partial living from the land surrounding the home and still have the opportunity of gaining a livelihood from some industrial or commercial activity located in a near-by city or town. It is quite likely that we shall have a shorter working week and probably periods of unemployment for hundreds of thousands of ambitious people. Therefore, a place in the country that is well located with respect to hard-surfaced highways and accessible to urban centers offers opportunities for combining the advantages and economic assets of country life with urban employment.

Getting Started Right.—Too much emphasis cannot be laid upon getting the right start, particularly with respect to location. This is not only essential for the satisfaction of the present occupant of the premises, but also gives definite sales value in case circumstances make a change [Pg 14] of location desirable or necessary.

It will often appear that the best location is on the outskirts of a city or town and from some angles this is good reasoning. There are some factors, however, that make such a location undesirable. For one thing, the tax rate is likely to be higher in such areas than in the open country, thus adding to overhead without compensating advantages. In the second place, urban centers develop without regard to soil type and this is an essential factor to the family that expects to engage in some agricultural pursuit. Again, the type of inhabitants that live on the fringe of towns and cities may not make good neighbors or associates for children, especially. None of these disadvantages may be present in locations close to centers of population, but the prospective settler should give all these factors full consideration. The sales argument frequently advanced that such locations will grow in value due to growth of population may be fallacious.

Many have found that the higher costs of living in these areas often prevent the owner from holding on until the slow growth of population outward makes a worth-while profit possible from his real estate. Furthermore, the growth of cities and towns is definitely slowing down. The [Pg 15] expansion of city areas is greatly curtailed and is not likely to be resumed soon.

The most important time to get expert opinion as to location is at the beginning and not after purchasing. There are available in every locality persons whose advice is useful in such matters. The county agricultural agent located in nearly every county seat knows the countryside and his advice on the subject of definite location should be sought once one has decided upon the general area which seems attractive. In determining on specific location the bank which has a clientele in the country will often be found a helpful guide through suggestions or through ability to refer the questioner to reputable and informed persons with more definite knowledge.

Another source of information is the local dealer in farm supplies. He will be found to know general soil types in the vicinity, especially those types which bring business to him because they are productive. Owners of such land are able to buy and use to advantage the supplies he has to offer to the grower.

Size of Tract.—There is the possibility that a person who goes back to the land may acquire too little land as well as too much. Inadequate land resources may seriously hinder possibilities of revenue from the place and cramp facilities for his enterprises. In this connection it may be [Pg 16] helpful to point out that an acre of land comprises 43,560 square feet. A city lot measuring 50 by 100 feet contains 5,000 square feet. An acre therefore would comprise about eight and one-half such city lots. A 5-acre tract is usually a minimum area for a small agricultural enterprise and many have found it entirely adequate.

The size of the tract to be acquired and the enterprises that can be engaged in will depend in considerable measure upon the size of the occupant's family—whether they can assist in its operation and whether the owner himself intends to put in all or only a part of his time. The possibility of securing extra labor should also be looked into before larger operations are attempted. No definite formula can be set down for desirable area and enterprises in relation to time available for operating. However, the owner will realize that one pair of hands can do only so much work. To try to operate beyond the capacity of his own time and that of others available is to become involved in striving to keep up with exigencies that may make country life a struggle instead of a pleasurable existence. It may result, too, in losses due to inability to get things done on time, and nature deals harshly with those who neglect the seasonable operations that come in any agricultural enterprise. "Bulling through" or skimping or cutting corners simply will not work [Pg 17] when one is dealing with plant and animal life and only failure will come to him who undertakes to bluff nature.

The successful operator of a farming endeavor must always be on top of his work, that is, able to plan and direct his energies in the most productive way at the right time. This is really managing and is likely to lead to success and satisfaction. To have so much to do that one emergency after another must be met brings the operator down under his farming projects. He ceases to manage

under these conditions and becomes driven by his own creations. To avoid this unhappy state, which is entirely unnecessary, planning must be effectively done and operations undertaken in a gradual way up to one's capacity.

Cost of Land.—The price one should pay for land in a relatively small tract cannot be arbitrarily fixed. Those who own large farms or tracts expect to receive a bonus for the acres located along a highway as compared with an average price for the entire place. It should be possible to buy a 5- or 10-acre tract of land in the open country with highway frontage for from $150 to $250 an acre, depending on location. If the land is located near town or city where speculative operations have enhanced values, the cost will be considerably more. Where an entire farm is desired, the [Pg 18] buildings are frequently given no value, the cost being the price of the land only. As has been stated, it is quite possible to acquire too much land as well as too little. A few acres selected from a tract of good, productive soil will usually be found a better investment than a large farm that has been abandoned because of lack of fertility.

Accessibility to Cities.—In deciding upon the location of a farm, methods of transportation that are available are as important as nearness to cities. A location near a railroad station offers the possibility of low commutation rates to a point of industrial or commercial employment. A location abutting upon an improved highway means that transportation by bus or by personally owned automobile can be utilized at the least expense and trouble the year round. The recent development of bus lines covering almost every main artery of travel offers facilities for quick and economical transportation unknown to country residents even a few years ago. Furthermore, the selection of a place of residence accessible to transportation to and from it is a factor to be borne in mind in connection with the possible resale of the property, should that at any time be desirable or necessary.

The Soil.—The type of soil is a highly important factor in determining upon location; also [Pg 19] important is its crop-producing capacity. For all general purposes, a soil which is loamy in texture is desirable. Types to be avoided are the extremes of clay and sand. A heavy clay soil, particularly where the land is in a depression, not only inhibits plant growth of all kinds but is often undesirable as a place of residence from the standpoint of healthfulness. A condition of extreme muddiness in wet weather creates an unpleasant reaction on those forced to live near it. On the other hand, areas which are so sandy in character as to furnish no fertility for the growth of plants will be found undesirable in making the surroundings of the home attractive and in growing the vegetables and fruits which should constitute a part of the living.

One method of judging the soil consists of examining the vegetation that is already growing upon it and determining on that basis whether it is likely to be favorable for the growth of desirable plants. For this reason, the selection of a site during the growing season is recommended, rather than during a dormant season when it is difficult to form an estimate of the vegetation that the soil will support.

Availability of Electricity.—While it is possible to secure individual electrical generating plants, it [Pg 20] is far preferable to establish a home where electric lines may be tapped. The obtaining of electrical energy from a commercial line is desirable because of its greater dependability, generally lower cost and the fact that unlimited use of electricity may be obtained without the overloading that frequently occurs where individual plants are set up. Probably the availability of public utility lines is the greatest asset of comfortable country life and one of the most important factors in creating genuine resale value. These lines bring to the country dweller most of the advantages that are enjoyed by city residents. This is true not only because of the advantages of electric lights, but also because electricity makes possible the use of such modern appurtenances to the home as electric refrigerators, washers, radios, water pumps and various devices and machines for use in connection with poultry keeping and vegetable growing.

Type of Buildings.—Especial attention should be given to the adaptability to the buyer's needs of the residence and the other buildings that may already be in existence. If the plot being considered is on a main highway, it is highly desirable to have the residence located back from [Pg 21] the highway a hundred feet or more as a means of eliminating noise and promoting safety especially if children are in the family. The location of a home directly on one of the main arteries of traffic destroys many of the advantages of country life, owing to the distracting noises that accompany intensive truck and passenger traffic.

The age of buildings and their previous care have a direct relation to their value, particularly if they are of frame construction. If the buildings have been standing for a number of years, full allowance must be made for depreciation and repairs incident to weathering and long usage. The actual investment represented in a building erected under war or post-war conditions may not be in line with present values. In measuring the value of the principal buildings that are already on a tract, careful consideration should be given to the cost of replacement. Consideration should be given also to the outbuildings that may be on such a place. Instead of being an asset to the property, they may be a distinct liability if they are not directly useful to the intending purchaser. From the standpoint of economy of maintenance and generally good appearance, it is much better to have one building serve a number of purposes than to have a number on different parts of the [Pg 22] property, adding to the cost of maintenance and multiplying steps.

Educational Facilities.—Where there are children in the family, the location of schools and the facilities which they offer should be investigated by the prospective buyer. It is desirable to locate as near to schools as possible. In recent years there has been a strong tendency throughout the country to do away with local schools and to consolidate educational facilities in one building. Coupled with this trend is the free transportation of pupils to consolidated schools. Therefore, it is highly important to locate either near a school which will be kept in operation or where transportation facilities are available to and from the home and the school. It should be said that the trend toward consolidation of schools has carried with it great benefits to children who live in

the open country by affording them educational facilities that are not exceeded by most city schools.

Community Advantages.—The community, in addition to educational facilities that are available, should include those opportunities that appeal especially to the family. The accessibility of the church of one's preference should not be overlooked, and the general type of community life is highly important too. Some communities are known for the law-abiding proclivities of their [Pg 23] residents while others do not have a savory reputation from the standpoint of the peace and security of their more respectable inhabitants. One should establish a residence in the community with the thought that he is to become a factor in the life of that community. He should be sure that there is a genuine spirit of healthy and cooperative activity which constantly tends to upbuild the neighborhood, by keeping out or suppressing undesirable elements and by developing a concerted feeling of responsibility for the welfare of all who live within its boundaries.

A resident of a city moving to the country frequently finds a difference in his neighbors' viewpoint that surprises him. There is, and must be, in the rural community a closer relationship between the people in that community than ever exists in an apartment dwelling in the city. In the country, one's neighbors are apt to show a surprising amount of friendly interest in one's doings, since the whole trend of the community is based upon the actions and attitude of the relatively few people who live within it. It should be repeated, therefore, that the type of community and the facilities which the people of that community have developed should be given careful attention by the prospective resident and he should determine for himself whether the particular community that [Pg 24] he has in mind is in accord with his ideas and ideals. To be out of step with the community in which one lives is apt to create dissatisfactions and a critical attitude on both sides that is not conducive to happiness.

A home in the country has more of the attributes of genuine ownership than has a home anywhere else. The country home must be established with an idea of permanence and of becoming really rooted in the soil where one locates, if the true benefits of rural home ownership are to be secured.

Do's

Decide either on large farm or on house and small acreage.

Determine accessibility at all times of the year.

Purchase soil of loam texture, mixture of sand and clay.

Determine whether electricity is available.

Locate back from highway.

If present buildings are to be used, be sure of their condition and need of repair.

Find out type and accessibility of schools and other community buildings.

Prepare to be *of* the community as well as *in* it.

Remember there are advantages of small tract over large farm where available time is an important element.

Use local sources of information as to desirability of tract before purchasing.

Work out a plan of management that fits into the time [Pg 25] available for the farm duties.

Don'ts

Don't overlook intrinsic values of the location, such as soil, low tax rate and good neighbors.

Avoid excessive capital outlay.

Avoid extra heavy or extra sandy soils or evidently unproductive ones.

Don't overlook advantages of electric light and power.

Don't buy a place just because it has buildings. They may not be adapted to your needs.

Don't buy too much land. It can be a burden.

Don't let the farm become your master.

Don't pay too much for land. There is plenty of it.

Chapter III

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FINANCING AND PROTECTING THE INVESTMENT

ACQUIRING land for residence and for subsistence calls for the exercise of good business judgment. Not only must the site and general location be acceptable to the family, but the investment involved should be within the capacity of the owner to finance without undue strain on his resources. It should be recognized that there will be ordinary living expenses to be met in the country and perhaps some extraordinary demands resulting from emergencies. Consequently, adequate thought and preparation must be made for financing the investment and making sure, as far as that is possible, that the investment in a country home will not be lost through inability to meet possible contingencies.

It goes without saying that the capital investment should be kept as low as possible. Wherever feasible, the cash available should take care of the full investment without the necessity for additional financing. This reduces the drain upon resources through obviating the necessity of [Pg 27] meeting interest payments on mortgages and makes possible the use of any surplus funds for improvement, for education and for giving the family the advantages which country life offers. If it is necessary to borrow funds for financing the purchase, special attention should be given to the type of mortgage which is obtained.

Mortgage Financing.—One of the most desirable types of financing is through a financially sound building and loan association whereby the interest and the amortization of the mortgage are taken care of through monthly payments. Such building and loan mortgages are available in most localities throughout the country. A series of monthly payments can be made which will take care of the interest payments and the mortgage itself so that within a period of from ten to twelve years, in most cases, the mortgage is amortized and the owner has the advantages of a home that is free of encumbrance. For example, if the mortgage amounts to $3,000, subscription to fifteen shares of a building and loan association at $1 a share per month would make it possible to clear off the mortgage in about eleven years. This would call for the payment to the association of $15 per month and interest. Through the compounding of interest, the mortgage can be lifted at less [Pg 28] expense than any other procedure.

Another satisfactory plan is to place the mortgage with a bank or financing company or insurance company that will not call the mortgage so long as the payments are met, and at the same time start saving through a building and loan association so as to complete the payments over a series of years.

There is a far greater sense of security in having no mortgage or in setting up a definite and practical procedure for eliminating it than in always having a mortgage encumbrance with its interest payments and the possibility of having it called at an inopportune moment. A home that is free from mortgage can be carried at small cost, especially where the owner is willing to make most of the repairs and attend to the upkeep himself. The demand for outlay of cash for mortgage interest may be financially embarrassing, especially where income is not guaranteed or may be jeopardized through a drastic reduction at critical periods or as the result of emergency expenses in the family, such as are entailed by serious illness.

Taxes.—One of the factors that is frequently overlooked in the purchase of a residence in the country is the cost of meeting taxes. Since taxes must be met if the property is to be held, it is [Pg 29] highly important that the location be one in which tax rates are not excessive. On the other hand, an exceedingly low tax rate may indicate lack of progressiveness in the community and lack of facilities which from many angles would lessen the value of the tract as a place of residence. In most localities, the tax rate is based principally upon the costs of building and maintaining highways and schools. Good facilities in both of these respects are highly desirable, and yet excessive expenditures in either direction may so advance the tax rate as to make them expensive luxuries.

In many rural communities, taxing districts are burdened with the costs of building monumental schools or a very elaborate system of roads, undertaken at some time through the flotation of bond issues. The establishment of a sinking fund for payment of interest and amortization of these bonds frequently constitutes a very heavy drain upon the residents of the district. It is, therefore, necessary to determine not only the tax rate in the locality under consideration, but also to know definitely what are the current charges for maintenance of government. Taxing methods vary so widely, even in adjoining districts, that the only method of determining the annual charges for taxes is to secure from the present owner or from the local tax assessor the definite payments [Pg 30] that must be made.

As a means of saving trouble later, an investigation should be made of the property under consideration to make sure that taxes have been paid to the date of purchase. This is distinctly the obligation of the owner. Unpaid taxes constitute a lien on the property, and an investigation of the status of the tax payments is essential in protecting the proposed investment.

The Title and Survey.—A great deal of possible trouble can be eliminated by making sure that the title is clear. An investigation should be made along this line by an attorney or agency equipped to secure information from appropriate county offices. Very often the owner has had a recent search made and is willing to pass this on to the purchaser, thus saving expense and delay in tracing back the records over a long period of years. Such study will show whether there are encumbrances or liens of any kind on the property, and these, of course, must be cleared up before any transaction is entered into.

The potential buyer should also have a survey made by a competent engineer to definitely fix the boundaries of the property. Stakes can then be placed, indicating the corners and any irregularities in the outline of the area under consideration, showing the new owner exactly [Pg 31] where his property extends. In many sections of the country the buyer is in a position to demand of the owner that such a survey be made at the owner's expense. This survey is particularly important where an area of considerable size has been cut up into parcels for sale to individuals.

The steps that have been outlined to protect the investment are only those which a prudent purchaser will insist upon before transfer of ownership takes place. Frequently a buyer becomes so enamored with a property that he hopes nothing will interfere with his acquisition of it, and he is apt to mentally minimize the possibilities of a cloud on the title or the exactness of the property lines. So many people have suffered serious losses from failure to look thoroughly before leaping that emphasis is given to these points as a means of securing ample protection for the buyer.

An Income from the Investment.—It is presumed that in most cases the owner of even a small tract expects to secure some financial returns from the land as a means of adding to his income. The plan that is proposed as a means of securing an income from the land should not be too complicated and should be of a type that can be carried on when the owner is necessarily [Pg 32] engaged in other work. This, of course, may run the gamut from a small home garden to supply the vegetable needs of the household to the operation of a larger tract on a commercial basis. Furthermore, as we get into the commercial type of production, that may be planned as a means of materially supplementing an income or eventually supplying the entire family income.

Especial attention has been given in recent years to the use of poultry as a means of supplying an income to the family which is willing to use its own resources for taking care of the flock. Another means of securing an income is the growing of vegetables and the sale of these vegetables at a stand erected near the house for the convenience of the traveling public. Many who engage in vegetable growing or egg production on a relatively small scale will find an outlet for their products through associates in some other line of work, who will be glad to buy from their country friends on the basis of quality and freshness that may not be obtainable through their community stores.

It should be pointed out that where the area under cultivation is small, the production must be intensive. In other words, it would be uneconomic for the owner of a small tract to try to supplement his income through the growth of staple crops. He must specialize in some particular [Pg 33] phase of agriculture, horticulture or animal industry that will bring the largest possible net returns per acre even though that implies a considerably larger labor cost per unit of operation than would be the case in the growing of the staple crops, such as the cereals. The successful production of vegetable crops or poultry products, for example, and their successful merchandizing, rest primarily on the interest and the adaptability of the individual.

Avoiding Causes of Failure.—To know what procedures to avoid is to be fortified against failure and to be prepared to take advantage of those constructive measures which are conducive to success. A recent survey has been made in an eastern state on the causes of failure in farming, frequently followed by necessitous abandonment of the farm and home. This survey shows that one of the principal causes of failure is the effort to manage a farm that is too large for the operator's capacity; his inexperience and lack of knowledge constitute too great a handicap on a large acreage. Best results can be secured in farming only by seeding, cultivating and harvesting at the proper time in each case. To a greater extent than is usually realized, success depends upon good management, which means doing the things that need to be done at the right time. [Pg 34]

If the farm is large there is a necessity for employing hired labor, and the costs of this labor, especially under inexperienced management, are likely to be out of line with the value of the products raised. In many instances the lack of technical experience can be corrected by dependence upon governmental agencies, such as experiment stations, county agricultural agents and departments of agriculture. These services are available to every farmer, in most cases without cost, and all that he needs is the will to avail himself of such expert help. In the cases of farms that have been abandoned, we find that the operators did not make contacts with dependable sources of information, an indication of the necessity of cooperating with the agricultural agencies or with experienced and successful neighboring farmers.

Still another cause of failure lies in the purchase of a farm at a price which requires the assumption of a mortgage which is too high in relation to the income from the farm. In short, an attempt to operate on an overcapitalized basis will, sooner or later, lead to disaster. Failure to locate on a productive type of soil may easily lead to loss of the investment. If the local conditions, [Pg 35] including good roads, school advantages and a healthy community spirit, are lacking, there will develop a feeling of discouragement and mental dissatisfaction which destroys morale and creates the desire to get out from under at any cost.

The Stocked Farm.—The question is frequently raised as to whether a farm should be bought already stocked with work and domestic animals and with farm equipment or whether it should be stocked by the operator himself. This will depend, of course, upon the type of equipment which may be available in the individual case. Sometimes fairly good equipment will be sold with the farm as a means of facilitating a sale, but the value of each item should be determined by someone experienced in prices of such livestock or commodities as may be sold with the farm.

In many cases the buyer has loaded himself with animals or equipment that are ill adapted to the farm or that are of no particular value, and in struggling to get along with them he may seriously handicap the efficiency of his labors. In most cases it will be found a better practice to add stock and equipment as the need becomes definite and the finances of the operator make it possible for him to add them to the farm. In this way he will be fairly sure of acquiring only those items which [Pg 36] will be of direct use and benefit to him and will avoid an accumulation of worn-out or antiquated

articles which will not meet the requirements he must observe in selecting tools for his work.

Avoiding Fire Loss.—Possibility of loss by fire is an ever-present reality to the owner of a country place. There are two methods of preventing loss, and the observance of both will contribute to the peace of mind of the owner.

In the first place, he should make sure that adequate insurance is carried on his buildings and equipment so that in case of loss through fire there will be sufficient indemnity to permit the rebuilding of the destroyed or damaged structures. Lightning heads the list of the causes of farm fires and is frequently not reckoned with by urban residents who have seen little evidence of its destructiveness. In cities, points of electrical concentration are avoided by diffusion through piping, metal poles and a number of other conductors of electricity. The owner of a country home can secure quite complete protection from damage through lightning by the use of electrical conductors, usually called lightning rods, properly installed. Such equipment does away with 90 per cent of the risk caused by lightning.

In installing a system of lightning rods, it is well to observe a few simple precautions. The most [Pg 37] exposed parts of a building should be provided with rods and the rod points should extend 3 to 4 feet above the structure. Conductors from the rod point should go in the most direct line possible to the ground and sharp bends in the conductors should be avoided. One of the most essential precautions is to thoroughly ground the conductors. Water pipes on the buildings furnish excellent grounding. The grounds for the conductors must be deep enough in the soil to reach permanent moisture. Lightning rods that are not properly constructed or properly grounded may be a worse menace than if no such protection is attempted. Specific methods of protecting farm buildings from lightning damage can be secured from state agricultural agencies or from reliable commercial firms which make a practice of erecting them.

Another cause of fires lies in unsound chimney construction. By using care and the proper materials in the building of chimneys, fire may be avoided. Chimney bricks should be laid flat rather than on edge, thereby practically eliminating the development of chimney cracks through which sparks can escape into floor spaces, attics and roofs.

Fire risks to residences and other buildings can be reduced by building the roof of fireproof or [Pg 38] fire-resistant materials. Wooden shingles, while attractive and inexpensive, may become so dry at certain seasons of the year as to furnish tinder for sparks that may rise from a brush fire or from burning buildings in the vicinity. The use of slate or asbestos shingles is recommended for roofs and there are other materials now on the market which have fire-resistant qualities and can be safely utilized. Flying sparks carried along on high winds constitute little menace to those who have equipped their roofs with non-inflammable materials.

It is important to see that electrical wiring has been properly installed, and for this purpose it is safest to secure expert help. If the menace of fire is properly evaluated by the owner, he will naturally take suitable precautions to cope with it, both through utilizing adequate preventive measures and through having available equipment to make possible the smothering of accidental fires which may develop. The application of these available common-sense methods of fire prevention will practically eliminate the fire risk. An ounce of such prevention effort is to be stressed rather than placing dependence on means of fire suppression after the combustion occurs.

Do's [Pg 39]

Keep capital investment as low as possible.

If part of capital must be borrowed, select type of mortgage that can be paid off most conveniently.

Determine tax rate before buying.

Make sure that title is clear and the property lines definitely fixed.

If some income is expected, check on possibilities of location with that in mind.

Plan to secure income from intensive crop and animal projects, *e.g.*, vegetables and poultry.

Use governmental aids to the fullest extent.

Carry adequate insurance on buildings, equipment and furniture as protection against fire loss.

Install protection against lightning.

Be sure electrical wiring is properly installed.

Don'ts

Don't become heavily involved with fixed financial obligations at outset.

Avoid localities with heavy bonded indebtedness, resulting

in excessive taxes.

Don’t expect to get an income from growing staple crops such as grains.

Don’t become dependent on hired labor if it can be avoided.

Avoid unproductive soil and top-heavy investment of capital.

Don’t buy a stocked farm unless the stock is adapted to needs and properly valued.

Don’t neglect to take every precaution against fire.

Don’t forget chimney flues are potential risks.

Avoid roofs of inflammable materials.

Chapter IV

[Pg 40]

ATTRIBUTES OF A HOUSE IN THE COUNTRY

THE PROBLEM of selecting a home is always a serious one. Success in choosing a satisfactory location and home in the country calls for careful study and good judgment throughout the procedure. In urban centers many services are taken for granted, such as water supply, sewerage, public utility connections and delivery systems. The establishment of a home in the country calls for the consideration of all these services. Some may not be available and preparations must be made to do without them or to set up such procedures as will take care of the family’s needs on the basis of the individual home.

The Rural Home.—To give the elements of satisfactory living under modest circumstances, the country home should be so located and serviced as to give the maximum of comfort and convenience for the money invested. The location, type of construction and interior arrangement of the home are important factors in attaining these objectives.

[Pg 41]

Unless the location selected already has buildings on it which meet the needs of the purchaser and his family, there will be the immediate problem of building the home or remodeling the structure already in existence. In recent years a great deal of attention has been given to rural homes, stimulated no doubt by the very evident trend of population from the city to the country. These homes should have attributes distinctly their own and should harmonize with the purpose and the location in mind. A house with lines that look well in town or city may be only a blot on the landscape when set in the open country. Many excellent recommendations have been made for country houses by the United States Department of Agriculture, the President’s Conference on Home Building and Home Ownership (December, 1931) and by architects who have given this problem the specific attention it deserves.

In general, we may say that the exterior of the house should have simple lines and should not be ostentatious or covered with inappropriate decorative effects. This is especially the case where the house is comparatively small and is located in the open country where there is a simple and pleasing natural background. The country house should be low and broad, rather than tall and narrow. The windows and doors should be of a size and shape that will meet utilitarian requirements and be so situated as to give a pleasing and attractive appearance to the whole structure. The materials used should be selected to meet the needs of economy in the original construction and should be of long-lasting type, assuring economy in maintenance.

[Pg 42]

Essential Requirements.—In planning the house there are certain minimum requirements which should be kept in mind. For example, the sleeping facilities should include at least one bedroom for every two persons and should contain not less than 100 square feet per room. All sleeping rooms should be provided with cross ventilation, that is, with a window on each of two sides, and sufficient closet or wardrobe space should be provided, equipped with shelves and hangers for taking care of clothing. Ordinary lighting facilities for each room include at least one window, with the kitchen, living room and sleeping areas preferably having two. Windows should be so placed as to permit direct sunlight to enter at least three-fourths of the rooms. There should be daylight and artificial lights on all work surfaces such as the stove, the sink, work tables and in the family reading center.

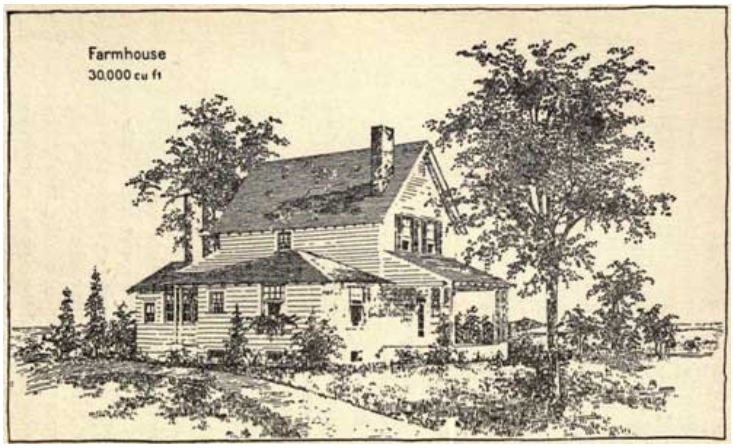
[Pg 43]

Especial attention given in advance to the kitchen will be more than repaid by the convenience and efficiencies secured. There should be ample built-in kitchen equipment for small and large utensils, kitchen tools and linens. Ample lighting devices should be employed and step-saving arrangements provided so as to eliminate as much effort as possible in carrying out the daily duties that are conducted in this important part of the country home.

Where the funds available for construction or remodeling are limited, it is important to know what the cost will be before the job is started. This procedure calls for a plan which will show the exterior appearance, the interior arrangement, and the cost of the completed job. Plans can be

secured from many sources in addition to those already mentioned. Persons with architectural experience and ability may often be employed directly to plan the house and to supervise its construction. If the prospective builder wishes to select his own plans and to know in advance the complete cost, he can secure from processors of lumber a catalog of plans which are accompanied by costs of every item needed. Such processors cut the material to fit at the factory and identify each piece so that the mechanically minded man can do much of the work himself with help he may employ. These companies will also quote prices on the cost of erection by their own employees in addition to the cost of materials. The outlay needed for lighting, plumbing and heating facilities can also be obtained from the same source.

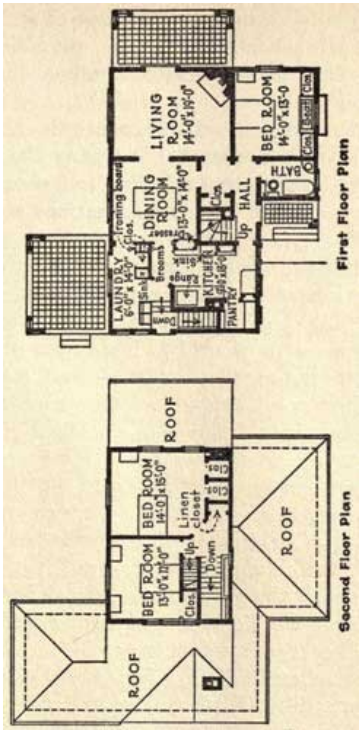
[Pg 44]



Larger Image

(*Courtesy U. S. Department of Agriculture*)
A modest country home.

[Pg 45]



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(*Courtesy U. S. Department of Agriculture*)
Floor plans of house shown on opposite page.

[Pg 46]

Another method of procedure is to draw a plan of the house that contains the rooms considered necessary, submit such plans to a lumber merchant and get quotations on costs of various types of material necessary to construct it. Such construction will usually require the services of a skilled carpenter and mason but permits of more latitude in most cases than is available under a set building arrangement.

Types of Country Houses.—Illustrations of small houses suitable for the country are shown on pages 8 and 44. The floor plans of these houses are shown on the facing pages. There are many other types of small houses adapted to use in the country and the selection of any one is largely a matter of individual preference and ability to finance.

Because of the variation in prices of material in different locations, the kind and quality of material that the owner may desire and also the amount of labor that may be furnished by the owner, it is difficult to give in definite terms the cost of various types of buildings. Estimates of

costs of materials and construction may easily be obtained from contractors in the vicinity. [Pg 47]

Simply with the idea of giving approximate costs, the Conference on Home Building gives the following cost bases for building frame dwellings, obtained roughly by multiplying the volume by the cost per cubic foot. Naturally the cost will vary in different sections of the country, and the level of artistry that is set up by the builder himself will be a factor.

APPROXIMATE COSTS PER CUBIC FOOT FOR FRAME DWELLINGS

	Southern	Northern
First recommended level—2, 3 or 4 rooms with masonry base, fire-resistive flue, both sides of studs covered, painted exterior, interior finish.	*10-15¢	*12-18¢
Second level—Bathroom space, better finish	12-18	15-21
Medium level—5-6 rooms, with plumbing	16-23	20-26
Fourth level—Adequate standard plumbing and hardwood floors	19-27	23-30
Fifth level—Comparable to better type of middle-class city home	25-35	28-35

* The cheapest type of shelter (shack) may be built for perhaps half this cost.

Pre-fabricated Houses.—The field of house construction has been occupied almost exclusively by the individual architect or builder who has wrought according to the general ideas of the intending occupant or the real estate developer. When the plans are completed and approved, the [Pg 48] contractor assembles the necessary materials from local sources, builds and equips the house and turns it over to the buyer in completed condition. Under such a procedure there is little application of mass production measures which have reduced costs and raised quality standards in many industries, notably in automobile construction, for example.

Thousands of houses built to sell in the recent construction era of the 1920's have proved unsatisfactory and costly to the occupants as the result of shoddy building methods. Such methods seem to be typically American as distinguished from the far more solid and permanent Old World procedure. It now seems likely that the problem of economical and substantial housing will be met in the method that is also American—namely, by the pre-fabricated house to which various natural resources of the country contribute. The parts of such houses are made under mass production methods and easily assembled on the owner's lot. The same idea can be applied with ease to apartment house construction in any location. The first step in this direction has already been mentioned in the case of mail-order companies which cut the lumber to fit and supply every needed accessory to the last detail.

The next step, and the one that bids fair to inaugurate an entirely new house-building procedure, [Pg 49] is now in the making, although as yet it is in the experimental and testing stage. Examples of such construction made their first public appearance at the Century of Progress Exposition at Chicago in 1933.

Materials that enter into the construction of these new-type houses include steel, asbestos, aluminum and cement. As a rule, the buildings have a steel frame erected on cement foundations and without a cellar; the walls and partitions are of asbestos composition and the roof constructed of steel sheets with aluminum insulation. Such a building is fireproof and proof also against vermin, lightning, wind and earthquake. The house is also adapted to and equipped with heating, lighting, plumbing and air conditioning facilities. The whole building is pre-planned and pre-fabricated as a unit with its component parts constructed under economical and interchangeable mass production methods.

Modifications of the construction above mentioned include the use of sound-proofed steel panels or insulation board for partitions and walls with an exterior of painted steel. Many other modifications are being developed to insure individuality, stability, insulation and economy in first cost and maintenance. The lines of most of these houses are severe and modernistic in design, [Pg 50] although decorative and unique effects are easily obtainable.

The costs of the complete house unit range from $600 for a one-room type to $3,500 to $6,000 for a complete home of modest size. The principal fabricators of these houses and their addresses are: General Houses, Inc., Chicago, Illinois; American Houses, Inc., New York City; American Rolling Mill Company, Cleveland, Ohio; American Radiator and Standard Sanitary Company, New York City; Columbian Steel Tank Company, Kansas City, Missouri, and National Steel Homes, Inc., Los Angeles, California. Information on types and costs can be obtained by addressing these companies.

Rural Home Life.—To have a successful experience in country life, one must become identified with one's surroundings and become a part of the community. Those who seek to establish a country residence simply as a place from which to commute to city attractions will not only miss the greatest asset in country living but will probably find this existence unsatisfactory. To become interested in the growing plants and animals at home, to do with one's own hands the things that make the home more attractive and to develop a contact with the community that helps to increase its normal activities mean the attainment of pleasure and satisfaction so far beyond that [Pg 51] obtainable in congested urban quarters that there is no comparison. In many cases this direct affinity with one's surroundings will come gradually and not always easily. It can be cultivated and should be a part of the plan of every family expecting to reside in the country.

Trees as Assets.—One of the greatest assets that can be secured in the country is well-developed shade. If the house under consideration is already built and has around it trees that serve as a softening and beautifying factor, as well as for shade purposes, the value is decidedly enhanced. If the home is to be newly built and a site is available where trees are already well grown, the house can often be placed in the midst of such trees, thereby gaining a number of years in the benefits that trees give and for which there is no substitute.

Few persons can resist the charm of trees. That they also have a definite economic value is shown by the added desirability we all attach to an attractively landscaped home where trees of various kinds and sizes furnish the motif. In acquiring a place in the country the newcomer will at once wish to plant trees, shrubs and ornamentals to beautify his holdings. If this is carefully planned at the beginning, succeeding years and a little care will add to the attractiveness and intrinsic value [Pg 52] of the home. The saying, “a house is not a home until it is planted,” has a great deal of truth behind it. Most nurserymen will be glad to render assistance in properly planning and setting the ornamental landscaping of the home, helping the owner avoid mistakes and costly movings and replacements later.

Commercial Horticulture.—In addition to the plantings around his home, the owner of a few acres can at slight expense start small trees for later ornamental use or for sale at a roadside stand, for example. Such small trees and ornamental plants can often be purchased at wholesale prices from nursery companies which have “laying out” stock, as it is called, for sale. The standard large-growing evergreens and deciduous shade trees can be thus transplanted to one’s own acres, as can the popular dwarf types of evergreens and flowering shrubs. These may be planted in one area where they can be cared for as a growing crop, or they may be planted in groups for beautifying the premises while they are growing. Again, single plants may be set by themselves and given special attention, later becoming “specimens” which are much in demand by admirers of the species.

An appreciation of tree habits can be thus developed by all the members of the family, and [Pg 53] considerable income may be obtained in later years, as the trees become “of age,” through their sale. We are entering upon an era of making homes attractive as places in which to live and not as houses to go away from. All forms of plant life that contribute to this end will be admired and sought after in the years to come.

Do’s

Give special consideration to location, type of construction and interior arrangement.

If building a home, select a type that fits surroundings.

Strive for simplicity of lines and full utilization of every cubic foot of space.

Remember pre-fabricated houses are practical and likely to supplant some other types of construction.

In buying a pre-fabricated house, be sure plans and construction fit needs of family and materials used are adapted to the climatic conditions.

Give special attention to convenience and cheerfulness of kitchen.

Develop a plan of planting ornamental plants and trees to be carried out in due course.

Don’ts

Don’t try to build a city house in the country.

Don’t neglect windows in number or size.

Don’t overlook costs of completed job before commencing building or improvements.

Don’t neglect the asset value of trees.

Chapter V [Pg 54]

SERVICING THE HOME

MANY TYPES of services are available to the country home owner, including rural mail delivery, the telephone and electricity. Rural mail delivery in particular is so common that,

on practically every highway, mail service is secured by the placing of a mail box along the highway at the entrance to the residence. Telephone service is available along practically all the main-traveled highways and on a majority of the other types of roads. Where the lines are not already installed, extensions may be obtained to new locations, and this is facilitated when more than one residence is to be served by the same line. The majority of families accustomed to city conveniences will want to have electricity available so as to use electric lights and the labor-saving devices that are operated by electric power. With the expansion that has taken place in the development of rural electric lines in recent years, there is not a great deal of difficulty in getting a location which will give the housewife the advantages that electricity offers. [Pg 55]

Telephone service and electrical facilities may fall into the class of luxuries for those with limited resources. It may be pointed out in this connection that millions of farm homes are still using petroleum products for lighting purposes and are finding it no hardship. Practically all would, of course, use electricity if it were available and financially possible. The new home owner in the country will find it advantageous to locate where electric service is obtainable.

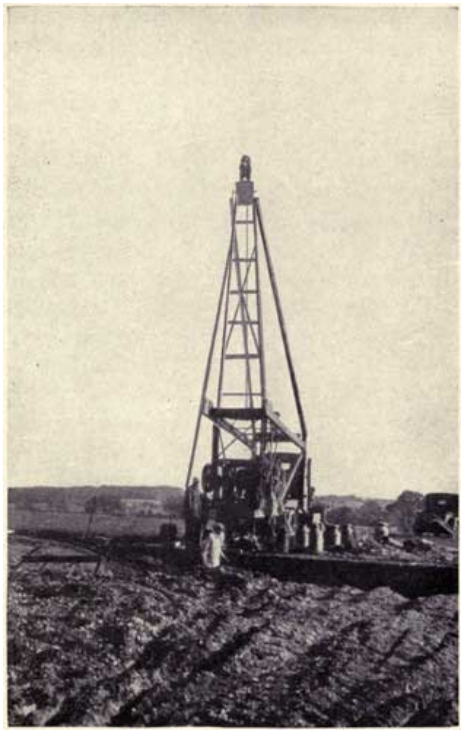
Other services for the country residents are pretty largely up to the owner as to their utilization and type. It is necessary, of course, to have an ample water supply, to maintain sanitary conditions through sewerage of some description, to provide a method of heating the home during cold weather and to provide storage facilities for food during the dormant season.

The Water Supply.—Perhaps the most important attribute of the country home is an adequate supply of water. This is particularly true where families have been accustomed to utilizing municipal water supplies which are safe and pure as to quality and unlimited in amount. In most country homes it is necessary to construct a water-supply system, which means reaching a supply of underground water, pumping it to the surface and piping it to locations where it is wanted. [Pg 56] Higher standards of living create new and increased demands for water.

Water for domestic use should be clear, colorless, odorless, soft, neither strongly acid nor alkaline, with a temperature averaging 50 degrees Fahrenheit. Such water supplies can be obtained in nearly every section of the country. Hot water is necessary in every home and there must be a heater of some type, using coal, petroleum products, natural or artificial gas or electricity for fuel. For this purpose a hot-water storage boiler or tank must be installed.

The Dug Well.—A dug well is one of the older types of wells. It should be large enough in diameter to permit ingress and egress to all parts of it for repairs or for cleaning. Most dug wells require cleaning occasionally, due to the entrance of dirt at the top and to the washing in of clay and silt with the ground water. Many of these wells contain harmful gases which have proved fatal to those entering them. Before an attempt is made to clean such a well or to make any repairs, a lighted candle should be lowered into it. If the candle is extinguished, it will be dangerous to enter until the well has been thoroughly ventilated.

A dug well will vary in depth from 20 to 60 feet, depending upon the distance it is necessary to [Pg 57] dig for an adequate supply of water. Types of pumping apparatus are on the market to cope with any depth in digging such a well. If dug wells are shallow, the water supply depends very largely upon current rainfall and in times of prolonged drouth there may be a serious shortage. Fairly deep wells of this type are usually very satisfactory and will supply surprisingly large amounts of water when the demand is made upon them.



Larger Image

Well drilling—an early step in locating in the country.
In the foreground may be seen part of the excavation for the house.

Artesian Water Supply.—Artesian wells have distinct advantages over dug wells although they are more expensive to construct. The water from such wells is absolutely pure and it never fails. This is because subterranean streams have been tapped which are not subject to possible surface contamination, nor are they dependent upon showers for replenishment.

Special power apparatus is necessary for constructing an artesian or drilled well. The drilling costs from $3 per foot up, depending upon the nature of the subsoil and whether rock is encountered. Unless such a well has been drilled in the immediate vicinity it is not possible to hazard even a guess as to when water will be struck. The consolation that such an undertaking has for the owner is in knowing there will be no doubt as to quantity or purity when the strike occurs.

Water Pumps.—Pumps are now available which operate automatically by electricity and [Pg 58] constantly supply the home with fresh water drawn from the earth as needed. The requirements for the pump and the motor will vary with the depth of the well and the water requirements of the family. In all such cases, therefore, it is desirable to call in for consultation engineers or competent representatives of pump manufacturers or distributors. It should be borne in mind that adequacy of supply is most important and that economy in first cost, achieved at the sacrifice of an adequate supply, may be a definite handicap to necessary home services.

Heating Facilities.—The type of heating apparatus that is used will depend upon the size of the house and its arrangement as well as upon the funds available. The simplest type of heaters are those which do not have a complete system of extending radiation through the home but depend upon circulation of the air within the house to equalize the temperature. In deciding upon the type of apparatus, it is necessary to make sure that the system is as low in original cost as possible; that it will probably have a long life, thereby spreading the first cost over a period of years; that it be economical in operation through efficient consumption of fuel, and that the system be easily controlled. The health of the family and the ability to live in a satisfactory [Pg 59] manner will depend to a considerable extent upon the method of heating the home, especially in cold climates.

Particular care should be taken to make sure that whatever type of heating is employed is adequate in size. It is more economical to operate a heater that is somewhat oversized than to "rush" one which cannot easily maintain a comfortable temperature in cold weather. Heating engineers and contractors are available to furnish information on heating costs in every locality. The generally used types of heating include stoves, circulator heaters, warm air, hot water and steam systems, and fireplaces. Specialists of the United States Department of Agriculture have developed a great deal of information to enable the home owner to cope with the heating problems in a practical manner. It is estimated by the department that if a two-pipe hot-water system for a six-room house costs $500, the other systems for the same house ordinarily would cost about as follows:

Two-pipe vapor system	$600
One-pipe steam system	$400
A piped warm air furnace	$260
Pipeless furnace	$140
Circulator heater or stove	$ 60

Of course, these systems vary in efficiency and in providing comfort as much as they vary in cost, [Pg 60] but these estimates will provide the home owner with an idea of the outlay for taking care of the heating problem.

The ability to maintain a satisfactory temperature depends as much upon the construction of the house as upon the heating apparatus itself. Heat is readily lost through walls, roofs and windows. Most houses can be made more comfortable at small cost by applying insulation or by correcting defects in construction. The use of storm doors or storm vestibules where doors are frequently opened to the out-of-doors will prevent drafts and conserve heat. Metal weather stripping is the most effective means of preventing air leaks around windows and doors and making the entire house weather-tight.

The fuel that is used will depend upon the type of furnace and the relative prices prevailing for different kinds. Recent developments in oil heating bring this fuel in close competition from the standpoint of economy with coal or coke. Oil is particularly adaptable as a source of fuel in homes in the country since tank trucks can readily deliver oil to the home owner. Improvements in securing the maximum efficiency from all types of fuel are being developed continually; and there are now on the market furnaces, using anthracite or bituminous coal as fuel, which offer many advantages that were unknown to older types.

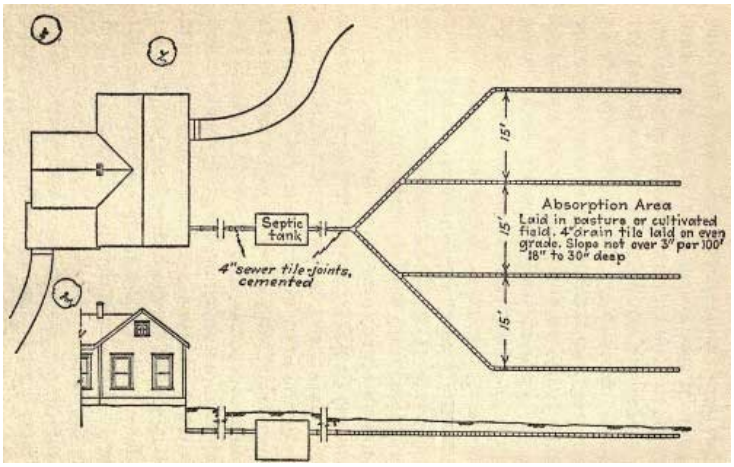
Fireplace Construction.—An open fireplace where wood can be used as fuel is a great source of [Pg 61] satisfaction and pleasure, as well as a comfort, in country homes. Wood of proper length for fireplace burning can be readily secured in the country and there is ample room for storing it. Where the house is small in size, such wood fires can be used for heating the house satisfactorily in spring and fall and can be used to supplement other types of heating when desired.

No country home can be considered complete without a fireplace. The comfort and homelike atmosphere that it gives make it a general asset for the enjoyment of the family circle. Fireplaces should be constructed so as to insure a good draft with a maximum of heat radiation. It is desirable to build in the fireplace flue a damper which can be open when the fire is burning and can be shut when it is desired to keep heat from escaping from the room via the chimney. It is

also a convenience to have a trap opening placed in the back of the fireplace on the floor so that ashes may be removed in this manner, eliminating the labor of carrying them from the fireplace.

Sewerage of Farm Homes.—All wastes from the farm home coming under the term of sewage should go direct to a septic tank. Here the sewage is held in a quiet state for a period of time, and through bacterial processes, the organic matter is destroyed. A septic-tank installation consists of four parts: first, the house sewer from house to tank; second, the sewage tank, consisting of one or more chambers; third, the sewer from tank to distribution field; fourth, the distribution field where the sewage is distributed, sometimes called the absorption field. Plans for sewerage construction may be obtained from state and local boards of health and from federal health and agricultural agencies.

[Pg 62]



Larger Image

(*Courtesy New Jersey Agricultural Extension Service*)
An adequate sewage disposal plant is essential and inexpensive. A practical one is shown here.

The Rural Engineering Department of the New Jersey Agricultural Experiment Station [Pg 63] recommends that the septic tank have a capacity adequate to hold all the water used by the family for two entire days. For a family of six persons the inside dimensions of the tank should be 4 feet in width with a length of 4 feet in the first chamber and 3 feet in the second chamber. The depth of water should be 4 feet, giving the tank a capacity of over 600 gallons, thus allowing 100 gallons for each person during the forty-eight-hour period. The entire tank will be 4 feet wide, 8½ feet long and 6½ feet deep.

Septic tanks are usually built of solid concrete, concrete blocks or brick, waterproofed on the inside to prevent escape of the contents except through the outlets described. These outlets should be 100 to 150 feet away from any source of water supply to prevent contamination of [Pg 64] potable water.

Leading from the outlet of the second chamber, several lines of tile 10 to 14 inches in depth should be laid at a gentle slope away from the tank, permitting escape of the effluent at each joint. For a family of six persons a total length of 150 feet of tile pipe will be sufficient in most types of soil.

Food Storage.—Every country home should have a basement in which a room can be set apart for cold storage. Such a place is suitable for keeping supplies of potatoes and other root crops, as well as commodities that deteriorate under conditions of warmth. Surplus supplies of food from the garden can be placed in such storages and be readily available for use during the winter. With the surplus of perishable food products in cans and with a good supply of non-perishable products in such a type of storage room, economies in food purchase can be effected and the healthfulness of the family maintained through their use when fresh products are difficult to secure or are unseasonable and expensive.

If a basement is not available for food storage, root crops can be stored outside the house and kept during the winter. These products should be piled in a heap, covered with straw or other [Pg 65] clean, loose material and the mound then covered with earth. In this manner, potatoes and similar crops can be kept throughout the winter and until late in the spring without serious deterioration. It is important to select a site for such outdoor storage that is well drained so that water will not collect and freeze in the storage area.

Services Available to the Country Resident.—Public agencies are available for help in solving the problems of country residents, varying from agricultural and horticultural practices to building construction, water supply and sewage disposal. As a rule, these services are of advice and suggestion, are free of cost and may be utilized freely by those living in the country.

Most of the counties in the United States have a county agricultural agent, who is located at the county seat and whose territory covers only the county in which he resides. The costs of such service are paid by federal and state appropriations, frequently supplemented by county appropriations, and also frequently through annual individual subscriptions. The county agricultural agent is really a field representative of the United States Department of Agriculture and of the state agricultural college in the state where he works. There is hardly a problem of the country resident for which he cannot obtain aid from the county agricultural agent. In many of the [Pg 66]

more thickly populated areas the problems of the family getting a location on the land for a home are already well known to the agricultural agent and he is therefore in a position to guide the newcomer and help him to prevent mistakes.

In many counties there is also a home economics service connected with the office of the county agricultural agent and supported in the same general manner. This service, along the lines which the name implies, is available to the country home maker. Groups of women are organized and meet at intervals for discussions on food preparation, canning and storage and the making of clothing for the family.

In nearly every state there is a state department of agriculture with regulatory and promotional activities and dealing especially with law enforcement provisions passed by the respective legislatures. These agencies are also concerned with development of marketing facilities in many states. They are supported by state and federal funds and carry on such projects as the testing of cattle for tuberculosis, treatment in prevention of communicable animal diseases and the control of insect and fungous pests through quarantine and inspection activities. These departments are located at the state capitols and information on the services available can be secured by addressing the department in the state where one resides. [Pg 67]

Because there is a lack of understanding among newcomers to the country of the services that are available through these agencies without cost, this particular mention of them is made. It is recommended that each family get in touch with the county agricultural agent, the college of agriculture and the department of agriculture and learn definitely of the help that can be secured without cost in meeting the problems of country life.

Electric Wiring Principles.—Public utilities are organized to furnish electric service and it will be found that they are ready to assist customers in securing the most satisfactory use of electricity. Such knowledge, based on experience, will be valuable in helping owners to avoid costly mistakes and to provide for a wiring system that will be economical and yet complete. When the plans and specifications of the wiring system have been worked out, it is important to secure bids from reliable contractors. Only those contractors who can do the work in a capable manner should be employed and it should be determined in advance that the installation will be in strict compliance with the National Electrical Code. For wiring work it is necessary to know the number of amperes the wire is to carry. This may be determined by dividing the load in watts by the voltage which is to be used. [Pg 68]

The service lateral is a system of wires which form a path over which electricity is carried from the main line to the house. This is generally built by the utility company and its cost will depend upon the distance of the residence from the main line and whether the owner furnishes poles, labor, etc.

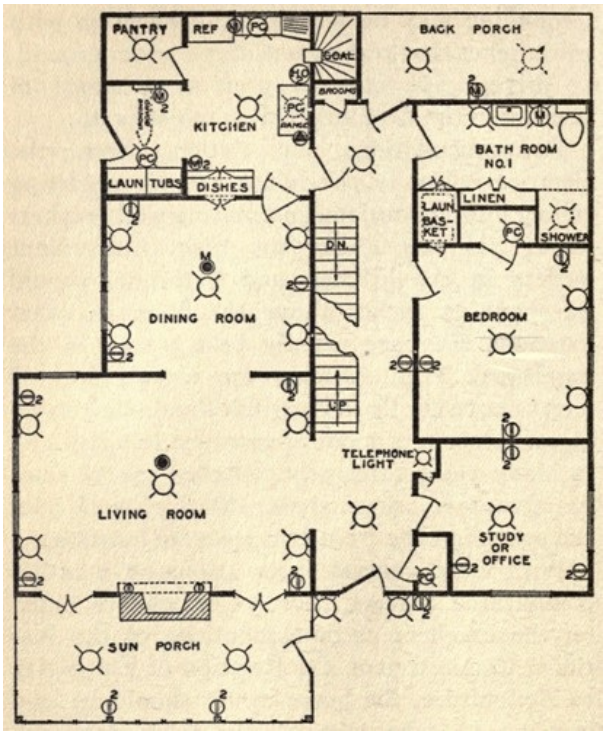
Wires should be of such size as to give sufficient mechanical strength to stand up under sleet conditions. Usually three entrance wires are used to carry the electric energy from the utility connection to the house. The lateral is the electrical doorway to the farm and is the most essential part of the wiring system. The wires should be of adequate size so as to provide proper voltage and give complete electrical service for all ordinary requirements of current.

It is important to see that the electrical equipment is properly “grounded,” that is, the connecting to earth of certain metallic objects which are near power conductors. The purpose is to carry to the earth any heavy electrical charge which might exist on such objects and cause electrical shocks when they are touched. Grounding may be secured by connecting with water pipes that reach some depth under ground, or driven pipe may be used as a means of securing intimate contact with moist earth. [Pg 69]

Recommendations for outlets from the electrical wires in the house call for centering ceiling lighting outlets, and placing wall brackets about 5½ feet above the floor. Convenient outlets in the kitchen and bathroom should be about 33 inches above the floor. In other locations they are usually best placed in the baseboard. Wall switches are usually located 4 feet above the floor. A switch should be located at each door to a room or entrance to a hall and in many cases three-way switches can be used to advantage, since these afford control over the same lighting from two separate locations.

With these general observations on a rather complicated subject, most of which are based on the excellent recommendations of the National Committee on the Relation of Electricity to Agriculture, the home owner should be in a position to take care of his needs properly, bearing in mind that the system of wiring should be adequate in every respect and the number of outlets sufficiently numerous to provide easy and convenient service throughout the house. An official check-up should be made of all installations after completion. The method of securing such inspection can be obtained through a local electrical contractor.

[Pg 70]



Larger Image

(*Courtesy New Jersey Agricultural Extension Service*)
Ground floor plan of a house, showing the number, the type, and the location of electrical current outlets.

Tank Gas Supply.—A service of supplying compressed gas in portable tanks has recently been developed for country homes located away from public gas lines. This gas can be used either with a specially adapted range which is supplied as part of the service or in some cases with an ordinary gas range. Companies offering this service are located in most cities and are understood to be willing to supply residences anywhere with gas. The cost of first installation of the system is about $40. Renewals cost approximately $12 per cylinder of gas. Each cylinder will supply a family of four with gas for three to four months, making a monthly bill of from $3 to $4, which compares favorably with artificial gas supply through a meter from pipe lines. This gas may be used for any purpose for which any other gas is adapted. The gas and the servicing of it constitute a boon to country residents from the standpoint of utility and economy. It is especially desirable for those previously accustomed to city gas supplies and to whom the use of any other type of fuel is strange and somewhat of a problem. [Pg 71]

Do's [Pg 72]

Remember that important service factors include mail delivery, telephone, electricity, water supply and sewage disposal.

Be sure of adequate water supply of good quality.

Obtain artesian water supply wherever possible.

Provide for such heating facilities as the budget can stand.

Select the heating system in relation to fuel costs.

Make sure that the sewerage system is adequate for waste disposal.

Use fully such governmental agencies as county agents, home demonstration agents, experiment stations and agricultural colleges, state and federal departments of agriculture.

Provide storage space for surplus food products.

Remember electric wiring requires skilled workmanship.

Investigate advantages and costs of tank gas as a cooking fuel.

Don'ts

Don't forget that services automatically available to urban residents must be planned for in the country.

Don’t neglect construction defects that prevent full benefits from heating system.

Don’t overlook the advantages of a well-built fireplace.

Don’t install electrical service without full attention to principles of convenience, safety and economy involved.

Chapter VI

[Pg 73]

MAKING THE SOIL PRODUCE CROPS

THERE are many treatises available that deal with the soil, its composition and its treatment. No attempt will be made here to go exhaustively into that subject. There are a few fundamental factors, however, which the potential owner should know regarding soil treatment, for that is the base upon which he will build his income-producing operations.

The particles of soil have had their genesis in rock. The rock has become disintegrated and decomposed through natural processes. The action of the weather is the most important factor in creating soil. Water falling on rock not only wears it away mechanically, but through certain mild acid elements which it acquires, disintegrates the binding materials that hold rock segments together. In addition, there is the action of frost and freezing, too, making the moisture in rock expand and contract and thereby causing the breaking down of the segments. With this action is coupled that of hot suns which cause expansion and breaking up of the rock as it becomes heated and cooled under atmospheric influence.

[Pg 74]

A great deal of the soil surface in many sections of the country is the result of glacial action. These glaciers not only eroded the surface, thereby creating millions of rock particles, but they also carried large deposits of the rock particles to more distant areas and deposited them over a subsoil that may be totally different in character from the surface soil thus deposited.

How Tillable Soil Is Made.—The action of plants themselves has a great effect in adding to our supply of tillable soil. Seeds of plants or seeds of trees become established in some slightly weathered rock areas and begin to grow. The roots penetrate wherever there is any loose soil, and partly by their pressure and partly through the acidity accompanying decomposing plant tissue, complete a further breaking down of the rock. There is a continuous process of destruction of rocks and leveling off of mountains and hills to fill the valleys below.

Many groups of deep-rooted plants tend to increase the depth of the surface soil by growth of the roots in the subsoil and by creating therein a condition approaching that which already exists on the surface. The action of earth worms and similar forms of life in bringing subsoil to the top and in opening channels through which water and surface air can penetrate constitutes another continually operating force in the creation of a productive soil. A deeper layer of productive soil can also be created through a plan of consistently deeper plowing, bringing up with each annual plowing operation a small portion of subsoil which, when mixed with the surface soil, tends to become like it.

[Pg 75]

Larger Image

(*Courtesy New Jersey Department of Conservation and Development*)
Soil is created from rock by nature’s weathering processes and by plant growth.
At the bottom may be seen solid rock; just above are disintegrating rock fragments, and at the top, the soil.

Every type of real soil contains all the elements of plant growth. This plant food results from a breaking down of soil particles and the setting free of chemical elements which, either singly or in

combination, serve as food for plants.

Whatever the type of soil may be, it will be found that certain crops will make better growth in it than others. As a general rule, it may be said that the only way to determine which plants will grow best on a given soil is by the trial-and-error method. However, by observation of the growth on similar types of soil we can learn something of a soil's crop adaptability. There are some crops that will grow in almost any soil and there are others that need an exactness of texture, moisture and plant food which makes them highly specialized products. The operator must learn how to work in harmony with the peculiarities of his own soil before he can hope to get the best results.

In acquiring a tract for the growing of plants of any kind it is desirable to get a soil type that will [Pg 76] meet the requirements of most plants. As a general rule, this type contains enough clay to be retentive of moisture, enough sand to be easily worked and is generally suitable for bacterial growth. In other words, what is commonly called a loam is the ideal type for general agricultural and horticultural purposes. This may be a heavy loam, in which clay predominates, or a so-called light loam, in which sand particles predominate. An examination of a handful of soil by a person experienced in farming will indicate its nature and its adaptability to ordinary crop production.

Essential Elements of Plant Food.—Countless scientific experiments in plant growth show that potassium, lime, phosphorus, magnesium, iron, sulphur, nitrogen, carbon, oxygen and hydrogen are essential to normal development. The carbon, hydrogen and oxygen elements make up nearly 99 per cent of the entire composition of the plant and are derived from the atmosphere. All of the other elements are derived from the soil except in the case of peas, beans, clovers and other legumes which secure most of their nitrogen from the air.

The mineral elements are not needed in large amounts but well-balanced plant growth is strictly [Pg 77] dependent upon their presence in available form. Of these elements, those most likely to be deficient either in total amount or in availability are nitrogen, phosphorus, potassium and calcium. It is entirely feasible and economical to apply concentrated chemical fertilizers containing the first three elements so that their lack will not constitute a limit to size of crops harvested. In many cases it is necessary to apply chemical fertilizers to get satisfactory yields, even where natural manures are available and can be applied as well.

In addition to supplying essential plant food, nitrogen, phosphorus and potassium perform specific functions in plant growth. The application of nitrogen in one of its readily available forms (e.g., nitrate of soda and sulphate of ammonia) will stimulate vegetative growth. If too much of this one element is applied, leaf and branch development may occur at the expense of the crop. Good results follow the use of nitrogen on grass sods and on leafy vegetables like spinach. On the other hand, corn, peas, beans and other seed-forming crops need to have the nitrogen balanced with phosphorus. Potatoes, in common with other tuber and root crops, will utilize plenty of potassium in the development of starch.

Sources of Plant Food.—Chemical fertilizers can be purchased at supply stores in ready mixed [Pg 78] condition and of analyses that will meet general crop needs. A good formula for such a general purpose fertilizer is 4 to 5 per cent nitrogen, 7 to 9 per cent phosphoric acid and 7 to 10 per cent potash to the ton. It is known that such a mixture will supply the food needs of a large variety of plants in balanced amounts. Highly concentrated mixtures are now on the market providing double the amount of plant food in the example quoted, costing nearly twice as much but effecting a saving by cutting in half the material handled to get the same result. Care should be taken, in using these highly concentrated fertilizers, to avoid contact with tender roots. A mixture for general farm and garden purposes may contain the following ingredients:

100	pounds nitrate of soda
230	pounds sulphate of ammonia
250	pounds animal tankage (7 per cent nitrogen)
1,140	pounds superphosphate (16 per cent phosphoric acid)
280	pounds muriate of potash (50 per cent potash)
2,000	pounds.

This mixture will have a formula of 4-9-7 (4 per cent nitrogen, 9 per cent phosphoric acid and 7 per cent potassium). The individual who wishes to mix his own fertilizer may do so by purchasing the finely ground ingredients separately, and by means of a shovel, integrate them all into a [Pg 79] mixture. Home mixing will not be found profitable where small amounts of fertilizer are used. Those who practice home mixing for the first time should realize that most combinations of ingredients will "set" or harden if not used immediately, necessitating the breaking up and pulverizing of the mass. When it is broken up after curing, no further difficulty should be experienced with "setting" if the mixture is kept in a dry place. The advantages of home mixing for the large user lie in lower cost per ton of plant food as a rule; confidence in the quality of the ingredients which he should purchase on the basis of guaranteed analysis; and the setting up of a mixture which study of his soil and the plant requirements has convinced him is best suited for his individual case.

Chemical Soil Analysis Not Helpful.—There is a mistaken notion that it is necessary to analyze soils chemically in order to fertilize them intelligently. Such an analysis of a reasonably fertile soil will show the presence of the essential elements of plant food, though perhaps not all in sufficient amounts, to produce ordinary crops for centuries to come. Only a small amount of the elements become available for root absorption each year and a chemical analysis will not bring out this most important factor—availability. The use of a few simple tests, mainly of a physical nature by a [Pg 80] competent soils specialist, will prove of some assistance in the treatment of the soil. Such tests will show the presence of adequate amounts of humus, and indicate the acidity content. The soil

texture will give some index of its crop adaptability and thereby serve as a basis for fertilizing treatment that will meet the needs of both soil and crop. The practical man will not expect any considerable aid from a highly technical and costly chemical analysis of his soil.

Another factor that militates against worth-while benefits of chemical soil analysis is the great variation in soil types frequently occurring in the same field. To attempt to draw a representative sample by mixing soil from several areas might result in a specimen that would not be really typical of any area. For the purpose of ordinary physical examination and testing for acidity, representative soil samples should be taken from several parts of the same soil type, mixed together and a composite sample for testing drawn from the mixture, weighing not less than a pound in each case. If the soil is quite apparently variable it may be necessary to draw two or more composite samples from the same area. Very helpful service in intelligent soil treatment may be secured from the county agricultural agent and the state college of agriculture in the county or state of residence. [Pg 81]

Legumes as Soil Improvers.—A means of soil improvement that is well understood by progressive farmers is the use of legumes to improve the soil. The legumes include a large family of plants of which the bean, the pea and the clovers are outstanding examples. Such plants have on their roots nodules which house nitrogen-gathering bacteria. These bacteria absorb nitrogen from the air in the soil and, in the ordinary process of growth, death and decay, make this nitrogen available to the host plants, leaving a residue in the soil for the roots of plants that are to follow. Thus this group of plants, known as legumes, have been used for generations as a method of increasing the nitrogen content of soils. Nitrogen, incidentally, is the most costly element to buy in commercial fertilizers. The soil-improving benefits of legumes may be secured by growing them either for harvest as a source of animal food or for plowing under as a means of utilizing them entirely for the development of soil fertility.

In reading of the studies of soil fertility that were made by George Washington at Mount Vernon, we learn of the improvement that he made in the relatively poor soils of that area by growing plants of the legume family. The actual reason why such improvement was brought about was not known in Washington’s time, but the results were apparent. Today, the value of legumes as soil builders is well recognized and we understand much more definitely than Washington did the reasons for their being so helpful in increasing crop production. [Pg 82]

Many soil areas do not contain the particular type of bacteria necessary to the fixation of atmospheric nitrogen by legumes. This is frequently the cause of failure in growing alfalfa, soybeans, cowpeas and less well known members of the legume family. Each legume has its own type of nodule-forming bacteria. In order to assure the presence of the proper bacterial family, means often must be employed to add them to the soil where the specific crop is to be grown. This may be accomplished by adding soil from an area where the legume does well to the new area, or the seed may be inoculated with commercial cultures before seeding. Either method is effective. If soil is used it should be drilled in or spread on a cloudy day to prevent the destructive action of the sun’s rays on the exposed minute forms of plant life we call bacteria.

If it is not known that the legume to be planted has been grown successfully in a given field within the previous several years, the precaution of adding the proper bacteria should be taken. In some sections, such legumes as red, alsike, crimson and white clovers have been grown for many years and the bacteria for these plants are well distributed. There, inoculation is not necessary for these crops, but it probably should be practiced if other legumes such as alfalfa, cowpeas or soybeans are to be grown on land for the first time. [Pg 83]

The Value of Humus.—In addition to the chemical elements of plant food, all productive soils contain decaying vegetable matter, generally classified under the term “humus.” Humus serves as a source of acid-generating material which further breaks down soil particles and, most important of all, serves as a food for millions of microscopic plants which develop and die quite beyond the scope of human vision. These constitute a type of bacteria which are distinctly beneficial and essential to human life since they make possible the growth of larger plants that serve as human food.

Green plants, straw or leaves, when plowed under or spaded in the soil, are attacked by bacterial agencies which gradually turn these products into humus. The same process occurs when a “compost” is set up. This is made of leaves, manure, soil, straw and other materials thrown into a heap and allowed to decay. Such compost is excellent for placing around plants when setting them out, since it holds moisture, supplies fertility and creates optimum conditions for young root growth. Under practical field conditions, humus may be added to soils by spreading animal manures, followed by plowing them down, or by the growing of heavy green crops such as wheat, rye, cowpeas or vetch and turning the entire mass under with the plow when they are at their height. [Pg 84]

Lime and Its Application.—Reference has been made to the fact that calcium is an essential plant food and is frequently deficient in soils. As a matter of fact, the great majority of soils are deficient in calcium and their productiveness is inhibited thereby. Lime supplies calcium and also magnesium as food for plants. Its application accomplishes many other desirable things such as correcting soil acidity. The growth of beneficial bacteria is greatly stimulated in a soil that has had its acidity neutralized by the application of lime. This product, therefore, creates a more congenial condition for the growth of bacteria, which, in turn, make for better crop production. Lime is also beneficial through furnishing the element calcium with which other plant foods combine chemically and thereby become soluble in the soil water. Unless plant foods are in a state of solution, they cannot be absorbed by plant roots. Lime is a potent force in creating chemical reactions in the soil, resulting in the stimulation of growth through increased absorption of essential elements in solution. [Pg 85]

Lime also benefits soils of a clayey nature through its ability to cement together the fine clay particles and in that way create air spaces so greatly needed in tight clay soils. Lime is beneficial, too, in the case of soils which have a large proportion of sand or large particles, and serves as an agent in creating a better condition of tilth and of moisture retention.

It makes little difference in what form lime is applied. It may be purchased and applied in the form of ground limestone, a rock rich in calcium which has been mechanically ground to a very great degree of fineness. It can also be applied in the form of hydrated lime. This is obtained by heating ground limestone and slaking it by adding water. A common example of this is the slaking of lime for whitewashing purposes. Another good source of lime is finely ground shells of oysters or other forms of sea life which collect the calcium from sea water and deposit it in their shells.

Adjusting the Water Content of Soils.—Aside from the supplying of water by irrigation, a rather costly process under most conditions, the water resources of most soils can be greatly increased [Pg 86] by adding to their humus content. Humus, which, it has been pointed out, is decaying vegetable matter, serves as a sponge for the absorption of soil water and for underground water supplies. Therefore, the more humus that can be plowed into the soil, other conditions being equal, the greater is the ability of the plants growing in that soil to withstand drouth. As soils are cultivated, the tendency is for the humus to become "burned out" and to have a reduced moisture-holding capacity. To overcome this tendency, it is necessary to add vegetable matter to the soil whenever it is possible. Incidentally, the incorporation of large quantities of humus in the soil creates a condition of acidity which may call for the application of lime as a corrective.

There are many acres of land which contain too much water in the area that roots should penetrate to permit of optimum plant growth. Roots of most plants will not penetrate where there is an excess of water, and air cannot circulate where moisture is superabundant. Usually these conditions exist where the soil is of a clayey nature. The abundance of water may be caused by the inability of surface water to percolate through the soil. It may take so long, due to the nature of the soil, for this water to pass through the lower depths of subsoil that the roots of plants are [Pg 87] destroyed by lack of oxygen. In such cases the application of lime, increasing the humus content, and deeper plowing will be found helpful. Occasionally, the discharge of dynamite or blasting powder in the area, if it appears to be in the form of a pocket, will break up the hard pan subsoil and permit the water to escape. Less dependence is now being placed on this means of correcting a wet condition of the soil than was the case some years ago.

A similar condition of overabundant water in soil may be due to the presence of springs or to a high water table. Little can be done to correct a condition where the water table itself is so close to the surface as to inhibit plant growth and this is assuredly one of the factors to be looked into before a tract is purchased. Where the surplus water is evidently being supplied by a spring, an underdrain made of tile pipe, 3 or 4 inches in diameter, can be laid as a means of conducting the water into a ditch or adjoining drain. In laying such a drain, it should be placed above the area where the wet soil surface is most evident. If such a drain is laid 18 inches to 3 feet deep above the wet area, it will cut off the water seeping down underground and carry it away. Good results cannot be secured if the drain is laid directly in the area of extreme wetness or if it does not cut [Pg 88] off the flow of water before it reaches the area that is consistently too wet for plant growth.

From what has been said in this brief description of soil treatment and soil improvement, it is evident that one must live with his soil for some time in order to understand it and to be able intelligently to correct its deficiencies, overcome its weaknesses and make it capable of supporting plants which are desirable from the owner's point of view. In the great majority of cases, the improvement process, while a slow one, is far from hopeless and almost any soil that is not extremely sandy or clayey can be so intelligently treated as to make it productive.

Cultivation.—Any discussion of soil treatment is not complete without mention of cultivation. Intelligent cultivation is an essential factor in securing adequate crops. It is interesting to recall that the word "manure," which has come to mean fertilization or fertilizer, is derived from the Latin word "*manus*" meaning "hand" and implying "manipulation" of the soil, which we now call cultivation. Cultivation has been most frequently practiced as a method of destroying weeds, thereby making all of the available plant food subject to absorption by the roots of the desired [Pg 89] plants and not by the intruders we call weeds. Cultivation does more than destroy weeds, however. It opens up the soil so that air containing atmospheric nitrogen can penetrate it and so that the bacteria requiring air for their best growth may have it available. Furthermore, cultivation conserves moisture and is more essential during dry periods in the growing season than at any other time.

We know that in entering the soil the rain water follows certain channels in and around the soil particles on its way to the subsoil. When the rain has ceased and the top layer of soil becomes dry, the tendency is for the water to work up through these same channels to the surface, where it evaporates. Cultivation, by breaking up these channels, or capillary tubes, checks the escape of moisture into the air. It creates a blanket of dry surface soil which insulates the soil moisture from the air above. The tendency of soil moisture to reestablish capillary methods of escape makes recultivation necessary from time to time in dry weather. Care must, of course, be taken that the cultivation is not harmful to roots of growing plants. If these roots are disturbed or destroyed through cultivation, more harm than good may result because of the damage to the root systems.

Farm Power and Equipment.—Where the land area to be cultivated is larger than the family [Pg 90] garden some type of equipment for working the land, propelled by horse or motor, will be found desirable and in larger areas essential. One or more horses may be used where there are stabling facilities and where arrangements can be made for the daily care and feeding that these animals require. A horse suitable for work purposes may be obtained for less than $200. The price will, of course, depend upon the age and physical soundness of the animal, but should not exceed $150

for a physically sound animal under ten years old. A person unskilled in the assessing of animal values should obtain the services of a veterinarian or an experienced horseman in making a selection. A horse for this purpose should be of quiet, tractable disposition, bred and broken for work purposes. The cost of caring for a horse for one year will approximate $125, including feed and bedding, but without labor charge.

Leather harness costing $25 to $50 will be required and in addition tools, including a plow, a harrow, and a cultivator costing about $15 each. Other special equipment such as a mower will cost considerably more, depending upon the type used.

If the members of the family are fond of animals and willing to assume the responsibility for their daily care, the horse will be found an efficient and useful source of power for tilling the land. In this connection it should be pointed out that flies breed with great rapidity in the strawy manure of the stable, and such wastes should be spread upon the land almost daily or treated to prevent fly-breeding. [Pg 91]

Tractor Power.—Just as large tractors have supplanted horses and horse-drawn equipment on thousands of farms in the United States, the so-called garden tractor has become increasingly popular for the tilling of small acreages. The tractor requires “feed” only when it is working, is not subject to the ills that beset animals, and may be used for twenty-four hours a day if necessary. It makes an appeal to the mechanically minded members of the household and, if properly cared for, will give economical and lasting service.

The usual type of garden tractor consists of two large wheels with lugs on them to give traction and is driven by a one- or two-cylinder motor. A plow, a cultivator, or mower may be attached to the drawbar, the operator walking behind and regulating the speed and guiding the outfit by handles provided for the purpose. Earlier types of these machines were not always satisfactory owing to construction weaknesses and occasionally balky motors. Those now on the market, however, are greatly improved, require less attention, and rival their big brothers, the powerful farm tractors, in dependability. [Pg 92]

There are a number of types and makes of garden tractors now on the market, ranging in price from $175 or less to $400, the cost depending largely upon the size and capacity of the motor. In selecting a satisfactory garden tractor attention should be directed to the simplicity and power of the motor, the type of bearings, the method of lubrication of all moving parts, the working speed and the economy of fuel. Bearings ought to be of standard, long-wearing type since these are subject to hard service. Two speeds are desirable, a slow one for heavy duty and a faster one for lighter work. The tractor should operate all day on about 2 gallons of gasoline and a quart of oil. In addition to power applied at the drawbar where special tools are attached, a pulley will be found a desirable accessory for operating belt machinery such as small feed mills, pumps, and cream separators. The rating of the motor should be not less than 3 horsepower at the drawbar for the ordinary tasks it will be called upon to perform.

All types of attachments are available for the garden tractor. These include plows, disks, harrows, cultivators, mowers, fertilizer distributors, planters, sowers and seeding accessories. The prices of these vary according to make and quality. Levers are provided for adjusting the depth of plowing, cultivating and seeding. Some of the large type garden tractors are equipped with a seat on a sulky attached to the machine so that the operator can ride and have complete control over speed and the type of work he wishes to do. A modern garden tractor will be found very useful in taking care of a lawn or garden. In the case of larger areas under cultivation, but not of field size, this type of machine is rapidly gaining popularity for performing efficiently and economically the numerous jobs that are to be done on every small farm. [Pg 93]

Do’s

Select a soil type that is inherently productive, fertile, retentive of moisture and easily cultivated.

Supplement soil fertility by adding chemical fertilizers either singly or in combination.

Buy mixed fertilizers on the basis of guaranteed analyses.

Use legumes (peas, beans, etc.) to add nitrogen to soils and increase humus content.

Add specific bacteria for the production of various legumes.

Use manure and green crops to supply humus.

Apply lime when soil test shows need for it as plant food and general soil improver. [Pg 94]

Practice methods that make soils absorptive of moisture and permit escape of excess water.

Cultivate the soil to check escape of moisture and to kill weeds.

Use a horse or garden tractor for cultivation of areas larger than the family garden.

Don’ts

Don’t buy land that is continually wet and swampy.

Don’t expect to produce satisfactory crops on soils that are extremely heavy or clayey or so sandy as to quickly lose moisture and fertility.

Don’t try to produce crops without maintaining the humus supply in the soil.

Don’t neglect cultivation as a means of conserving moisture, destroying weeds and stimulating root growth.

Chapter VII

[Pg 95]

FOOD FROM THE GARDEN

THE HOME vegetable garden should supply an important part of the food for every family living in the country. Vegetables that are of the right varieties and that are fresh and properly prepared are nutritious, wholesome and economical. Not only does the well-organized home garden reduce the cost of feeding the family, but it constitutes an effective method of maintaining better health among all members of the household. Even common vegetables that are grown from the best varieties and served fresh will be a revelation to those accustomed to buying them in stores. Deterioration in quality and palatability begins immediately in vegetables when they are harvested. The more perishable the commodity, the greater is the rate of deterioration.

The commercial vegetable grower usually inclines toward varieties that are capable of producing a heavy yield per acre or that stand shipment and temporary storage with the least apparent loss from deterioration. In order to have his products reach the consumer in an attractive condition, [Pg 96] the commercial grower usually must harvest them before they are at their best. The channels through which vegetables and fruits pass on their way to the city consumer are devious, slow and costly. Such a consumer therefore usually receives so-called fresh products that have been removed from the plant or the soil before maturity is attained and after such already poor quality has deteriorated through aging processes.

All these disadvantages of vegetables purchased in the city are eliminated by the possessor of a garden where he may produce his family’s needs (and they are genuine needs) in the way of fresh vegetables. These products are essential in supplying such necessary elements as minerals, vitamins, acids, and cellulose. Dietary authorities advise that leafy vegetables, sometimes called “greens,” contain food elements not found in root vegetables. For the maintenance of health, the diet should include a variety of vegetables besides potatoes.

Assets of a Garden.—A garden is a source of recreation, pleasure and satisfaction to every member of the family. Real enjoyment can be had by working in it a little time each day. To those whose work may be sedentary and of a routine nature, the garden furnishes a source of [Pg 97] inspiration and adventure. Daily evidences of plant growth and the novelty of having vegetables of one’s own growing stimulate interest in it. The garden is an aid in maintaining health through physical exercise and the liberal consumption of the fruits of labor. There is no other avenue of activity that can afford so much in the way of health, economical recreation and pleasure as a well-planned garden.

Larger Image

(*Courtesy New Jersey Agricultural Extension Service*)

The well-planned garden furnishes food throughout the year for the entire family.

Having decided on a garden, the question immediately arises as to the procedure to be followed to get the most out of it. Special attention has been given to this problem by experts throughout the country and specific recommendations are now available on the subject at state agricultural colleges. These cover varieties, planting dates, adequate area, fertilization, rotation of crops and storage. Typical recommendations along these lines are given here for the north-central and eastern states. Readers living elsewhere may wish to check them with the practices recommended by authorities in their home states.

Vegetable Growing by Rule.—The most effective method of presenting the story of recommended vegetables, desirable varieties, seed required, average yields and other pertinent data is in tabular form, such as that used in Table I, which has been prepared for the aid of home vegetable gardeners by the New Jersey Agricultural Experiment Station, and which is based on years of study of the subject. Table II, prepared by the Michigan State College of Agriculture, shows the amount of seed that should be purchased to supply an adequate quantity and variety of important vegetables for a family of six persons. [Pg 98]

Examination of the planting table will show that the setting of plants or roots is occasionally recommended instead of the use of seed. This is desirable in some cases to get quicker results and in other cases is essential if a crop is to be secured during a normal growing season. While it is possible for the grower to raise these plants, or sets, himself, usually more satisfactory results can be obtained through buying them from a capable plant grower. The growing of sets is a specialized business requiring conditions of heat, moisture, fertility and skill, frequently beyond the patience and capacity of the amateur. There are plant growers in nearly every neighborhood who will grow the needed plants at small cost. Arrangements should be made in advance for growing the varieties or strains that are wanted, and usually the grower can furnish his own seed for the plants if that seems desirable to him. One desiring to grow one's own plants from seed can secure full information from a practical grower or from state and county agricultural agencies. [Pg 99]

TABLE I

PLANTING TABLE FOR VEGETABLES[1]

Name of vegetable	Variety	Seed for 100-row	Depth to sow seed, inches	Distance between rows for cultivation, inches		Distance between plants in row, inches	Time of planting seed outdoors	Time of harvest	Average yield 100-foot row	Average days from seed to harvest
				Horse	Hand					
Asparagus	Washington, Palmetto	1-yr.-old roots	8-10 roots	5 ft.	4 ft.	16	—	Spring-July 1	15 2-lb. bunches	2 yr.
Beans										
Green bush	Stringless Green Pod	½ pt.	1-1½	30	18	3	Apr. 15	June 20	2 bu.	40-65
	Bountiful						July 15	Sept. 15-Frost		
Yellow bush	Currie's Rust Proof,	½ pt.	1-1½	30	18	3	Apr. 15	June 20	2 bu.	50-70
	Davis' White Wax						July 15	Sept. 15-Frost	2-2½ bu.	95-100
Pole Green	Kentucky Wonder, Old Homestead	½ pt.	1-1½	36	30	10-30	May 1-20	Aug. 5	2-2½ bu.	95-100
Bush Lima	Fordhook	½ pt.	1-1½	30	30	10	May 1-July	Aug. 1-Frost	2 bu.	110-120
Pole Lima	King of the Garden	½ pt.	1-1½	48	36	36	May 15	Aug. 1-Frost	2 bu.	110-120
Beets—early	Crosby's Egyptian	1 oz.	1	28	15	2-3	Apr. 1	July 15	2-2½ bu.	45-60
Late	Detroit Dark Red						July 20	Nov. 15		
Cabbage—early	Jersey Wakefield, Copenhagen Market	1 pkt.	½	30	30	18	Apr. 15	July-Sept.	45-55 heads	100-120
Cabbage—late	Danish Ball Head, Succession	1 pkt.	½	36	30	18	July 1	Oct.-Nov.	45-55 heads	120-150
Cantaloupe	Early Knight, Fordhook	½ oz.	1	54-60	40	48 hill	May 15	Aug. 10	6-8 fruits per hill	90-110

Carrots	Chantenay, Oxheart	1 oz.	½	30	15	1-1½	Apr. 1 July 1	Aug. 1 Nov.	2 bu.	65-90
Celery	Golden Self-blanching, Easy Blanching	1 pkt.	¼	36	30	6	June 1	Sept. 15	200 stalks	120-150
Corn–early	Golden Bantam, Howling Mob	¼ lb.	1	36	30	15 or 30 hill	May 1	July 12	4 doz. ears	60-75
Corn–early	Golden Bantam, Howling Mob	¼ lb.	1	36	30	15 or 30 hill	May 1	July 12	4 doz. ears	60-75
Corn–late	Golden Bantam, Evergreen	¼ lb.	1	36	30	18 or 30 hill	June 15 July 1	Aug. 20-Frost	4 doz. ears	75-90
Cucumber	White Spine, Davis Perfect	½ oz.	½-1	48-60	48	48 hill	May 15	July 10 Aug. 20	200 cucumbers 1½ bu. pickles	60-75
Eggplant	New York Improved, Black Beauty	1 pkt.	½	48	48	48	June 1	Aug. 20-Frost	125 fruits	140-160
Endive	Green Curled, Broad Leaved Batavian	1 pkt.	½	30	18	56	Apr. 15 July 15	June 15 Oct.-Nov.	65 plants	60-90
Kale	Scotch Curled, Siberian (over winter)	1 pkt.	½	30	18	18	Apr. 1 Sept. 1	June 1 Apr.	60 bu.	55-65
Kohlrabi	White Vienna	1 pkt.	½	30	15	3-4	Apr. 15	June 15	2 bu.	50-70
Lettuce										
Spring and fall	Green-leaved Big Bos.	1 pkt.	½	18-20	15	14-18	Apr. 15-June 1	Aug. 15-Oct.	70 head	70-90
Summer	N. Y. Salamander	1 pkt.	½	18-20	15	14-18	May 15	June 1	70 head	70-90
Romaine	G. R. Exp., Trianon	1 pkt.	½	18-20	15	14-18	Aug. 1	July-Aug.	70 head	70-90
Okra	Perkins Long Pod	1 oz.	1	36	30	10-15	May 15	Aug. 10	900-1000 pod	90-140
Onion sets	Yellow Strasburg, Japanese (Eberheser)	1 qt.	1	18	14	1	Apr. 1	May 15	140 bunches	45-75
Onion seed	Yellow Globe Danvers, Southport Globe	1 oz.	½	18	14	1	Apr. 1	Aug. 20	1½-2 bu.	110-130
Parsnips	Hollow Crown	½ oz.	½	18	15	3-4	Apr. 1-May 15	Sept.-Nov.	2 bu.	140-160
Peas	Little Marvel, Laxtonian, Telephone	1 pt.	1-1½	30	30	2	Apr. 1-15	June 10-July	2 bu. (in pods)	45-70
Peppers	Ruby King, Pimento	1 pkt.	½	36	30	18-20	May 15	Aug. 15-Frost	5 bu. (6 per plant)	125-150
Potatoes	Irish Cob., Green Mts.	½ pkt.	3-4	36	36	14	Apr. 15	July 1	3 bu.	90-120
Pumpkins	Cheese, Small Sugar	1 oz.	½	60	60	48	May 15	Sept. 1-Frost	75 pumpkins	70-90
Radish	Scarlet Globe, Icicle	½ oz.	12	15	5	1	Apr. 15	June 1	100 bunches	30-65
Rhubarb	Victoria	Roots	5-6	48	48	48	Sept. 1 Mar.-	Oct. 25 May-	8-10 stalks	1 yr.

							Apr.	Nov.	plant	
Spinach—spring	Bloomsdale, Savoy	½ oz.	½	20	15	2	Mar.	May	3 bu.	45
Spinach—summer	New Zealand	1 oz.	1	48	36	36	Apr. 15	June 15	Cut all summer	65-120
Spinach—fall	Va. Dis., Resist. Savoy	½ oz.	½	20	15	2	Aug.15-Sept. 15	Oct.-Nov.	3 bu.	50-60
Squash—summer	Gold. Sum. Crookneck, White Bush Scallop	1 oz.	1-1½	48	48	48	May 15	July 10	136 squash	60-70
Squash—winter	Boston Marrow, Warted Hubbard	1 oz.	1-1½	72	72	48	June 1	Oct.	75 squash	120-130
Sweet potatoes	Yel. Jersey	Plants	—	36	36	18	May 15	Oct. 1-10	3 bu.	140-150
Swiss chard	Lucullus	1 oz.	½	30	30	6	Apr. 15	June 5-Frost	Pull until frost	50
Tomatoes—early	Chalk's Early Jewel, Bonny Best	Plants	½	48	36	36	May 15	July 10-Aug.	4 bu.	120-150
Tomatoes—late	Matchless, Stone	Plants	½	48	36	36	June 1	Aug.l-Frost	4 bu.	150-170
Turnips	Purple Top Strap. Leaf	1 pkt.	½	24	15	2	Apr. 1	June l	2 bu.	45-70
Rutabagas	Golden Ball,	1 pkt.	½	24	15	2	Aug. 1	Oct.-Nov.	2 bu.	45-70
	Lg. Island Improved	1 pkt.	½	24	15	2	Aug. 1	Oct.-Nov.	2 bu.	45-70

TABLE II [Pg 102]

AMOUNT OF SEED TO PURCHASE FOR FAMILY OF SIX[2]

Vegetable	Amount to purchase
Asparagus	66 plants
Beans, snap (in variety)	2 to 3 pounds
Beans, bush lima	1 pound
Beet	4 ounces
Cabbage:	
Early	1 packet
Late	½ ounce
Carrot	1 ounce
Cauliflower	1 packet
Celery	1 packet
Corn, sweet	2 pounds
Cucumber	1 ounce
Eggplant	1 packet
Kale	1 ounce
Lettuce	½ ounce
Muskmelon	1 ounce
Onion sets	4 quarts
Onion seed	1 ounce
Peas	2 to 4 pounds
Parsley	1 packet
Parsnip	1 ounce
Radish (in variety)	2 ounces
Rhubarb	20 plants
Salsify	1 ounce
Spinach	1 pound
New Zealand spinach	1 ounce
Summer pumpkin	1 ounce
Winter pumpkin	2 ounces
Squash	2 ounces
Tomatoes	1 packet or 50 plants
Turnip	4 ounces
Rutabaga	1 ounce
Watermelon	2 ounces

Planning and Operating a Home Garden.—In planning the home vegetable garden there are a few essential points to be kept in mind. The time to plan the garden is in winter when adequate consideration can be given to the selection of those vegetables that the family likes best and can [Pg 103]

use in large amounts. Seeds required should be ordered early for the entire garden. By drawing the plan of the garden on paper and following it, the procedure is simplified and the most efficient results attained.

Vegetables should be planted in rows rather than in beds, and those maturing at about the same time should be grouped together to facilitate succession planting. After the early-maturing crops have been harvested, other crops can be sown on the same area, thus fully utilizing the land throughout the growing season. Perennial crops, including asparagus and rhubarb, should be kept by themselves.

A practical farmer wanting to express perfection in soil preparation is apt to say, “It is just like a garden.” This implies good fertility, optimum moisture conditions and proper tilth. To attain these conditions in garden soil it is desirable to cover it with strawy manure some time previous to plowing, in order that rains may carry the soluble fertility elements into the surface inches of the [Pg 104] soil. In the early spring a thorough job of plowing or spading should be done to reasonable depth, completely covering the surface straw or dead plants. Every two or three years lime should be applied after plowing and worked into the top soil at the rate of 1 pound of hydrated lime to every 25 square feet of soil.

Fertilizing and Culture.—The fertility supplied through application of manure should be supplemented by the use of commercial fertilizer. This can be purchased in burlap bags from local supply agencies and should contain about 5 per cent nitrogen, 8 per cent phosphoric acid and 7 per cent potash. Moderate variations in analysis from 5-8-7, as above, are not important so long as the amounts of each element are well balanced. The fertilizer should be broadcast over the garden after plowing, at the rate of 1 pound to every 25 square feet and worked into the soil before planting. Poultry or sheep manure may be used as top dressing to alternate with commercial fertilizer. It should be borne in mind that such animal manures are richer in nitrogen than in other elements and if used to excess may stimulate leaf growth at the expense of yield and quality.

Frequent shallow cultivations are desirable. The ordinary wheel hoe will be found helpful in the [Pg 105] cultivating procedure. It should be well understood that cultivation is essential to prevent weed growth and conserve moisture.

If watering or irrigating is necessary in dry weather, it should be thoroughly done. One soaking of the soil to a depth of 4 to 6 inches is far more effective than frequent light sprinklings. The latter may be more harmful than beneficial through reestablishing capillary movement, permitting the escape of subsoil moisture. Water should be applied under the same conditions that apply when rain falls—on cloudy days or after sunset to prevent “baking” or encrusting of the surface soil as well as to conserve the amount of water needed.

Meeting the Insect Problem.—The sponsor of a garden in which diversified vegetables are grown must be prepared to meet the onslaught of equally diversified insect species. While it is true that insects are multiplying as to species and voraciousness, it is equally true that methods of control are becoming available to cope adequately with most of them. One unfamiliar with our insect infestations will be amazed to find that certain species apparently have had advance notice of his intentions and are sitting about the planted rows awaiting the appearance of the tender shoots.

One of the best methods of combating insects is to create ideal conditions for plant growth. Plants [Pg 106] that are underfed through inadequate soil fertility or are weakened by other causes suffer severely from insect attack, while vigorous plants will come through with much less damage. It is advisable to insure rapid germination of seed through careful soil preparation, to seed at the proper time for a quick and vigorous start and to have sufficient available fertility to stimulate growth once the plants have started.

There are two distinct classes of insects, the division being based upon their feeding habits. The larger group, both in the size of the insects themselves and in the number of species, is the leaf-chewing group. These can be destroyed by the application of stomach poisons to the plants under attack. The other group consists of the sucking insects, which penetrate the veins carrying nourishment to the leaves and appropriate it for themselves. Such insects multiply with extreme rapidity, generally feed on the underside of the leaves and may cause complete wilting of the plant before their presence is suspected. In such cases a “contact” spray or dust must be used. This is based on the principle of causing the insect to “inhale” the material through breathing pores along its body. The insecticide must be composed of extremely fine particles or must be of such an oily nature that it will readily penetrate such pores. In addition to these, certain repellent [Pg 107] materials are being developed which cause the insect to seek food where the disagreeable conditions do not prevail.

TABLE III

PRINCIPAL INSECTS AND REMEDIES[3]

Plants attacked	Chewing insects	Character of damage	Treatment
Tomato, pepper, eggplant, turnip, cabbage, etc.	Flea Beetles	They gnaw or eat small holes in the leaves.	Dust or spray with a prepared nicotine or pyrethrum mixture. Bordeaux mixture sprayed, or dusting for disease is also effective as a repellent. Dust with either arsenate of

Asparagus	Asparagus Beetle	Feeds on the shoots and brush.	lead or calcium arsenate, mixed with 1 part of wheat flour. Spray with arsenate of lead or calcium arsenate, 1 tablespoonful if a paste or ½ tablespoonful if a powder, and 1 tablespoonful of lime to 1 gallon of water.
All kinds of beans	Mexican Bean Beetle	Eats the under side of leaves	Dust with 1 part of magnesium arsenate mixed with 3 parts of lime, or dust the yellow larva under the leaves with a pyrethrum dust.
Early cabbage and cauliflower	Cabbage Maggot	.....	Keep the ground thoroughly cultivated around the base of the plant or use tar paper discs for larger plantings.
	Common Cabbage Worm and Cabbage Looper	Feed on the shoots and brush.	Same as for asparagus beetle. Pyrethrum dust is also very effective.
Cucumber, squash, and melons.	Striped Cucumber Beetle	Eats the leaves and the stem of the very young plants.	Protect with a cheesecloth or do the same as for the asparagus beetle.
Pumpkins and squashes	Squash Vine Borer	Kills the vines by eating in the stem.	Take a sharp thin-bladed penknife and slit the stem lengthwise, opening it and killing the borer. Then bank the ground around the stem of the plant.
Tomato, eggplant, potato	Potato Beetle	Eats the leaves.	Same as for Cabbage Worm.
Tomato	Tomato Horn Worm	Eats the leaves.	Same as for Common Cabbage Worm.
Tomato fruits	Tomato Fruit Worm	Eats the tomato fruits.	Same as for Cabbage Worm.
Tomato, eggplant, pepper, cabbage, and other crops.	Cutworms	Cut the plants off near the surface of the ground.	Protect with paper collars placed around the stem of the plant, extending 2 or 3 inches above the ground, or distribute poisoned bran mash, placing it near the plant. Thoroughly mix 2 level tablespoonfuls of paris green in 5 pounds of dry bran, then add from 4 to 6 quarts of water in which ½ pint of cheap molasses has been mixed. Cutworms work at night, therefore apply the mash in the late afternoon or evening.

[Pg 108]

Plants attacked	Sucking insects	Character of damage	Treatment
Tomato, potato, strawberries, and beans.	Leaf Hopper	Feeds under the leaf, causing a whitening and curve of the leaves with a dying of the	Dust or spray with a prepared nicotine or pyrethrum mixture. Bordeaux mixture is also effective as a repellent.

		edges.	
Practically all garden vegetable plants.	Aphis (plant lice)	Sucks the juices on the under side of the leaves and on the stems.	Either dust or spray with a nicotine or pyrethrum mixture as recommended on the package. Be sure to hit the insects on the under side of the leaves.
Cabbage group, strawberries, and beans.	Red Spider	Sucks the juices from the under side of the leaves, producing a whitish cast on the cabbage group and a brownish cast on the other groups. Especially prevalent during prolonged dry hot spells.	Apply a dusting sulfur.

Table III (pages 107-108) describes the character of damage done by both groups of insects, the plants attacked and the most effective methods of control. [Pg 109]

Do's

Grow vegetables for health, recreation and economy.

Organize the vegetable garden for a maximum of output, variety of foods and to facilitate its care.

Use lime and chemical fertilizer or manure liberally for intensive culture.

Combat insects by stimulating plant growth and by using appropriate lethal products.

Don'ts

Don't plant a garden in hit-or-miss fashion, if maximum food return is expected.

Don't neglect first appearances of insect damage. Find out the cause of injury and use recommended measures for control.

[Pg 110]

Chapter VIII

HOME FRUITS AND BEES

A WIDE variety of fruits may be grown satisfactorily for home use. Where no fruit trees are growing the best plan is to set out individual trees or bush fruits of the standard types and varieties, adding to the collection later as the needs of the family develop and the adaptability of the area for varieties manifests itself through crop production.

All fruits thrive best on a deep, well-drained soil. It is difficult to secure good results where the area is depressed and air drainage is poor. Elevation of the area planted is desirable therefore from the standpoint of both water and air drainage.

A number of questions confront the prospective grower of fruits. He needs to know, among other things, the kind of fruit to plant, the necessary distance between the trees or plants and the probable yield. The following planting guide will be found helpful in answering these questions.

[Pg 111]

Average number of plants to the acre	Kind of fruit	Distance between rows, feet	Distance between plants, feet	Estimated yield at maturity	
				Average per acre	Average per plant
27	Apples	40	40	135 bushels	5 bushels
90	Pears	22	22	90 bushels	1 bushel
200	Quinces	16	16	100 bushels	½ bushel
90	Peaches	22	22	90 bushels	1 bushel
90	Nectarines	22	22	90 bushels	1 bushel
90	Plums	22	22	90 bushels	1 bushel
90	Cherries (sour)	22	22	90 bushels	1 bushel
48	Cherries (sweet)	30	30	50 bushels	1 bushel
6,000	Strawberries (matted row)	3½	2	2,250 quarts	¾ pint per stool
1,800	Raspberries	8	3	2,000 quarts	1 quart
1,800	Blackberries	8	3	2,400 quarts	1¼ quarts
1,200	Dewberries (hill system)	6	6	1,800 quarts	1 quart
1,800	Gooseberries	8	3	5,400 quarts	3 quarts
1,800	Currants	8	3	3,600 quarts	2 quarts
680	Grapes	8	8	4,000 pounds	6 pounds

The selection of varieties of tree fruits is highly important. Some sorts are preeminently adapted to home use because of their high quality of edibility while others are preferred for commercial production on account of their good shipping qualities and high yields per acre. It is advisable for the grower to inquire of his state agricultural college regarding varieties to plant. Responsible nursery firms will also advise on varieties that will best meet the needs of the purchaser from the standpoint of family use and adaptability to soil and climatic conditions. [Pg 112]

The following varieties are recommended for general home use in north-central areas of the United States, subject to check by local authorities. The apple and peach varieties are given in the order of ripening.

Apples:
- William
- Wealthy
- McIntosh
- Rome
- Stayman

Peaches (all freestone):
- Golden Jubilee
- Georgia Belle
- Elberta
- J. H. Hale

Pears:
- Bartlett
- Seckel

Cherries:
- Montmorency or Early Richmond (sour)
- Black Tartarian (sweet)

Plums:
- Damson (blue)
- Burbank (red)

About fifty strawberry plants will be needed for a row 100 feet long. Because of weed infestations in old beds, it will be more satisfactory to set a new row each year and destroy the old one. The plants during the season of setting should be trained to form a matted row about 2 feet wide. Mulching the plants after a freeze in the fall with straw or other similar material will prevent injury caused by “heaving” of the soil. [Pg 113]

Currants and gooseberries should be pruned annually and only the one- or two-year-old wood retained for production. Thinning out in this manner will give better size and quality. Where the currant worm is troublesome the foliage should be dusted with arsenate of lead or Paris green as soon as it is well developed and before the fruit is started. About thirty currant or gooseberry plants will be needed for a 100-foot row, and they can be planted along a fence or other boundary line.

Blackberries and raspberries should be set 3 feet apart in the row, 100 feet requiring thirty to thirty-five plants. Old canes should be pruned out after fruiting and the weaker new canes should be removed when dormant, leaving 6 or 8 inches between the standing canes. Lateral branches should be cut back in early spring to about 1 foot in length and the upright canes cut back to uninjured wood, thus removing about two-thirds of the growth.

Grapes need severe pruning to produce satisfactory yields of good quality. This is best done in late winter. It is a good plan to prune so that from 15 to 30 or possibly 40 buds are left on each mature vine, depending upon the vitality of the plant. Two or three clusters of fruit will develop on the shoot that grows from each bud. A 100-foot row of grapes will require twelve plants. There are many fine varieties of grapes and several can be used in a single row. [Pg 114]

In ordering stock for planting, care should be exercised in making sure of the reliability of the nursery. As a general rule it is better to order from a nursery in the vicinity, thus eliminating losses due to shipping great distances and also making sure that the varieties or strains were grown for use in the area in question. Upon the arrival of the stock from the nursery, it should be "heeled in" at once. That is, the roots should be covered in a trench so that they will not dry out before they can be planted in the desired location. In the case of a few trees that can be set immediately, this is not necessary.

Nearly all country places have sufficient area for planting small fruits and, as is the case with vegetables, freshness and fine-flavored varieties will compensate for the labor involved in growing them. Strawberries, currants, gooseberries, blackberries, red and black raspberries and grapes are especially desirable for home plantings. Some high-quality varieties are given for the choice of the home owner, subject to confirmation by authorities acquainted with specific conditions and intended primarily for home use. [Pg 115]

Strawberries (in order of ripening):
Howard 17
Fairfax
Aberdeen
Joe
Chesapeake
Mastodon is recommended for the everbearing type.
Currants:
Fay
Wilder
Gooseberries:
Chautauqua
Poorman
Blackberries:
Russell
Ward
Eldorado for bush types
Black Diamond for the trailing type requiring a trellis and ripening late in the season.
Red Raspberries (in order of ripening):
Ranere
Viking
Latham
Black Raspberries:
Cumberland
Quillen
Grapes (general list, in order of ripening):
Ontario (white)
Fredonia (black)
Delaware (red)
Brighton (red)
Golden Muscat (white)
Concord (blue)
Sheridan (black)
For those desiring a succession of blue-black varieties, Fredonia, Concord and Sheridan are recommended.

Controlling Insect and Fungous Pests.—Plant pests of various kinds infest tree fruits and small fruits. In general, the best method of controlling leaf-chewing insects is by applying arsenate of lead on the foliage. Care must be taken to avoid staining the fruit with poisonous spray or thorough washing will be necessary before it is safe to consume. The control of other insect pests and fungous plant diseases has been well worked out by agricultural experiment stations throughout the country, and these methods should be sought before attempting any campaign of suppression. A barrel spray pump, mounted on a hand truck or on a vehicle, equipped with plenty of hose will be found satisfactory for spraying plantings of modest size. [Pg 116]

Rejuvenating an Old Orchard.—The purchaser of an old-established farm will usually find he has acquired some apple trees of uncertain age and health. In many instances these trees can be renovated and rejuvenated so that they will again bear fruit. If the trees have several sound limbs and are making some growth each year, they may be considered worth saving. On the other hand, broken tops and limbs accompanied by large rotted cavities will create too great an expense if an attempt is made to restore them to usefulness. The varieties should be determined before serious efforts at renovation are undertaken, so that the strenuous work necessary for restoration may not be wasted on undesirable fruit. [Pg 117]

Steps in Renovation.—The first operation in renovation is pruning. Most of this should be done in early spring during the dormant season and supplemented in June or July when the trees are in leaf. Large broken limbs and dead wood should be removed, together with interfering branches, and those reaching too high should be headed back. At about the same time that pruning is started the loose bark should be thoroughly scraped off and burned, thus destroying insects and fungi that attack the fruit. Harboring places for further infestations are also thus removed. If the trees are badly in need of pruning, it is best to do the job over a period of two or three years rather than all at one time, due to the tendency of trees to "sucker" and develop a multiplicity of small non-bearing branches.

Spraying, fertilizing and cultivation, where that is possible, should follow the pruning and

scraping jobs. Spray schedules and cultural practices best adapted to the region can be obtained without cost by applying to state or county agricultural agencies. Ordinarily two or three years are required to rejuvenate these trees and begin to secure a crop. Production will then increase in [Pg 118] quantity and quality during succeeding years.

Bees as Pollinators.—The production of fruits of all kinds is dependent upon pollination of their blossoms by bees and other winged insects. Bees of many species are useful in pollen distribution, but the most important is the honey bee, which is available in larger numbers just at flowering time, seeking nectar from the flowers. In large commercial orchards colonies of honey bees are set at regular intervals to insure adequate pollination, usually one hive per acre.

A practical method of adding to county life enjoyment and adding to income as well is the keeping of bees for honey production.

Securing a Honey Crop.—Bee husbandry can be carried on successfully as a specialized side line where only small areas of land are available. Colonies can be located at one side of the garden or placed under trees where they will not be disturbed either through accident or by cultivation of the plot immediately surrounding them. The activity of the bees during the nectar-gathering season, accompanied by the well-known hum as they dart in and out of the hive, makes a genuine appeal to the country dweller. This appeal is heightened by the fact that they are working for him, [Pg 119] in part at least, and without his having to pay for their raiding the nectar from the flowers around. He knows that his efforts in providing favorable working conditions for the bees will be repaid by a harvest of salable honey. A colony at full strength just at the right time will invariably gather a surplus.

First Principles in Beekeeping.—The beginner in bee husbandry should purchase established colonies from a reputable business concern or from beekeepers in the neighborhood of his home. He should begin in a small way with a few colonies, learn the business with a small investment and then increase as his liking for the work develops and the market for the product expands. Being able to read the signs at the entrance to the hive is the surest way to success. Too much manipulation is just as harmful as neglect. The novice in beekeeping who is really interested and follows carefully a few details gained from a reliable bee book should harvest at least 30 pounds of honey a year from each colony. Experts get much larger yields and have been known to secure 200 pounds per colony and 200 sections of comb honey from one hive. The deciding factor in producing honey is the skill of the watchful beekeeper, assuming of course that there is a sufficient supply of nectar-secreting blossoms in the area. [Pg 120]

The cost of engaging in bee husbandry is nominal. An established colony of the preferred Italian bees should cost about $8. The equipment should include two fitted supers for each colony in which the bees may store the honey, costing about $3 each; a veil to protect the head and face, linseed-oil-soaked canvas gloves, a bee smoker, a hive tool and a bee escape (needed for removing the bees from filled supers), each item costing less than a dollar. An additional piece of apparatus, a queen “excluder,” is needed for each hive, to keep the queen in the lower chamber and prevent the mixing of stored honey surplus and developing bees.

The principal nectar-secreting plants are the clovers, sumac, buckwheat, cranberry and blueberry blossoms, goldenrod, asters and mallows. Since these plants bloom at varying periods during the growing season, the beekeeper will find it necessary to adjust his operations in accordance with the nectar-producing capacity of his own region. The experience of successful beekeepers will be found helpful as a guide in taking the successive and orderly steps necessary to secure maximum honey crops. In many states there are associations of beekeepers formed for mutual advantage [Pg 121] and the promotion of the industry. The novice can hardly expect to learn unless he affiliates himself with such groups and attends their meetings. Subscription to a good bee journal is also desirable.

Larger Image

Colonies of honey bees located near the source of nectar supply.

Selling the Product.—Honey can be marketed in the comb or in glass jars in the extracted or crystal form. Many suburban beekeepers dispose of their crop in their own neighborhood or at roadside stands. Many food products are being promoted which contain honey as one ingredient, and this opens an attractive field to the resourceful beekeeper. The healthful qualities of honey

for human consumption are being given greater recognition and it appears that the market for locally produced honey of high quality is steadily expanding.

Do's

Fruit trees should be included in every country homeowner's plan.

Be sure varieties are such as will yield, plentifully, good quality fruit.

Use bush fruits as ornamentals and sources of food to be put in cans.

Seek advice on fruit problems from the state agricultural college.

Old orchards may be rejuvenated under proper systems of management.

Use colonies of bees to pollinate fruit blossoms and to produce honey. [Pg 122]

Begin bee husbandry in a small way at first and get advice from experienced bee culturists.

Sell surplus honey in home markets.

Don'ts

Don't plant varieties of fruits that are ill adapted to climatic conditions.

Don't overlook the necessity of preparing for insect attacks in advance of appearance.

Don't establish bee colonies without making sure that proper care of them can be taken.

Don't try to practice horticulture or bee husbandry without frequently obtaining expert advice.

[Pg 123]

Chapter IX

POULTRY AS A SOURCE OF INCOME

THE MAJORITY of the owners of small farm properties are interested in the possibilities of poultry keeping as a means of adding to the family income. Efforts in this direction are logical from a number of angles. For example, the keeping of poultry appeals to them as an interesting line of work for the sake of the activity itself. Furthermore, the cost of housing a comparatively large number of laying hens is not expensive, as compared with the investment required in other agricultural enterprises. Again, there is a ready market for the eggs and for the poultry in the neighborhood where the enterprise is carried on. No doubt, too, the more or less fabulous stories of easy profits have stimulated a desire to get into this business and to make it a rather important source of income. Again, there is the thought that the work involved in feeding and caring for the flock can be carried on by another member of the family when the owner or principal bread-winner is engaged in some other activity temporarily.

All these factors have tended to develop in the mind of the settler in the country a pretty definite idea that he can supplement the family income with poultry. Sometimes this idea is erroneous and there is apt to be little definite knowledge on the part of the new owner as to costs, problems and profits that are likely to accrue. It is the thought of the writer to outline some definite recommendations for the prospective poultryman which will enable him to safeguard his investment and prevent the very serious losses that have occurred to many who have not taken into consideration all of the factors involved. [Pg 124]

Soil Type.—The prospective poultryman will, if he is wise, make sure that the soil is adapted to the project. The ideal soil for poultry raising is sufficiently porous to furnish good water drainage and yet not so open or sandy as to be incapable of crop production. A porous soil is warmer than a clay soil and is more conducive to good sanitation through permitting moisture and debris to be carried quickly to the subsoil. If the subsoil is of a gravelly nature the natural condition will be improved. Presumably the same type of soil that will bear the poultry plant should be capable of producing garden crops, growing shade or fruit trees satisfactorily and producing grass and short-rooted crops that can be used in conjunction with the poultry plant or the beautification of [Pg 125]

the home surroundings. Consequently, the soil type must be productive and capable of improvement while being well drained and conducive to good sanitation. Heavy clay soils or those with rock strata close to the surface are to be avoided.

Successful poultry farms are operated on both level and rolling lands. Extremely flat topography should be avoided and also precipitous slopes. If the site is on rolling land the poultry plant should be located on a slope with southern exposure to secure warmth, quicker drying conditions and protection from cold north winds.

Breeds of Poultry.—Fowls have been domesticated and bred for ages all over the world. As the result of various crossings a large number of types or breeds of poultry are available for present-day use and propagation. Some of these breeds are maintained for show or novelty purposes only and furnish an interesting field for the fancier.

For the person who is engaging in the commercial poultry business the choice of breed narrows to a very few utility types. For purely egg-producing purposes or for broilers weighing slightly over a pound at killing time, the light Mediterranean breeds are the most efficient. Less feed is [Pg 126] needed for maintaining the egg machine itself and less room per bird required. Of these so-called egg breeds, the White Leghorn is in a class by itself. This breed is noted for its large white-shelled eggs which top the markets where this color egg is in demand. In the most intensive egg-producing areas of the country the White Leghorn predominates. On the other hand, this breed is not a good meat producer, the mature birds being light in weight.

For the dual purpose of egg and meat production the American breeds are the most popular. The principal commercial types of this general purpose group are Plymouth Rocks, Wyandottes and Rhode Island Reds. In some instances crosses of these breeds are proving good layers and highly efficient meat producers.

The Rocks, Wyandottes and Reds have bright yellow skin, shanks and beak which are desired in market poultry. They are good winter layers, particularly, and some strains have been developed that rival the Leghorn in the number of eggs per bird. Both the White and the Barred Plymouth Rocks are popular among those seeking a dual purpose breed, and being slightly heavier than White Wyandottes and Rhode Island Reds they are preferred by many poultrymen. The latter two breeds are rapidly increasing in popularity and their best qualities are being brought out more [Pg 127] uniformly by careful selection of breeding stock in each case. All of these American breeds lay brown eggs.

In addition to the egg and the dual purpose types of poultry epitomized by the Leghorn and the Plymouth Rock, respectively, there are breeds which are primarily meat producers. Less attention is paid to the egg-producing ability of these than is the case with the others mentioned. The Brahmas, Cochins and Langshans stand in high regard as economical meat producers. The Jersey Black Giant is a more recent addition to the popular heavy breeds, especially for the capon trade.

These Asiatic types grow slowly and are phlegmatic in movement so that they utilize feed for the economical development of high quality meat and attain great weight. For broilers of more than 1½ pounds each, for roasting chickens and for capons, the dual purpose breeds are becoming more popular than the extremely heavy breeds due to their more rapid growth and more popular weight average at marketing time.

Buying Stock.—The advantages of buying and maintaining definite breeds of poultry are now so well understood that the mixed or mongrel flock is fast disappearing. Having decided which type of fowl is best adapted to one’s market and ideas, there is no difficulty in finding a breed that will [Pg 128] fit the need. As has been pointed out, the attributes of high egg production or fine quality of meat are inherent in certain breeds. A single breed means uniformity in color, size and shape of the eggs which increases their marketability. More attractive appearance of the flock and greater efficiency from feeding without additional cost are other advantages pertaining to standardizing the flock as to breed.

Stock may be acquired as day-old chicks, as ten- to twelve-week-old pullets or as adult birds ready to lay. Hatching eggs may also be bought if desired, but it will be found more satisfactory and just as economical for the inexperienced person to buy the hatched chick or the more mature birds. The hatching and brooding processes are fraught with difficulties which may be especially acute for the amateur. The greatest demand at the present time, and properly so, is for day-old chicks. A highly specialized industry has been developed for the purpose of supplying this demand and a reputation for reliability has been established by many concerns catering to this trade.

Poultry House Construction.—Where flocks of poultry are to be kept for egg production, special [Pg 129] laying houses must be provided in addition to brooder houses that will be needed in any case.

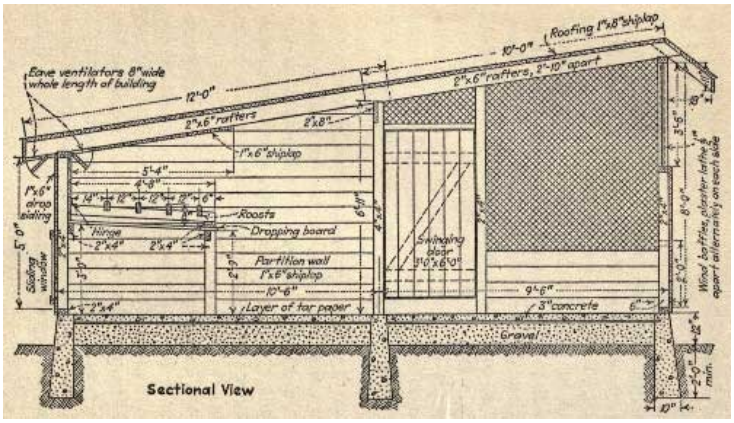
One of the best types of brooder house is the two-room type developed by Cornell University, Ithaca, New York. Such a house should be about 8 by 14 feet, and mounted on skids for convenience in moving. A movable partition divides the house into two rooms. Thus a cold room is provided for exercising and a warm room for sleeping. The marked difference in temperature between the two rooms helps to harden the chicks, while the reduced space about the hover conserves the heat.

A great deal of study has been given to the construction of laying houses for poultry. The purposes in mind have been to obtain maximum sunlight throughout the day, protection from storms and from dampness, and adequate ventilation.

In the construction of a modern laying house, 1 square foot of glass should be provided for every 20 square feet of floor space. The windows should be hinged so that they may be opened in warm weather. One of the commercial glass substitutes that are now on the market may be used instead of ordinary glass to allow violet light rays to reach the birds. The other openings permit free

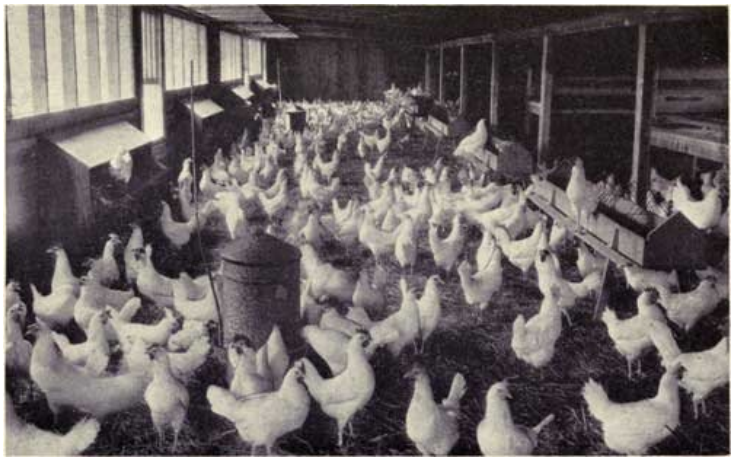
circulation of air through the house. They should be equipped with muslin curtains to be used during storms and in extremely cold weather. Such a house can be used the year round.

[Pg 130]



Larger Image

(*Courtesy of Poultry Tribune*)
This sketch shows an end view of a practical and inexpensive shed-roof laying house. Detailed blue prints for use in constructing such a house can usually be obtained from county agricultural agents or state agricultural colleges.



Larger Image

A fine flock of layers. The hoppers furnish laying mash and the fountains supply drinking water. Scratch grain is thrown in the litter.

The floor of the laying house must be dry at all times if vigor and health are to be maintained. During the winter there should be about 10 inches of dry litter in the form of straw, peat moss or shavings mixed with the straw. Small windows in the rear wall will make for better distribution of the litter, since the birds scratch away from the light. [Pg 131]

Equipment and Appliances.—A great deal of hand labor and daily drudgery can be eliminated by equipping the house with properly constructed appliances. These will not only save labor but will also supply the birds with their needs at the time the need for certain materials is felt and thus contribute to health and flock efficiency.

The best method of feeding dry mash is from a hopper. This should be so constructed as to hold a reserve supply at all times that will run into the feed trough as it is consumed. Care should be taken in construction to prevent the birds from throwing out the mash with their beaks and thus wasting it.

Water fountains of a standard type that will furnish the birds with a constant amount of fresh water are available at poultry supply houses. Receptacles should also be provided for grit, ground oyster shell and charcoal which can be easily filled. A sloping board should be placed over these receptacles to prevent the birds from roosting on them and soiling the contents. [Pg 132]

Bins so constructed as to be vermin-proof and moisture-proof should be available for storing the scratch grain and other concentrated feeds. Provision for storing litter where it can be kept clean and dry will be necessary. If long straw is to be used, a cutter operated by hand or by a motor will prove useful in fining the straw. The scratch grain will be spread through the litter on the floor, compelling the birds to scratch for it and thus obtain needed exercise.

Artificial Lighting.—Modern laying houses are equipped with electric lights that are turned on and off automatically. Artificial lighting prolongs the hen's working day when the days are short, resulting in greater food consumption and more exercise which will increase egg production and give better health and stamina at seasons when more eggs augment profits. A 40-watt bulb should be placed in one receptacle with reflector for each 200 square feet of floor space, located midway [Pg 133]

between the front wall and the front line of perches.

Investment Needed for the Start.—The prospective poultryman should be familiar with the principal items of cost before engaging in the business. To be thus forewarned is to be forearmed. The scale upon which one takes up commercial poultry production should depend upon experience in coping with the industry's peculiar problems and upon the amount of capital available. Success depends, of course, both upon skill in handling the poultry and upon the capitalization of the plant. It should be recognized that costs can be only approximate and are usable as guides only. They will vary according to geographical location, general economic conditions, labor costs and the bargaining power of the individual. The figures here given are for a plant comprised of 1,500 laying hens—the minimum number from which a living can be obtained and probably the maximum number that can be cared for by one person.

The houses for the flock will necessarily include a laying house of the multiple unit or other similar type, which should cost about $1,000. In addition, eight brooder houses will be needed to [Pg 134] care for the chicks and growing stock, costing about $100 each, or a total of $800. The growing stock when on range will need shelters for protection against hot sun and rain, and these should be built for about $25 each, or a total of $200, making a total cost for buildings and the necessary interior equipment about $2,000. In addition to this item, there will be needed about $1,500 for the purchase of pullets at $1.00 each, making a grand total of $3,500.

If baby chicks are purchased, it will be necessary to buy not less than 4,000 of these if the operator is to obtain 1,500 desirable laying birds. The cost of these chicks will depend upon the breeding that is behind them, upon whether they are blood-tested to eliminate bacillary white diarrhea (a scourge of young chicks) and the general care that has been taken in the hatchery to produce good, livable chicks. This care, incidentally, must extend to flocks from which the hatching eggs are secured, as well as to the final incubating process. Chicks sold at extremely low prices are rarely bargains. Quality is far more important than low first cost. Assuming a cost of 14 cents per chick as an average for chicks that will produce virile, productive layers, the initial investment for this item will be between $500 and $600. Therefore, if chicks are purchased, it will [Pg 135] reduce the item for stock from the amount of $1,500 given above, which would represent the cost of partly grown pullets.

Assuming that the complete poultry plant already stocked will cost $3,500, we must add to the budget of the prospective poultryman a sum for the purchase of a farm of from 5 acres upward, including a residence. In most localities a small tract with a modest house can be purchased for about $4,000. If only the land is purchased, that should be available at $200 an acre as a subdivision of a larger tract. Assuming that a house costing $3,000 will be suitable for the operator and his family, the total outlay will be in the neighborhood of $7,500. Experienced poultrymen estimate that a modest poultry farm of the type above described can be put into operation for an investment of $5 per bird. If it is planned to begin with a smaller flock than 1,500 individual layers, the same figures can be applied in proportion to the number of birds to be kept. In short, the poultry house and equipment should be estimated on the basis of not less than $1.50 per bird and the cost of the farm, residence and stock will be in addition to such a charge. The allowance of $1.50 per bird provides only for simple housing facilities for the flock.

Using these figures, it will be easy to understand the reason for the general recommendation that [Pg 136] a total investment of $10,000 is a requisite for a poultry establishment from which a modest living can be obtained. While the investment in housing, land, residence and stock may not exceed $7,500, there will need to be sufficient capital for paying the living expenses of the family until the flock begins laying and to enable the operator to purchase feed and other necessary adjuncts to his establishment before an income is obtained.

For a flock of smaller size than the so-called maximum one-man type above described, the costs per bird for the various items will apply in most cases. It is, in fact, advisable to begin with a smaller flock if the owner is inexperienced.

Do's

Poultry keeping must be efficiently carried on to yield returns to the country home owner.

Select well-drained soil that is free of infection.

For egg production, use the Leghorn; for both meat and egg purposes, the American breeds are best.

Standardize on one breed if possible.

Buy the best chicks or mature stock available.

Use a brooder house for the young birds.

The laying house must be well ventilated, fully lighted and easily cleaned.

Use latest mechanical feeding and watering devices to save labor. [Pg 137]

Employ artificial lighting to lengthen the hen's working day.

Work toward the “one-man plant”—a total of 1,500 laying hens—for mostefficient results.

Don’ts

Don’t try to raise poultry in buildings that may still carry infection.

Don’t economize by buying cheap chicks or breeding stock.

Don’t overlook importance of health factors and productive qualities in determining value of stock purchased.

Don’t try to operate a poultry plant with ill-adapted buildings and equipment.

Chapter X

[Pg 138]

SUCCESSFUL MANAGEMENT OF POULTRY

THE SUCCESSFUL poultryman will have set up his establishment with due attention to adequate housing, good stock, facilities for maintaining sanitation and for creating generally favorable conditions for egg production. His next problem will be that of adopting successful methods of management so that he may obtain a satisfactory net income from the investment.

Feeds and Feeding.—There are two groups of materials that are essential in food rations for all ages of poultry. The organic feeds include grains and grain by-products, hays, grasses and vegetables. The inorganic feeds include salt to increase palatability and digestibility of the ration; lime, to aid in building bone and body tissue as well as to furnish the shell material; bone ash, especially for growing chicks, and water in liberal amounts supplied by a fountain as well as from succulent green foods. The fact that a dozen eggs contain approximately one pint of water demonstrates the necessity of having drinking water before the flock at all times. [Pg 139]

The feeding of baby chicks, young stock and laying hens has been scientifically worked out by research and practical experience over a period of many years. The poultryman, especially if he is a novice, will do well if he carefully observes the recommendations of competent authorities. The ration for each of the three ages will consist of a grain feed and a dry mash composed of grain by-products reinforced with materials that supply the birds’ daily nutrition requirements.

The following rations and recommendations for management have been prepared by the New Jersey Agricultural Experiment Station, New Brunswick, New Jersey:

CHICK RATION

Baby Chick Grain

200 pounds finely cracked yellow corn
100 pounds cracked wheat

Fed morning and evening, beginning when chicks are 36 hours old.

Baby Chick Mash

20 pounds ground yellow corn
20 pounds wheat bran
20 pounds flour middlings
20 pounds pinhead oats
10 pounds meat scrap (50 per cent protein)
5 pounds dried buttermilk or skim-milk
2 pounds oyster shell meal or limestone flour or bone meal
2 pounds cod liver oil (mixed with the pinhead oats)
1 pound table salt

This mash is fed to the chicks as soon as they are placed under the brooder stove. It may be placed in hoppers. Let the chicks have all they want to eat; some of the mash should be before them at all times. [Pg 140]

Teach the chicks where to find the warmth by enclosing them for a few days with a ½ inch mesh wire one foot high and set from 10 to 12 inches from the edge of the hover.

Put some clean grit on bits of cardboard in several places around the hover when

the chicks are first brought from the incubator.

A little sour skim-milk or semi-solid buttermilk, diluted 1 to 7 in founts should be available from the beginning.

After the chicks are 60 hours old or when you are sure they are hungry, begin to feed, using cardboard in the same manner as before. Follow the feeding chart.

Feed little and often. Keep the chicks slightly hungry.

Watch for dead chicks and remove them as soon as they are noticed.

Attend to heaters early and late; be sure at all times that they are in good working order.

Clean out litter, particularly beneath the hover as often as it becomes soiled.

Induce exercise and keep the youngsters occupied.

Get them out-of-doors as early as possible, even if only for a few minutes in the warmer part of the day.

Feed green feed. Feed early and late. Keep the chicks growing.

Growing Stock Ration.—The baby chick mash can be used for feeding the growing birds, omitting the cod liver oil if they are on range. The baby chick grain ration can be used also during this period but it need not be so finely cracked. Plenty of grain should be available at all times. [Pg 141]

Laying Ration.—When the birds are getting ready to lay, the ration should be changed so that during the winter laying season the mash will include equal amounts of yellow corn meal, wheat bran, wheat middlings, ground heavy oats and meat scrap. Twenty-five per cent of dried buttermilk or skim-milk may be substituted for an equal amount of meat scrap.

The grain ration should consist of equal amounts of cracked or whole yellow corn and wheat. This should be fed in the late afternoon, giving sufficient to satisfy the appetites of the birds between the time of going to roost and a light morning meal. It should be fully consumed by eight o'clock in the morning. Adequate consumption of mash is a prime requisite in egg production. The feeding of semi-solid buttermilk at the rate of 3 to 5 pounds to 100 hens daily is recommended. Ten pounds of mangel beets per 100 hens or 1 square inch of well-sprouted oats per bird will supply needed green food during the winter.

In many cases it will be found more satisfactory to purchase ready mixed rations from a local dealer who handles reliable and scientifically compounded feeds for poultry. This is particularly applicable where the number of birds is of ordinary proportions. Little, if any, economy will be found in purchasing small quantities of each ingredient and attempting to thoroughly mix them at home. If the flock is very large there may be worth-while economy in home-mixing of the ration. The efficient poultryman will compare the cost of branded feeds with ingredient costs to guard against being overcharged. [Pg 142]

In addition to the standard rations the growing stock and laying birds should have access at all times to grit, shell and charcoal, kept in suitable containers. These may be obtained of the local dealer.

Sanitation.—When growing stock and laying hens are kept under modern intensive conditions the observance of the rules of sanitation is essential. Failure to observe them is likely to result in loss of production, serious sickness of the flock and the nullifying of all other constructive factors.

Dropping boards beneath the roosts must be cleaned frequently and regularly to prevent accumulation of filth. If the dropping boards are constructed of matched lumber with the boards running in the direction in which they are to be scraped it will facilitate the cleaning process.

Before the birds are placed in winter quarters the laying house should be thoroughly cleaned of all litter and debris. The interior may then be thoroughly sprayed with a disinfectant composed of some good coal tar preparation, and this repeated in the spring. The surface will need to be painted with a good disinfectant, of which there are a number of commercial preparations on the market. A close watch should be made for vermin in the house and on the birds, and if lice or similar parasites are discovered, immediate action should be taken to destroy both the adults and the eggs, since these parasites will debilitate the flock and prevent their development and may seriously check their ability to lay. [Pg 143]

Management of Artificial Lights.—The electric lights mentioned in the previous chapter should be turned on about four-thirty in the morning and kept on until daylight or used for an hour in the late evening. When lights are used there should be plenty of food and water available to enable the birds to take advantage of the additional feeding period. The scratch grain should be increased by 2 pounds daily for each hundred birds when lights are used. Many poultrymen find it advantageous to have a low wattage light burning all night so that hungry individuals may get a meal and return to the perches at all times. Three to five kilowatt hours per month for each hundred birds represents the average current consumption where lights are used. [Pg 144]

Practical Suggestions for Efficient Management.—A number of successful poultrymen were recently asked to state the requisites for success in the poultry industry, with particular reference to what is known as the one-man poultry flock. Such a flock is of adequate size to take practically the full time of one person in its operation. As the result of the development of standardized feeding practices, improved equipment and better methods of management, the maximum number of birds that can be successfully managed by one person has greatly increased in recent years. Likewise, the problems of proper feeding, adequate disease control and successful selling

have increased as the size of the unit has grown and as greater intensiveness is practiced.

All of the successful men questioned advised that the keeping of poultry should be begun in a small way in order that experience can be gained without the risk of losing the initial investment, or that the intending operator should gain practical knowledge of the business by working on a poultry farm for a year. Valuable knowledge can also be gained by attending short courses in poultry husbandry that are being offered at most agricultural colleges with a very moderate expenditure of funds. [Pg 145]

One of these successful men writes as follows: “We are working with a man now who was let out of a position recently but who has some savings and who desires to go into the poultry business. He has purchased six acres of ground, has built a bungalow on it and has the foundations in for three laying houses of 500 birds’ capacity each. He will have ample range for a two-yards system for each laying house, and, in addition, will have two ranges to alternate yearly for growing his young stock. His program calls for putting out about 2,400 chicks yearly from which he should have at least 1,000 pullets, which he will house in two of the laying houses. The following year he will carry over about 500 of these birds and can fill up with 1,000 pullets. This is to be a one-man plant with possibly some assistance in the spring.

“I feel that 1,500 birds is the minimum required from which one man can make a living, and five acres devoted to poultry, properly laid out, is sufficient area for this purpose. If more land is available, so much the better. These are minimum requirements, as I see it, and with regular feed deliveries directly to the poultry house, running water and other labor-saving devices, there is no reason why one man cannot successfully take care of this number of birds, particularly where a man is starting on new ground where there have never been any chickens and therefore less chance of disease. We advise buying baby chicks rather than partly grown or mature stock. If he follows a definite economic and sanitary program right from the start, there is no reason why his plant should not carry on profitably, indefinitely.” [Pg 146]

This practical man says further: “It is our experience that the majority of the people going into the poultry business go in ‘blind.’ Their chicken houses are put up irrespective of range facilities and then after two or three years when they begin to run into trouble they find their mistakes. I would suggest that you point out to prospective poultrymen the advisability of first, buying land and developing their own poultry plant rather than trying to make over someone else’s plant; second, buying in a location where buying and selling facilities have been developed; third, getting in touch with a reliable local poultryman for guidance in laying out his plant and following only one advisor. By hooking up with only one poultryman he is presented with one way of doing things which this poultryman has found successful in his own business.”

Another successful man states that the most economical time to start the business is in the spring when day-old chicks can be secured and purchased at a lower cost than is possible in the buying of laying stock at other seasons of the year. He further advises that the greatest mistake made by many starting in the poultry business is the lack of adequate capital. Too many invest all of their money before any income can be secured, according to this man. Should there be a set-back during the first year or two, there is no way of continuing and the whole investment may be lost. [Pg 147]

Still another practical man states that “Site is, in my opinion, the most important factor to be considered after the decision is made that a person wishes to go into the poultry business. Successful poultry keeping probably requires more careful selection of a farm than any other agricultural industry. There should be light soil with good air and water drainage and an area of sufficient size to permit shifting the poultry on different areas as a means of preventing disease infection and as a means of securing vigor in the birds.” He, too, points out that old poultry farms should not be considered by prospective poultrymen unless they have been approved by an expert in these lines, for the reason that these farms are frequently offered for sale because of persistent disease infection which it is very difficult to eliminate, or because of some fundamental difficulty, such as poor soil drainage. [Pg 148]

“In the construction of buildings,” continues this experienced poultryman, “sufficient housing should be provided to prevent overcrowding and the difficulties that come in the train of that condition. About three square feet of floor space per bird is required for the lighter breeds such as Leghorns, and four to five square feet per bird for the heavier breeds. For the one-man plant, the recommendation is for a maximum of about 1,500 birds. This would require from 4,500 to 5,250 square feet of floor space suitably arranged for the lighter breeds of the Leghorn type. For the young stock to be used as replacements, seven to ten brooder houses, 10 by 12 feet in size, would be required and about the same number of range shelters, usually 6 by 8 feet, for the purpose of sheltering growing young stock from hot sun and heavy rains when they are out on range.”

Probable Net Income.—Many persons who have started in the poultry business have been misled as to the amount of net income they will be likely to receive from a one-man plant. It is pretty well established that in normal times a net income of from $1,500 to $2,500 annually can be secured from a plant housing 1,500 birds. A great deal depends, of course, upon the skill of the operator, and a plant of this size requires the full time of one competent person. It should be borne in mind that this net income is in addition to the residence and such food as would be taken in the form of poultry products and from the garden. [Pg 149]

Sales Management.—Every prospective poultry keeper should determine the marketing possibilities for the product in the area under consideration before he makes a choice of location. There are at least four methods of marketing eggs and poultry meat, any one of which can be used exclusively or two or more used in combination as a means of disposing of the product to the best advantage. The system that he will adopt will depend largely upon his location, as well as upon his individual preference, and upon the facilities that are available in the area where he

operates.

In many sections of the country there are cooperative egg marketing associations where the eggs are received in bulk from the producers, are graded and marketed in large quantities, the producer receiving the full selling value less, of course, the costs of operating the distributing agency. In the northeastern states, egg auctions have been very successfully developed. Under [Pg 150] this system the individual producer brings his eggs to the auction market where they are graded and sold on the basis of weight, size and other factors pertaining to quality. In this method of selling the producer receives a definite price for his eggs less a small charge per case made by the selling agency.

A successful type of direct marketing is through roadside stands. This is especially successful in or near large centers of population where eggs can be purchased, together with other farm commodities, at the same stand. Another method is the operation of a retail route in which the producer sells the eggs by the door-to-door method in a near-by city. This method is followed successfully by many poultrymen who deliver eggs as regularly as the milk distributor or the baker deliver their products.

Still another method is the use of mail or express as a means of transporting the eggs to consumers in urban centers. This method, while largely in use some years ago, has not proved so generally successful as have some of the other methods previously given.

A well-organized program of work is essential in successful poultry keeping. The following schedule is followed by many successful poultrymen as a means of distributing their time to the best advantage during the day.

A Poultryman's Daily Time Table [Pg 151]

Based on a One-man 1,500-bird Farm Producing Market Eggs

7:00-8:00 A.M.— Feed and water all stock.

8:00-9:00 A.M.— Fill mash hoppers and clean dropping boards.

9:00-11:00 A.M.— Two hours for cleaning houses, cultivating yards, repairing of buildings, preparation of egg cases, packing eggs and miscellaneous jobs.

11:00-12:00 M.— Feed green feed and collect eggs.

12:00-1:00 P.M.— Lunch hour.

1:00-2:00 P.M.— Water all stock.

2:00-4:00 P.M.— Same work as from 9:00 to 11:00 A.M.

4:00-5:00 P.M.— Feed and collect eggs.

Ducks, Geese, Turkeys and Other Fowl.—While the raising and keeping of chickens occupy the largest and most important part of the general operation of poultry keeping, there is a growing interest in the production of other types of fowl, including ducks, geese, turkeys, and in some instances, guinea fowl and pheasants. Each of these really constitutes a separate and distinct poultry industry, requiring specific feeding, breeding and management practices. Some of the fundamental factors in the care of these types of poultry are given for the beginner. In the case of these fowl, as in chickens, it is essential to start in a small way and develop as experience dictates.

Ducks.—From a rather obscure and unknown source of poultry meat, the duck and the duckling have become common to restaurants and the home table. This has been accomplished through the operations of large commercial duck farms which sell hundreds of thousands of birds annually. [Pg 152] The selection of breed types, proper feeding and management and skillful marketing have made it possible to attract a wide public interest and an appetite for these fowls on a permanent basis.

The best known varieties of ducks are the Indian Runner, a small type and primarily an egg producer; the Muscovy and the Pekin, both of which are used for meat purposes, the former being best adapted to general farm use and the latter to intensive breeding on large establishments devoted solely to the purpose of duck raising. The old simile, "Like a duck takes to water," implies the fondness of ducks for the aquatic element. However, ducks will do well without swimming facilities.

Incubation of duck eggs can be carried on in the same manner as chicken eggs, except that more moisture is essential to good hatches. The period of incubation is 28 days for all types, except for the Muscovy, for which it is 33 to 35 days. The growing birds, like mature ducks, are hardy and ordinarily show a much lower mortality percentage than chickens. If only a few ducks are kept, they will follow the habits of a flock of chickens and need be given no special attention. When they are raised without other poultry an open shed is all that is necessary for winter quarters and [Pg 153] some shade arrangement for protection against hot summer sun.

The feed rations that have been given for baby chicks and growing stock can be used for ducks, or any standard commercial feed for the respective ages. It is recommended that the chick and growing mashes be mixed with fine, chopped greens such as cabbage or lawn clippings, and sufficient water added to the mixture to make it moist. One pound of sand or grit may be added to furnish the duck with grinding material. Fresh water in shallow dishes should be available during the feeding periods which ought to be three times a day. For the mature birds, the laying mash, previously given, and moistened, will be found satisfactory with fresh greens added, unless grass is available on range. Hoppers containing sand or grit should be available if a number of ducks are kept.

Geese.—Geese can be raised successfully wherever other types of poultry will grow. That they are

not so popular as ducks is shown by the fact that only about one-third as many geese as ducks are raised in this country. The most popular breeds, in order of popularity, are Toulouse, Embden, African and Chinese. The Toulouse is the largest and most favored, the mature gander weighing 26 pounds and the adult goose about 20 pounds.

Geese are usually kept in small numbers in areas where there is an abundance of grass and a [Pg 154] supply of water for swimming. They, like ducks, are hardy and are rarely affected with diseases or parasites. A plentiful supply of grass is sufficient feed for the growing goslings. The demand and prices for geese are lower than for most other types of poultry. For housing, only a shed in winter and a sun-shade in summer are required.

The period of incubation varies from 30 to 35 days, depending upon the size of the breed. The young goslings are easily killed by excessive moisture or may become lost and therefore they require considerable attention during the early stages. A good food for the goslings is stale bread soaked in milk or water, fed after they are 48 hours old. Scalded cracked corn may also be given or a mash made of four parts corn meal and one part grain middlings. Plenty of drinking water is essential. Whole grain may be fed after the goslings are well feathered. When the geese near the marketing period they should be kept in confinement and fed a moist mash made of one part grain shorts and two parts corn meal. A bedding of short straw will keep the fattening pens clean and provide roughage. Best prices are obtainable during the late fall and early winter months.

Turkeys.—Because the turkey is such a popular form of meat during the holidays and so much [Pg 155] attention is directed to it as an indigenous native bird, it rivals the American eagle as a national emblem. Turkey raising on a commercial scale has had its ups and downs for a great many years. One of the principal scourges has been the so-called black-head disease and this has destroyed the industry in many areas. It is now known that this disease is carried by a small parasitic worm common to chickens, which, however, it apparently does not seriously injure. The black-head germ, carried by this worm, clogs the blood in the head of the turkey and causes quick death. For this reason, it has been found impracticable to raise turkeys where chickens are present, unless they are kept entirely separate by confinement.

The principal varieties of domesticated turkeys are the Bronze, White Holland, Bourbon Red, Black, Narragansett and Slate. All are large, handsome birds, each breed having a following of admirers. The Bronze is the largest and heaviest and most popular, the mature adult male weighing 36 pounds and the mature hen 20 pounds. Under ordinary conditions turkeys do not require much in the way of housing, except in cold weather when covered roosting sheds should be available. The period of incubation is 28 days and they may be hatched under the same [Pg 156] conditions as chickens. The day-old young birds, or poults as they are called, can be shipped in the same manner as day-old chicks.

For feeding the poults, the United States Department of Agriculture recommends fine-chopped hard-boiled eggs, including the shell, mixed with green feed for the first ten days. This may be followed by feeding the chick ration previously mentioned. Milk, especially buttermilk, is excellent for the poults, and grit must be provided if it is not available on range. Cod liver oil will be found helpful if added to the ration. Turkeys are great rangers and travelers if they have the opportunity and will pick up enough insects to keep them going through the day. A grain ration should be fed just before they go to roost. Where they are raised in confinement, or semi-confinement, more food must be given and under these conditions the strictest sanitation must be practiced.

Both old and young turkeys should be protected from dampness, and the growing birds, especially, kept free from lice. The turkey grower who practices the best systems of management and feeding will be successful and will find a ready market for his product at Thanksgiving and during the Christmas holidays. A few birds may be successfully kept in confinement and used as a [Pg 157] home-raised source of high quality meat during a considerable portion of the year.

Guinea Fowl.—The guinea is known for its watch-dog proclivities, making a characteristic raucous noise when strangers appear; for the rich quality of the eggs which are produced in good quantity; and for the delectability of the breast meat when properly prepared. The young guinea may be fed as has been recommended for young chicks. The older birds are excellent foragers and require little attention. The country home owner, if he does not object to their noise, will find a few of these unusual birds an interesting and valuable asset.

Pheasants.—Many persons with a flair for the new and unusual are successfully raising pheasants, the Ring Neck variety being the most popular. While they are not so hardy as chickens and must be given some added care for that reason, they may be fed in the same manner and kept successfully in confinement. Pheasants may be used as an additional source of income since they are nearly always in demand for meat. The eggs may be hatched in incubators or by hens and the young pheasants brooded like chicks. The period of incubation is 21 days. Shelter is not necessary except in extremely cold weather and not then if trees or shrubs are available. Detailed [Pg 158] information on game bird production can be obtained from More Game Birds in America, Inc., 500 Fifth Avenue, New York City.

Do's

Net income depends upon efficient management and each phase of the latter must be mastered.

Feed a well-balanced chick ration to the very young and growing stock.

Be sure the ration fed to laying stock is adapted to their

needs in egg production.

Sanitation measures are fundamental in good management and their neglect may be fatal.

Follow the management recommendations of practical and successful poultrymen.

Use the marketing system best adapted to the locality and the personal factor of sales ability.

Determine possibilities of selling ducks, geese, turkeys and other fowl as a means of supplementing income from chickens.

Remember each type of poultry requires specific management.

Don'ts

Don't neglect scientific feeding of the poultry flock.

Don't go into poultry production on a large scale without experience.

Don't neglect local markets as outlets for the sale of eggs and poultry and don't make shipment of eggs and stock to commission houses of unknown rating.

Don't over-extend in poultry investment to the point where temporary reversal would be disastrous.

Chapter XI

[Pg 159]

THE FAMILY MILK SUPPLY

LIVING in the country should make possible an adequate and safe milk supply for the family. The transportation of milk from the farm and its distribution in the city constitute a costly process under present methods, and this limits consumption. Furthermore, the ordering in advance of a definite quantity each day means as a rule that only the milk delivered will be consumed. A maximum amount of milk is thereby set, based upon factors that may be alien to real needs of the family for this food beverage. Using milk and dairy products freely from a near-by supply will contribute much to the health of the entire family and especially of the children. The term "family" is used in this case to denote two or three adults and the same number of children.

Nutritional experts declare that milk is the most important of the "protective" foods. Scientists agree that milk protects by providing in the best form those necessities which are often lacking in other foods. Milk supplies calcium so necessary for sound bones and teeth, phosphorus, easily [Pg 160] digested protein, butter fat and milk sugar. Most important of all are the vitamins found in milk. Milk acquires these properties from the cow, a living factory manufacturing milk from raw products, which are the foods the cow eats—the pasture grasses and the cured hay, supplemented with carefully blended grain rations. Nutrition authorities recommend at least a quart of milk daily for every child and ample amounts for adults as well.

Sources of Milk Supply.—The country resident will have little difficulty in securing an adequate supply of wholesome milk at low cost. He may obtain it from a neighbor who is in the dairy business or he may maintain a cow or two where the area is large enough to provide some pasturage and where a building for stabling is available.

If the milk is bought from some near-by farm it is important that the purchaser assure himself of the health of the cows producing the milk and of the sanitary conditions surrounding production and handling. Quality in milk is much more than cream content. Cleanliness in production and handling is far more important, and this the country resident can personally determine by occasional visits to the source of supply, an advantage difficult for the urban resident to attain. Quality in milk is not necessarily measured by the investment in the milking barn or the showy [Pg 161] external features of the producing and handling plant.

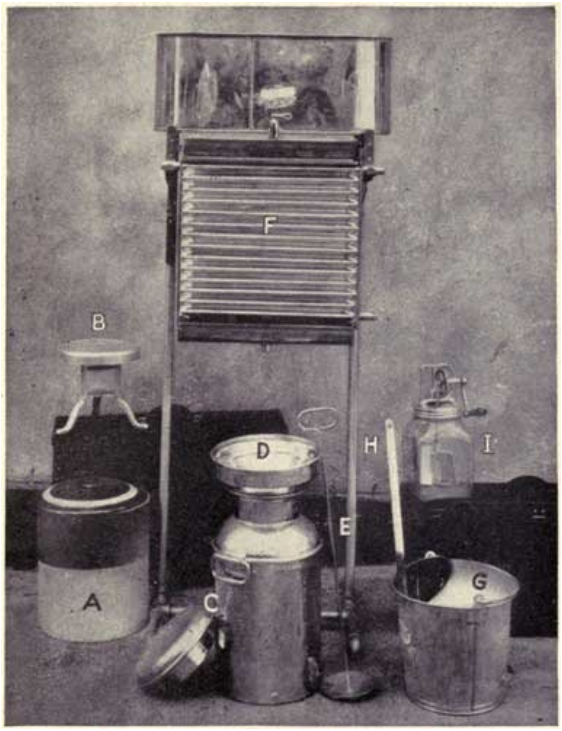
The essential factors in the production of clean, wholesome milk are healthy, clean cows; healthy milkers; clean, sterile utensils; and sanitary stables and premises. These conditions can be attained by any careful dairyman and can be checked by any layman interested in securing a dependable supply of safe milk. The purchaser should insist that the cows be tested regularly under government supervision for tuberculosis and the reactors to the test removed from the herd. This is important in all circumstances and particularly so where the milk is consumed in the unprocessed state by children.

Producing Milk at Home.—It is entirely feasible for the rural family to produce at home an ample supply of milk at low cost. To do this it is only necessary to have stabling facilities for one or two

cows and to have a member of the family sufficiently interested to feed, care for and milk the cow or cows. If this plan is to be followed the owner, if he is inexperienced, should enlist the aid of a neighbor or friend in making the purchase. The animal should be fresh, that is, just starting the period of lactation, and preferably not more than four or five years of age. A cow that is fresh can be judged as to ability to produce good milk from all four quarters of the udder in adequate amount. [Pg 162]

Selecting the Family Cow.—The breed to be selected is not important, except that for family use a cow of the so-called Channel breeds (Guernsey or Jersey) is considered better adapted because of the higher butter fat content of the milk as compared with the Holstein-Friesian, for example, which usually produces a larger total quantity of milk with less butter fat. It is not necessary to purchase a pure-bred animal of any of the breeds, so far as milk production is concerned. On the other hand, a pure-bred registered cow may often be purchased at moderate cost. The owner will undoubtedly take greater pride in such an animal and her offspring will have higher selling value.

In making a purchase the new owner should insist upon having a tuberculin test chart delivered with the animal, and certification as to freedom from contagious abortion (B. abortus) should also be obtained if possible. If production records have been kept during the animal's previous lactation periods, these should be secured, as they will definitely indicate milk-producing ability over a considerable period of time. For family use a cow that produces milk steadily in uniform amounts over eight or ten months is far more desirable than one which produces a large volume following freshening and then slumps off rapidly. [Pg 163]



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Desirable types of utensils for a small dairy. *A.* Crock for temporary milk storage or for gravity separation of cream. *B.* Milking stool. *C.* Twenty-quart milk can and cover. *D.* Strainer. *E.* Stirrer. *F.* Circulating water cooler for freshly drawn milk (not essential for a one- or two-cow dairy if other cooling practices are followed). *G.* Sanitary covered-top milk pail. *H.* Measuring rod. *I.* Small churn for family butter making.

Importance of Pasture.—Pasturage plays so important a part in economical milk production and in contributing to the health of the animal that it is unwise to consider keeping one's own cow unless 3 or 4 acres of pasture land per animal are available. When the cow is on pasture from May until November no other roughage is required, provided of course the grasses and clovers are plentiful. Plenty of water is essential, and if this is not made available by a stream in the pasture, it will be necessary to furnish drinking water three times daily.

Stabling and Feeding.—From early November until May it will be necessary to provide stabling facilities, roughage in the form of hay, ensilage or beet pulp, and concentrated feed to keep the animal producing. About 3 tons of good timothy-and-clover hay or alfalfa will be needed per animal during these six months. Storage room will be needed in the building for the hay and for the concentrated feed. A good practice is to keep the cow in a box stall 12 by 14 feet in size. Ample bedding should be provided, consisting of straw, wood shavings, shredded corn stalks, peat moss or dried leaves. These will absorb the liquid manure and after such use should be applied to the garden or other land areas for fertilizing purposes. [Pg 164]

The daily ration of the cow when stabled will consist of from 15 to 25 pounds of hay daily and 1 pound of concentrated feed for each 3½ pounds of milk being produced. (A quart of milk weighs

about 2.2 pounds.) Milk flow can be stimulated and the health of the cow conserved by feeding moistened beet pulp, where silage is not available. This may be purchased locally at the feed store, where the grain concentrate may also be obtained. The latter can be bought in bags and a mixture analyzing about 20 per cent protein is recommended. When the cow is on pasture the grain ration may be reduced by one-third or one-half, depending upon the quality of the pasture available.

Cost of Milk Production.—Where all of the feed mentioned above is purchased, the cost per quart of the milk will approximate 3 cents, excluding labor and overhead costs of buildings, etc. This cost can be reduced if pasture does not have to be rented and if some of the other food requirements are raised at home.

Management.—Feeding the cow twice daily and milking at the same interval will give the best results. Morning and evening are usually the most convenient times for milking and the same [Pg 165] hourly routine should be observed daily. Feeding the grain ration after milking is desirable. A good practice is to furnish hay and beet pulp between milkings.

To insure cleanliness of the milk, the udder and teats may be wiped with a damp cloth before milking. Flanks and the udder should be clipped of hair, thus facilitating a clean condition of the animal at all times. Soiled bedding should be removed and clean material substituted as required.

The normal cow should produce an average of 10 quarts of milk daily over a period of ten months. In the remaining two months the cow will not be producing milk but will be resting and building up body reserves for the coming period of lactation. The cow should be bred about nine months before it is desired to have her bear a calf. The time of year when such freshening should occur is not important, although either spring or fall months are considered best, to avoid weather and temperature extremes at the critical calving period. Under this plan it will be noted that the family will not have milk from home sources for two months during the year. The alternative is to have two cows, one freshening in April and the other in October, ensuring a continuous supply, or to purchase milk during the “dry” period.

Utilizing a Large Supply of Milk.—The urban consumer of milk accustomed to 1 or 2 quarts daily [Pg 166] may wonder how an average of 10 quarts or more per day can be utilized. Plenty of uses will be found for the product. Milk will be used more often as a beverage; cream will be found delightful in many ways, in the form of butter and home-made ice cream, for example; and cheeses will provide an outlet for surplus whole or skimmed milk. Milk of good quality can be disposed of readily to neighbors. If two families own one cow each, a plan may be worked out for furnishing each other with milk when one cow or the other is not producing. Wherever facilities are available and there is a willingness to care for a family cow or two, the availability of large amounts of milk will compensate for the trouble and bring health and vigor to the rural family.

The Goat as a Source of Milk Supply.—The milk goat is especially useful to those who desire a smaller quantity of milk than that produced by a cow and where the space is inadequate for keeping a larger milk-producing animal. In composition, goat’s milk closely resembles that of the cow, the butter fat ranging from 3.2 per cent to 4.4 per cent with total solids of nearly 12 per cent. The average production of a good milk goat is about 2 quarts of milk daily, sufficient for [Pg 167] many a family. The milk is pure white in color and the cream rises very slowly. If goat’s milk is properly produced and handled, the bad odor, associated with the animal in the public mind, should not be present. Keeping dirt or hair out of the milk when it is being drawn, and clean quarters, are essential in eliminating odor in the milk. It has been proved that goat’s milk is especially valuable for children and invalids and exceeds cow’s milk in ease of digestibility.

Goats are in their prime at about five years of age, but will continue to produce milk for several years after that. They should be bred twice a year. The usual number of kids is two, although occasionally four are born at one time. The period between breeding and giving birth is about five months. Goats may be successfully fed with the same rations as the dairy cow. Although they consume only about one-seventh as much feed as the cow, the common impression that the goat can produce milk on practically no feed is erroneous. A ration for winter feeding, suggested by the United States Department of Agriculture, consists of 2 pounds of alfalfa or clover hay, 1½ pounds of silage or roots and from 1 to 2 pounds of a concentrated grain ration, composed of 100 pounds of corn, 100 pounds of oats, 50 pounds of bran and 25 pounds of linseed meal. In the [Pg 168] summer when pasture is available they should be fed 1 to 1½ pounds of the grain mixture. Data from experiment stations indicate that the annual feed cost of a milk goat is about $11 and the feed cost per quart of milk produced, about 1½ cents.

Good milk goats bring good prices and in most instances will cost almost as much as a cow. They are much more prolific, however, permitting more rapid additions and offering greater revenue from the sales of young animals, wherever there is a market for them. The two principal breeds are the Toggenburg and the Saanen, both originating in Switzerland, and the Spanish Maltese whose original home was in the island of Malta. Goats are thoroughly domesticated, are contented with a small grazing area and may be easily handled. They are subject to stomach worms, indicated by loss of flesh and weakness, and to Malta fever, which can be transmitted to man, in whom it is evidenced by recurring high temperatures. The former can be controlled by using, as a drench, a copper sulfate solution of 1 ounce to 3 quarts of water. Where the latter trouble is present the milk should be pasteurized or scalded before it is consumed. As an economical source of easily digested milk, the goat is recommended, especially to those families with rather small acreage. They can make the most of poorer pasturage, are clean in habits and [Pg 169] docile.

Do's

Use milk freely for its food value to every member of the family.

Make sure of the quality of the milk purchased.

Acquiring a family cow is the best and cheapest source of an adequate milk supply.

Management of the right kind will make the family cow an invaluable asset.

Learn to use surplus milk in nutritious and palatable ways.

Determine the possibilities of securing from the goat an adequate milk supply for a small family.

Don'ts

Don't use canned milk except as supplement to liberal, fresh supply.

Don't overlook the need of pasturage for economical milk production.

Don't supply family with milk of doubtful sanitary quality.

Don't neglect to have a veterinarian make health tests of the cow or goat.

Chapter XII

[Pg 170]

MARKETING FARM PRODUCTS

THE DISTRIBUTION of farm products on an efficient basis is one of the most difficult problems in agriculture. Because of the demand of the consumer for small quantities of products at each purchase, the breaking up of wholesale packages, involving additional labor and containers and the elimination of unfit specimens, increases handling costs and delays the arrival of the product from the farm to the consumer. In recent years the producer has sought various means of eliminating some of these costs of distribution so that he could get a larger share of the consumer's dollar, and the consumer has welcomed the opportunity of buying products direct from the producer.

Unquestionably, one of the best means of selling farm commodities is through the medium of roadside markets that have now become so common along the principal highways of the country. These range in type from the display of a few baskets of farm commodities on the ground or on a table, with sales of $100 a year or less, to those of a more pretentious nature in which buildings and equipment are erected suitable to the purpose. That there are great possibilities of developing a successful business in selling products in this manner is evidenced by some of the more elaborate markets, transacting an annual business of $30,000 or more. In most cases these have been developed from small beginnings and the facilities have increased as the good reputation of the market has spread.

[Pg 171]

Advantages of Roadside Marketing.—From the standpoint of the producer or the operator of the roadside stand, there are certain advantages that have contributed to the growth of the movement. For example, there is no expense or time involved in delivering the products to a distant market, since the produce is sold by a member of the household, or by the operator's employees in the larger types of markets. It is possible through such a market to build up a clientele of buyers who will return for further purchases. They will tell their friends about the good quality, dependable produce which they have been able to purchase at some particular stand. Furthermore, a wide variety of products can be sold in this way at one stand, which might have to be segregated and shipped to different markets if some other method of marketing were being followed. This would add considerably to the expense of selling, especially where the volume of each commodity is small. Furthermore, in such a method of selling, the producer comes in direct contact with the consumer. Ideas are exchanged, mutual confidence is developed and both should share financially in the advantages accruing from eliminating ordinary means of distribution.

[Pg 172]

Problems in Roadside Marketing.—On the other hand, there are certain disadvantages of roadside selling which operate against successful merchandising in such a manner. These should be fully considered in deciding how the surplus farm products are to be disposed of. Due to the difficulty experienced by many potential buyers in getting satisfactory produce, they have become discouraged and will often drive by all roadside markets rather than take a chance on buying commodities that may be misrepresented. Naturally, this works against the development of adequate business and makes it necessary for the individual to spend considerable time and effort in selling himself and his market to the public and in creating confidence and good will.

There is necessarily some loss due to depreciation in the quality of perishable commodities. In many cases it is necessary to expose these commodities to the sun and weather, and if they are not sold promptly they will not long maintain the standard of quality which the operator must have identified with his market. The operator has no knowledge of the number of customers he will have when he displays his products, nor does he know the whims of the individuals who may patronize his market that day. To avoid the losses resulting from unsold products it is desirable to have some other outlet which will absorb unused quantities, even though the price is not so good as would be secured from ordinary sales at the market. Many of the commodities can be delivered to some wholesale market to be sold for what they will bring. Another outlet that is available is through canning or preserving the commodities and selling them later in the season under the label carried by the roadside stand. [Pg 173]

It should be borne in mind that the business of operating a roadside market has its own peculiar problems and success in it depends upon following good merchandising principles, to which are added those finer points which pertain to direct selling. The attitude of the public must be studied and plans for promoting sales must be adopted which will result in attracting and holding customers. Beyond doubt, the two most important factors in the operation of a successful roadside market are attractiveness of the stand itself and the quality of the products that are offered for sale. [Pg 174]

Plans for a Roadside Market.—A roadside market need not be expensive to be attractive. The thought motivating the whole project should be to create in the buyer's mind a farm scene, laying emphasis upon such factors as are easily associated in the public mind with farming. These include neatness of the establishment, cleanliness and honesty in every phase of the operation. One should not undertake to run a roadside market in competition, so far as appearance goes, with the corner grocery store in the city. It should have an individuality of its own and be *of* the country as well as *in* the country.

The location of the market has a great deal to do with its attractiveness. It is well to locate it a short distance from the house, so that it stands out as a market, and it should be placed back from the highway to permit motorists to drive off the highway in making stops for purchases. In some states, highway regulations require that such stands be located far enough from the highway to permit all four wheels of a standing vehicle to be off the road surface. If the stand can be located under some good shade trees, that in itself constitutes an invitation to the sun-blinded traveler to stop and partake of the commodities offered for sale.

Larger Image

A wayside market that meets every need and attracts buyers.

So far as the design of the market itself is concerned, there are endless opportunities for one's genius to be brought into operation. It should be borne in mind that, while there are certain standard requirements in the way of display shelves and facilities for keeping reserve stocks immediately available, as well as a safe container for funds, originality in design attracts attention. Here again, the design should not be obtrusive, but one that blends with the atmosphere of the place where the stand is set up. It must convey the impression that the owner of the property is himself the operator of the stand and has transferred to the stand the same interest which is manifested in his home and its immediate surroundings. [Pg 175]

Most purchasers at roadside stands want to see the whole display without having to stumble over baskets and other articles to find out what is offered, and they expect prompt attention. As a general rule, the more nearly the stand can supply the complete needs of the purchaser in that field, the more likely are buyers to stop and become regular patrons. In addition to the display of seasonable fruits and vegetables, it is desirable to have eggs and dairy products, including butter, cottage cheese, canned fruits or jellies that have the home-made farm atmosphere about them.

In most cases, ice is available or electric refrigeration can be utilized for keeping cold milk, buttermilk, cider and other products available for immediate consumption for the hot and thirsty traveler in the summertime. Hot coffee or hot chocolate can be made available for service in colder weather. Very often the road-stand operator destroys the genuine sales appeal that such stands have by specializing in manufactured concoctions that have no relation whatever to the location where they are sold. Too often the stands are covered with advertisements of such commodities, and this immediately creates sales resistance so far as the promotion of fresh farm [Pg 176]

products is concerned.

Origin of Products Offered.—The ordinary purchaser at a roadside market likes to think that he is buying products raised or processed on the place where they are sold, and believes that he is thereby securing fresher and better commodities in which the seller has had an interest from planting time to harvest. Certainly some of the commodities sold should come directly from the tract where the market is located, and visual evidence should be given of that fact. On the other hand, there is no objection to the addition of other commodities so long as they are in accord with what a producer might be expected to have for sale at that season of the year. Many operators [Pg 177] have found that the sale of gasoline and lubricating oil and tobacco in various forms can be offered for sale to good advantage simply as a part of the service being offered by the market to the public.

Quality the Keystone.—The fundamental basis for success in the operation of any roadside market lies in the quality of the products that are offered for sale. This is a rather difficult condition for the operator to maintain consistently, but it is fundamental in securing customers and in keeping them. Products that have become stale, unattractive or unpalatable for any reason should never be offered for sale and should be discarded, made into some by-product or sold through some channel which will not identify the article with the stand itself. A satisfied customer who develops confidence in the integrity and good faith of the stand operator is a decided asset, and no effort spent in cultivating such confidence is wasted.

Every successful roadside stand operator has built his business on honest dealing and a personal interest in seeing that the buyer is satisfied. This contact between the owner of a small business and a buyer is one that can be capitalized to a very great extent. It is one of the handicaps which a chain-store organization has to face and one that must be developed by the person who wishes [Pg 178] to establish a permanent and satisfactory business in this merchandising field. Very often the sale of farm products can be supplemented to the advantage of the stand by offering small ornamental plants or by the display of pet animals, particularly for the younger members of the traveling public.

Success Factors.—A definite program of advertising can be developed with many original features that apply directly to the type of business. If the operator has pride in his products he will be glad to have his name on every package of commodities that he sells. This is good sales propaganda even if it only indicates the confidence of the seller in his products and his willingness to stand behind them. Besides that, however, it creates a knowledge of his name or the designation of his farm or stand among purchasers who will then have a means of identifying it to their friends. A small leaflet, describing the products that are offered for sale and the intention of the operator to give the customer service, can be put in each package at very small cost with good results. It is also possible to prepare leaflets dealing with methods of cooking or of preparation of the commodities sold that will build good will on the part of customers.

The most successful operators, again, are those who do not depend upon casual visitors for their [Pg 179] trade but who make of the casual visitor a regular customer and one who will speak a good word to others. In other words, genuine effort must be made to identify the location as a place to which buyers will wish to return as they do to any other place of business that gives satisfactory service. In this way the operator distinguishes himself from his fly-by-night competitors who exist during a week or two when surpluses of commodities are available at low prices and who have no thought beyond that of the immediate sale.

Wherever possible, the attention of the passing consumer should be directed to the stand before he reaches it so that he will be prepared to stop when he comes upon it. Signs of this type on either side of the stand, but some distance each way from it, are more important than is generally recognized. They constitute invitation cards and should be so worded as to excite curiosity and create a feeling in the intending purchaser’s mind that he will make no mistake in stopping to fill his wants at the stand. It goes without saying that both the advertising and the stand itself must be so planned as to attract the purchaser, and every effort should be concentrated on the psychology of such an appeal, avoiding any appearance of slouchiness, which would be more repellent than attractive. The purchaser forms a quick opinion of the stand from the way in which [Pg 180] it is conducted and from the appearance of the one who is there to make sales. An attitude of cordial cooperation on the part of the attendant, who is, of course, appropriately dressed and in the right mental attitude, is a factor that must not be overlooked in the effort to create a favorable impression.

Meal Service Amid Farm Surroundings.—Many operators, located at strategic points near main highways, have found that maximum profits are obtained by serving meals prepared from the vegetables supplemented by poultry or other products of the little farm. These meals may be served in a booth or building adjoining the roadside stand or in a room of the house turned into a seasonal dining room. Persons who are city residents quickly learn to appreciate the virtues of fresh vegetables and freshly killed poultry that may be thus served. A schedule of reasonable prices must be maintained if trade is to be built up. Usually special dinners or lunches can be prepared from available products in season, thereby giving the customer more for his money at the least cost and trouble to the operator.

This small home restaurant business can be handled frequently by members of the operator’s household and countless examples can be given of real financial success following such ventures. [Pg 181] Expansion can take place as consumer demand develops. Cleanliness, good home cooking, generous portions and prompt and courteous service will work wonders in such a project.

Tourist Guest Houses.—A large number of country homes are now open to the public as tourist guest houses, their owners finding that they can obtain a modest but worth while supplement to other forms of income from them. These tourist guest houses are largely a development of the

past several years. Their popularity with automobile travelers appears to be increasing, and there is genuine opportunity for the housewife on a small farm to operate one of these establishments.

It should be kept in mind by the housewife who thinks of opening her home to tourists that the proposition has its drawbacks as well as its advantages. Only a modest fee, often $1.00 for a room and 30 or 35 cents for breakfast, is obtained from each tourist guest. However, a great number of American women have found that the work and trouble occasioned by taking in tourists are worth while and actually enjoy their contacts with the traveling public.

The tourist guest house, obviously, should be located on a road that is well traveled by tourists. A simple and attractive "Tourists Accommodated" sign and a neat and pleasing front yard are [Pg 182] needed to interest passers-by in the place. The porch should be neat and attractive and the interior of the house should give the appearance of restfulness, simplicity and comfort.

Tourists usually inquire about prices and look over a place before deciding to stop there; if there are women in the party, one of them usually makes the inquiry. The family should be courteous in answering questions and showing the prospective customers about. They should not be indifferent, and yet must not seem to be too anxious for business. When the travelers decide to stay, the family should endeavor at once to make them feel at home. The guests will frequently ask questions about roads, local resorts and near-by recreational facilities, and the family will find it useful to be informed on these matters.

Dog Breeding as a Source of Income.—Many persons who have located in the country, and who have a liking for domestic animals, have found dog breeding an interesting and frequently profitable enterprise. By placing a wire cage along the highway the attention of the traveling public is attracted to the puppies. Some of the more popular breeds of dogs include the Airedale; the Boston, Fox and Irish Terriers; the Chow Chow; the Collie, and the English and Irish Setters.

The breeding of dogs is a highly specialized activity, particularly where it is carried on under [Pg 183] intensive conditions and with little range. Dogs are subject to external and internal parasites requiring preventive and curative measures. As in the case of all other animals, sanitation is an essential factor to success and feeding methods must be adjusted to the age and the breed.

The beginner in dog raising should consult a recognized veterinarian who specializes in small animal practice, and observe his recommendations. Such professional men are located in most communities and their advice will be found most helpful.

The prices obtainable for male and female young animals vary with the locality. There is usually an established scale of prices which may easily be obtained and which it will pay to observe. Dog shows are growing in popularity and exhibitions at these expositions will serve to advertise the breeder's stock. Advertising in local papers is effective in bringing to the public the availability of stock of distinctive breeds. Fashions in dog breeds change with the times and the public must be catered to along the lines of current interest.

Do's [Pg 184]

Use the roadside market or near-by outlets for disposing of excess farm products.

Fully utilize the possibilities of roadside stands in building a permanent business.

Road stands, as well as the products on display, must have sales appeal.

Produce at home all farm products offered for sale, if possible, and make the growing area the background of the market.

Stress quality of products and the responsibility of the operator.

Advertising of the right type will multiply sales.

Offer meal service with farm surroundings wherever possible.

If considerable traffic passes the premises, try out possibilities of accommodating tourists.

Don'ts

Don't try to dispose of miscellaneous surplus of farm commodities by shipment to market if a roadside market can be set up.

Don't ruin standing of roadside market by selling inferior or stale products.

Don't try to run a city fruit stand with a farm background.

Don't destroy country home life by over-commercialization.

SUGGESTED REFERENCE LIST

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TIMELY and valuable publications of the United States Department of Agriculture, state departments of agriculture and state agricultural colleges and experiment stations are available to country residents. Copies of them may be obtained by writing to the agencies mentioned. To supplement them and also to supplement advice received from county agricultural agents, a number of useful books are listed below. Those interested in them may, in many cases, obtain them from local libraries, or may find it useful to own certain of them themselves.

Author	Title	Year	Publisher
Agee, Alva	“First Steps in Farming”	1923	Harper
Arnold, Schuyler	“Wayside Marketing”	1929	De La Mare
Auchter, E. C., and Knapp, H. B.	“Orchard and Small Fruit Culture”	1929	Wiley
Ayres, Q. C., and Scoates, D.	“Land Drainage and Reclamation”	1928	McGraw-Hill
Bailey, L. H.	“Manual of Gardening,” Rev. ed.	1925	Macmillan
Bear, E.	“Soil Management”	1927	Wiley
	“Theory and Practice in the Use of Fertilizers”	1929	Wiley
Bottomley, M. E.	“Design of Small Properties; a Book for the Home-Owner in City and Country.”	1926	Macmillan
Bush-Brown, Mrs. Louise (Carter)	“Flowers for Every Garden”	1927	Little
Chenoweth, W. W.	“Food Preservation; a Textbook for Student, Teacher, Homemaker and Home Factory Operator”	1930	Wiley
Chupp, C.	“Manual of Vegetable Garden Diseases”	1925	Macmillan
	“Manual of Vegetable Garden Insects”	1925	Macmillan
Cline, L. E.	“Turkey Production”	1933	Orange Judd
Cox, J. F.	“Crop Production and Management”	1930	Wiley
Crosby, C. R., and Leonard, M. D.	“Manual of Vegetable Garden Insects”	1918	Macmillan
Davenport, Eugene	“The Farm”	1927	Macmillan
Foster, W. H., and Carter, D. G.	“Farm Buildings”	1928	Wiley
Fraser, Samuel	“American Fruits; Their Propagation, Cultivation, Harvesting and Distribution”	1927	Judd
Fraser, W. J.	“Dairy Farming”	1930	Wiley
Galpin, C. J.	“Rural Social Problems”	1924	Century
Gustafson, A. F.	“Handbook of Fertilizers”	1932	Orange Judd
Hottes, A. C.	“1001 Garden Questions Answered”	1930	De La Mare
Hurd, L. M.	“Practical Poultry Farming”	1931	Macmillan
Jull, M. A.	“Poultry Husbandry”	1930	McGraw-Hill
Knott, J. E.	“Vegetable Growing”	1930	Lea
Langstroth, L. L., and Dadant, Charles	“Honey Bee,” Rev. by C. P. Dadant, Ed. 23	1927	American Bee Journal
Larson, C. W., and Putney, F. S.	“Dairy Cattle Feeding and Management”	1928	Wiley
Lewis, H. R.	“Productive Poultry Husbandry”	1928	Lippincott
Lippincott, W. A.	“Poultry Production”	1927	Lea & Febiger
Millar, C. E.	“Soils and Soil Management”	1929	Webb Pub. Co.
Murray, P.	“Planning and Planting the Home Garden”	1932	Orange Judd
Pellett, F. C.	“Productive Bee-Keeping”	1923	Lippincott

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Phillips, E. F.	“Bee Keeping; a Discussion of the Honey Bee and of the Production of Honey,” Rev. ed.	1928	Macmillan
Powers, W. L., and Teeter, T. A. H.	“Land Drainage for Farmers”	1922	Wiley
Rice, J. E.	“Practical Poultry Management”	1930	Wiley
Rice, J. E., and Botsford, H. E.	“Practical Poultry Management”	1925	Wiley
Root, A. I., and Root, E. R.	“ABC and XYZ of Bee Culture”	1923	Root
Rose, M. S.	“Feeding the Family”	1928	Macmillan
Rowe, H. G.	“Starting Right With Bees”	1922	A. I. Root Co.
Sanderson, E. D.	“Insects Pests of Farm, Garden and Orchard,” Ed. 2, rev. and enl. by L. M. Peairs	1921	Wiley
Sears, F. C.	“Productive Orcharding; Modern Methods of Growing and Marketing Fruit”	1927	Lippincott
	“Productive Small Fruit Culture”	1925	Lippincott
Sharp, M. A.	“Principles of Farm Mechanics”	1930	Wiley
Smith, R. H.	“Agricultural Mechanics”	1925	Lippincott
Thompson, H. C.	“Vegetable Crops”	1931	McGraw-Hill
Thorne, C. E.	“Maintenance of Soil Fertility”	1930	Orange Judd
Watts, R. L.	“Vegetable Gardening”	1921	Orange Judd
Worthen, E. L.	“Farm Soils, Their Management and Fertilization”	1927	Wiley

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SOME FARM AND GARDEN MAGAZINES

General

American Agriculturist	New York, N. Y.
Country Gentleman	Philadelphia, Pa.
Farm Journal	Philadelphia, Pa.
New England Homestead	Springfield, Mass.
New Jersey Farm and Garden	Sea Isle City, N. J.
Pennsylvania Farmer	Pittsburgh, Pa.
Rural New Yorker	New York, N. Y.

Beekeeping

American Bee Journal	Hamilton, Ill.
American Honey Producer	Producers’ League, Fargo, N. D.
Bee-Cause	Watertown, Wis.
Gleanings in Bee Culture	Medina, Ohio

Dairying

Ayrshire Digest	Spencer, Mass.
Dairy Farmer	Des Moines, Iowa
Guernsey Breeders’ Journal	Peterboro, N. H.
Hoard’s Dairyman	Fort Atkinson, Wis.
Holstein-Friesian World	Laconia, N. Y.
Jersey Bulletin	Indianapolis, Ind.

Flower Gardening

American Home	Garden City, N. Y.
Better Homes and Gardens	Des Moines, Iowa
Flower Grower	Calcium, N. Y.
Gardener’s Chronicle of America	New York, N. Y.
Horticulture	Boston, Mass.

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Fruit Growing

American Fruit Grower	Chicago, Ill.
Better Fruit	Portland, Ore.

Livestock

Breeders' Gazette	Chicago, Ill.

Market Gardening

Market Growers' Journal	Louisville, Ky.

Poultry

American Poultry Journal	Chicago, Ill.
Everybody's Poultry Magazine	Hanover, Pa.
New England Poultryman	Boston, Mass.
Poultry Garden and Home	Dayton, Ohio
Poultry Item	Sellersville, Pa.
Poultry Success	Springfield, Ohio
Poultry Tribune	Mt. Morris, Ill.

Footnotes:

[1] Prepared by New Jersey Agricultural Experiment Station.

[2] Prepared by Michigan State College of Agriculture.

[3] Prepared by New Jersey Agricultural Experiment Station.

[4] New York State College of Agriculture, Cornell University, Ithaca, New York.

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