OPPORTUNITIES

in

KENTUCKY AGRICULTURE

Statement of Possibilities
for Better Living and
More Prosperous Farming

Circular 404

UNIVERSITY OF KENTUCKY

College of Agriculture and Home Economics
Agricultural Extension Division, Lexington

FOREWORD

The years following the war are viewed in this publication as a time of opportunity for farm people. They promise to be a time of opportunity because, on the one hand, much needs to be done, and on the other the means are available to do the things needed. Though farming will be redirected to a peacetime basis involving perhaps many changes in production, and though economic shocks undoubtedly will occur —nevertheless, if the energy and resourcefulness devoted to war are turned toward peace, much can be accomplished.

Members of the staff of the Experiment Station and Extension Division of the College of Agriculture and Home Economics of the University of Kentucky have given much consideration during the past year to the postwar opportunities for agriculture. Farm people, when they may again resume normal operations, will expect to take their part in developing their homes and businesses to fit the conditions following war. The material presented in this publication may stimulate thinking on those actions which will make for better farming, better farm homes, and permanently improved rural conditions.

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INTRODUCTION

IN KENTUCKY AGRICULTURE the great problem that has always confronted farmers will still be with us after the war—how to gain a good living from the land, to improve the general levels of family and community life, and to do these in such a manner that the fundamental resources of the land itself shall be protected and built up. Toward these ends farm families in all communities of the state have worked for years in cooperation with the Agricultural Experiment Station and Agricultural Extension Division of the University of Kentucky. Great progress has resulted, as can be witnessed on thousands of farms throughout the state. But it is also evident that only a good beginning has been made. Progress always is slow, and on countless farms many of the better practices are still unknown or have not yet been put into use. On the farms and in the farm homes where most progress has been made there is room for still greater improvement.

The means to improvement in the postwar years will be, for the most part, the same as in the past. There will of course be some new equipment, some further improvement in methods and technics, in strains of crop plants and of farm animals—but by and large the means to improvement already are known, have been extensively recommended and demonstrated by county agricultural agents and home demonstration agents, and are familiar to large numbers of farmers throughout the state.

Nevertheless, though most of the opportunities for better farming and better farm life described in the following pages are not *new* in the sense of having been previously unknown to agricultural leaders, they still point the way to the great postwar opportunity in Kentucky agriculture. This is the opportunity *to do the things that need to be done*. Probably never before, certainly not for many years, have Kentucky farm families been in so favorable a position as they will be at the war's end, to take the steps necessary toward better farming and more satisfactory farm life. Average farm indebtedness is lower than before the war; average savings are greater; labor will again be available. And certainly not the least of the assets to be thrown into the improvement program will be the attitudes of farm people themselves who have seen the way toward better things and are determined to strive for them.

It is hardly necessary to point out that in the following discussion of needs and opportunities no attempt is made to provide specific blueprints for the set-up on any given farm, nor for the farming in any one region of the state. The discussions are necessarily general. Each reader and each group must choose that which applies to the local conditions. Moreover, in calling attention to needs and opportunities, the specific farming and homemaking practices involved could not, of course, be described in detail. Detailed information on practices and methods are available from local county agricultural and home demonstration agents or in the many publications of the College of Agriculture and Home Economics and the Agricultural Experiment Station at Lexington.

A BASIC PROGRAM FOR KENTUCKY AGRICULTURE

Kentucky is primarily an agricultural state. Nearly half of her people (45 percent in 1940) live on farms. Agriculture is therefore the largest industry of the state—and farm prosperity is of paramount importance to the welfare of the state as a whole. In one way or another, perhaps 80 percent of Kentucky people look to farming or to business with farm people as their chief means of support.

Among Kentucky's farmlands there is great variation, some of the land returning only the scantiest living to those who till it and some of it supporting great agricultural wealth. Many of the farms are small; about one-third of all farms in the state have less than 10 acres well suited to cultivation. Especially in the more hilly parts of the state more people depend on the land than have been able to get a satisfactory living from it. Low average farm income, small farms, many people looking to the land for support—these are conditions that are bound to create problems calling for solution.

Those who are in close touch with Kentucky farming are aware of several outstanding needs which, if widely met, would go a long way toward improving farm incomes and family living, and raising general prosperity in the state. These may well be called the basic needs of Kentucky agriculture today. Toward the meeting of these needs Kentucky people can take the initiative—farmers themselves and others who have caught the vision of what really good farming can do for them and their communities. There are other needs in agriculture which must be dealt with nationally, even internationally; but on the following 16 basic needs Kentucky people themselves can act.

Full progress in meeting all these needs will depend on all groups in the state working together harmoniously toward the same ends.

1. Half or more of Kentucky's farms need to be changed from "poor land" farms to "good land" farms. Millions of acres are involved, and the people who live on them will fare poorly until the soil is improved and erosion controlled. On all farms there is need for maintenance of soil fertility or further improvement by the best of farming practices.

2. Average production from livestock and poultry should be much greater than at present. Though Kentucky has much good livestock, too many are of inferior grade. Better beeding, better feeding, and better care will give substantially larger return from Kentucky's livestock enterprise.

3. To meet the need for reliable water supplies on farms, thousands of farm reservoirs, wells, and cisterns will have to be constructed, and large numbers of water-supply sources now in use will have to be protected against contamination.

4. Kentucky has nearly as much forested land or land that should be in trees, as cropland. This forested land has great potential income value. It requires wise management, selective cutting, protection from fire,—and more general acceptance of the viewpoint that forests must have good care to return good income.

5. More than a third of all Kentucky farm families operate tracts of less than 30 acres with an average of less than 10 acres well suited to cultivation. Even after soil improvement, which most of these farms greatly need, the families on them will have meager living unless they engage in farm enterprises returning high per-acre income, or enlarge their holdings, or find off-the-farm employment. General agricultural progress in Kentucky depends upon the successful solution of these small-farm problems.

6. Farm rental practices and leasing arrangements that now generally prevail in Kentucky do not provide for good farming or protection of all the important interests of both the landlord and the tenant or the cropper. Tenant farming can be made more generally satisfactory for owners and renters alike through use of written leases embodying the best proven features of lease agreements and through fostering mutual understanding between owners and renters.

7. Collection, transportation, and distribution of Kentucky farm products need to be appraised with a view to preserving quality of product, improving service, and reducing costs. More recognition of variations in quality of products marketed is needed. More use of federal and state inspection and grading service and extension of market reporting would be distinct aids in the economic disposal of farm products. Cooperative marketing needs further development and cooperative purchasing has great possibilities. Marketing is an aspect of agriculture in which farm leaders and marketing agencies can contribute substantially to the welfare of rural people.

8. Farm-to-market roads as well as main highway systems must be completed in all parts of the state, in order that all farmers may transport their products at all seasons of the year.

9. There must be maintenance of credit sources which have both the capacity and the lending policies to service agricultural needs in times of adversity as well as in times of prosperity.

10. Construction and repair of farm buildings and dwellings are urgently needed throughout Kentucky for better living and greater farm efficiency for owners, tenants, croppers, and wage workers. Building and repair have not kept up with depreciation and obsolescence. A fourth of our farm homes are overcrowded, two-fifths need major repairs, and only one-tenth have convenient water supplies.

11. Three-fourths of Kentucky's farms do not now have central-station electric service, and five-sixths do not have telephones. A widespread extension of these facilities is needed, for better farm production and more satisfactory living conditions.

12. One of the most pressing needs of Kentucky farm and rural life is a higher level of education. This will require more school revenue to provide better school facilities, and more active interest and determination on the part of parents to see that children attend school and take full advantage of the educational opportunities open to them.

13. Development of methods and facilities by which people in rural communities can have adequate medical attention is urgent. Good doctors, dentists, and nurses, local clinics and hospitals, and health insurance will be needed to foster and protect health in rural communities. Better nutrition, better housing, better clothing, pure water, recreational facilities are among other needs to be met in assuring rural health. This is important to the whole nation, for the population of cities is constantly replenished by youth from the farms.

14. Continuous development of leadership in all communities, and wider interest in and more active support of organizations for farm and home, are necessary to full agricultural progress in Kentucky. Leadership and organizational development are needed in all group activities that affect farm people.

15. Appropriate state legislation, both enabling and regulatory, will continue to be needed in order that agricultural development in keeping with the best interests of all the people may proceed along the soundest lines. Such legislation will promote the best interests of agriculture if it results from enlightened consideration of state problems by all major groups within the state, working together harmoniously and understandingly.

16. Basic to progress is continuous scientific research into all problems affecting agriculture, and adequate means of bringing to the attention of the people the results of such research.

LAND

By far the most important problem before Kentucky farmers is to build up and keep up the fertility of their soil. That will do more to bring prosperity to Kentucky than any other one thing the farm people themselves can bring about. It is the greatest opportunity they now have, and is basic to practically all other improvements in farming and farm life. Improving the soil that needs improving, throughout the state, to the level of fertility possible and practical, could well increase the average farm income by 30 to 40 percent. On many of the least productive farms the acre-yields and the returns from livestock could be multiplied several fold. The methods are within reach of farmers in all sections of the state, and have already been put into practice by many of them on both small and large farms. For the best interest of the families, communities, state, and nation, at least half of all the farms in Kentucky require immediate steps to build up their soil. And on most of the other half, further improvements in soil fertility could profitably be made.

Building up of better farms on such wide scale would be the work of a period of years, requiring a great deal of forethought, knowledge, hard work, and not a little capital. But the goal is worth the effort. And, farm by farm, it is something that the families themselves can do.

Crops and practices need to be better adjusted to the land

Each farmer needs to work out his own program for best use of his land so as to improve and maintain the soil and at the same time get a satisfactory living from it. The program, for good results, must fit the characteristics of the land, size of farm, nature of markets, amount and kind of labor available, and the abilities of the farmer. On most farms some of the fences will need to be moved so as to follow the natural adaptations of the land and permit contour farming. Over the state as a whole this would require the moving of about one-third of Kentucky's farm fences, but on most farms less fence would then be needed than is now in use.

On small farms it is often more difficult than on larger farms to work out a practical farming system in which the cropping is well adjusted to the land. The reason is that it is usually necessary to farm more intensively on the small farms, in order to gain a satisfactory living. Nevertheless, on most small farms there is opportunity for some improvement in adjusting the crops to the land, and for much improvement in conserving the soil and building it up. By most careful attention to the details of soil improvement and conservation,

farming practices and choice of enterprises, most families on small farms can improve their land and at the same time reap a better reward from it.

Improvement of several million acres, in total, of idle land or of unproductive land now in farms offers one of the major opportunities for bringing about better use of land in Kentucky. Some of this land might be planted to desirable species of trees and managed as farm woodland. Much of it, however, could be prepared and planted to perennial grasses and legumes for pasture. In either case, areas now largely waste would become valuable farm land. Considerable equipment and labor will be needed in improving this land.

Much greater addition of plant foods is urgent

If Kentucky farmers on a wide scale take full advantage of the possibilities for improving their farmland there will be a very large increase in amount of fertilizing and liming materials used in the state. This in turn will mean a considerable increase in volume of business and employment for those who manufacture, sell, and distribute the fertilizing and liming materials and equipment.

It is estimated that about 3 million acres of Kentucky cropland have had a basic application of liming materials and 2 million acres more do not need liming. The remaining 8 million acres suited to crops would therefore require 16 million tons of ground limestone for a basic application of 2 tons per acre. Thereafter, about 1 ton per acre would be needed every 8 to 10 years, or about 1.5 million tons a year. In 1942 some 1,316,000 tons of limestone were used on Kentucky farms. It is evident that to quarry, crush, and spread the amount of limestone needed offers a postwar opportunity for local groups of farmers, county agricultural associations, or private enterprise.

About 340,000 tons of fertilizer materials, a large part of which was 20-percent superphosphate, were used in the state in 1942. For full use of the land, about 1.2 million tons would be needed annually. Such materials would contain about 40,000 tons of nitrogen, 155,000 tons of phosphoric acid (P_2O_5), and 90,000 tons of potash (K_2O). This would mean that about 3 times as much phosphorus as is now used would then be used, about 15 times as much nitrogen and about 20 times as much potash. The manufacture, transportation, and distribution of this additional fertilizer to Kentucky farmers is in itself an important postwar opportunity.

Toward the supplying of needed nitrogen in the soil there will likewise be an opportunity for more business, especially if wartime developments in the manufacture of nitrogen salts result in appreciably lower prices for fertilizer nitrogen.

Growing more grass and legumes and more winter cover crops,

and keeping the livestock to make good use of the forage produced, would mean, on many farms, more manure and more crop residues for soil building. Most Kentucky farmers have the opportunity to improve their farming by better use of manure and crop residues. Poor care and use of these materials has resulted in enormous loss of soil fertility in Kentucky.

Better control of erosion and leaching needed on 3 acres out of 4

It is estimated that on nearly 46 percent of Kentucky's land more than three-fourths of the original topsoil has been lost and some subsoil has been washed away. On 28 percent more, erosion has removed from one-fourth to three-fourths of the original topsoil. Stopping this loss is of utmost importance to Kentucky agriculture. Each farmer needs, in dealing with the problem on his own farm, to consider all the soil-improving, soil-saving, and cropping practices, and their effects on each other, in order to work out a well-balanced soil-conservation program.

To keep close-growing crops on the land throughout as much of the year as possible is one of the chief means of saving soil and fertility. About 2½ million acres of Kentucky land used for row crops and such other crops as soybeans and cowpeas which leave the land bare, are left through the winter without cover. Another 3 million acres of lespedeza sod is left bare through the winter. On all of this land small grain or other close-growing crops is needed for winter cover and pasture. On the hill land legume-grass permanent pastures and meadows are generally best adapted. Much of this hill land must be treated with ground limestone and fertilizer before it will grow a stand good enough to protect the land and return a profit. More and better forage would aid soil-building in another important way also, for it would reduce the grain requirements for livestock and thus permit a lower proportion of the land to be plowed for corn.

Experience has shown that contour cultivation of land rather than straight-row farming helps to slow the run-off of water. It thereby reduces erosion and causes more of the water to soak into the soil, saving it for growing crops. About 84 percent of Kentucky's tillable cropland has more than a 3-percent slope (3 feet of fall per 100 feet) which is an approximate dividing line between land which needs some special practices for protection against erosion and that which does not. Thus far, except on our steepest cultivated land, very little land in Kentucky is cultivated on the contour. On many farms, for contour cultivation to be practical, field layout must be changed, fences relocated, and cropping systems altered.

The use of terraces, along with contour tillage, aids in saving

needed moisture as well as in carrying off excess rainfall without undue loss of soil by erosion. Because more water is saved from running off, yields per acre on terraced fields have been 10 or 12 percent higher than on similar unterraced fields. About half of our tillable land has from 3-percent to 12-percent slope, and about half of this, or over 3 million acres, needs terracing for adequate soil conservation. It is estimated that less than 5 percent of the land that needs terracing has been terraced. Hillside or diversion ditches are needed on another 2 million acres to carry water off gradually and reduce erosion.

Laying out terraces requires trained men. Power equipment is most efficient and is almost a necessity for making effective terraces. At a cost of $3 or $4 per acre the postwar terracing work needed in Kentucky would involve the expenditure of 10 to 12 million dollars if done by custom or contract. Cooperative associations for purchasing and operating terracing machinery may be an effective way of getting the job done where other facilities are not available.

Drainage work would improve half a million acres

Many stream channels have become so badly silted as a result of soil erosion and neglect that crop production on thousands of acres of once fertile land has been impaired, or even made impossible. If bank and channel work could be done within the next few years and properly maintained, there would be need for fewer expensive dredging operations in the future. Surface drainage with heavy ditching equipment is now needed on some bottomlands. Tile drainage also is needed in many parts of Kentucky but especially in the eastern half of the state. Proper draining, fertilizing, and cropping of these areas offers a real opportunity for producing high yields of row crops and reducing the use of steep land for such crops. Manufacture of tile and installation of drainage systems on some half a million acres of land in Kentucky are definite postwar needs.

Water supply for livestock affects soil management

Unless there is adequate water for livestock on pasture it is practically impossible to make full use of cropping systems involving cover crops and rotation pastures. Well-located and properly constructed reservoirs can be an important factor in bringing about better management of the soil on Kentucky farms. See pages 19-20.

Some land now farmed should be reforested

Throughout Kentucky there is farm land which, on account of its topography, soil type, or degree of erosion, could be more economically used for forest than for other farm crops. Such land should be reforested and managed so as to produce forest products continuously and efficiently. See pages 31-36.

CROP PRODUCTION

Kentucky's postwar opportunities in crop production lie, for the most part, in better practices which will result in larger and more economical yields per acre, rather than in a shift to new or different kinds of crops. Perhaps a few farmers can take advantage of special opportunities in the growing of such crops as sage, aromatic seeds, and so on, but most farmers no doubt will continue to build their farm operations around tobacco, corn, hay and pasture, and livestock. Limited opportunities lie in enlarged production of hybrid seed corn and other seed crops and in the growing of a few specialty crops such as fruits and vegetables in some areas.

Better balancing of crop enterprises with each other, with livestock enterprises, with the kind of land and size of farm, the labor available, the inclinations of the family, and market needs and outlets, offers an opportunity for better farming on many farms. This balancing of farm enterprises is a crucial matter in good farming. It requires careful planning and good judgment. It is purely an individual matter on each farm. Some farmers will need to reduce their acreages of certain crops; others may find it advantageous to expand acreages of these same crops. Over the state as a whole such changes should add up to somewhat less total acreage in corn, much more in small grains for winter cover and pasture, and much more in legume-grass mixtures on improved soil for hay and pasture.

Needed feed grain could be grown on fewer acres

Corn is by far the most important grain crop in Kentucky, usually about 80 million bushels a year; but for best use of land the present total corn acreage in the state (about 2.8 million acres) is too large. The need is not for less grain, but for growing as much on fewer acres, by increasing the average corn yield to at least 40 bushels per acre. The average yield now is low, as compared with yields in other corn-growing states. Only once (1942) has the state's average acre-yield reached 30 bushels. Higher yields per acre will come with improved soil, limiting corn to the level lands and rolling lands on which erosion can be controlled, use of better hybrids, and following of good cultural practices.

With cropping systems generally built around livestock and tobacco, the place for small grain in Kentucky is primarily for fall,

winter, and early spring pasture and for winter cover crops. Some 5½ million acres more of small grain than at present is needed for these purposes. For winter cover and pasture in fall, winter, and spring Balbo rye seems to be most widely adapted of all the small grains, and to have the widest range in seeding dates. Wheat seeded early on good land protects the soil and furnishes grazing in early spring. Barley deserves greater use in Kentucky as a feed grain. Well adapted winter barley seeded early in September on well-drained fertile soil furnishes grazing in both fall and early spring. Improvement of cold resistance in varieties of winter oats will, if attained, bring greater interest in that crop.

The extent to which soybeans will be grown for grain in Kentucky will be determined chiefly by the relative acre-income as compared with corn. Soybeans are primarily adapted to the level bottomlands where they can be used in a rotation with corn and where power machinery is available. They should not be grown on land where erosion is a problem.

High-quality hay and pasture are greatest crop opportunity

Widespread adoption of soil-building practices and adapting of crops to land would mean greater acreage of pasture and meadowland and much improvement also in yields and quality of forage. High-quality pasture is the most economical feed for all kinds of livestock, but too many Kentucky pastures provide neither abundant nor high-quality nourishment. Good pastures are the result of proper soil treatment, the use of adapted grass-and-legume mixtures, and other sound management practices. Similarly, far too much Kentucky hay is very poor-quality feed. Improvement of hay land, growing of better kinds of hay crops, and use of improved practices in haymaking offer vast opportunities to Kentucky farmers. Use of grass silage, loft hay driers, better curing methods, and modern machinery offer means for great improvement in quality of harvested roughage.

Alfalfa is Kentucky's most profitable hay crop, and far greater acreage of it is needed. It grows well in all parts of the state, with proper soil treatment. It is now being used successfully for silage, and its resistance to drouth makes it valuable for emergency pasture. The seeding of grasses with alfalfa provides an excellent way of establishing high-quality sod. New high-yielding strains of red clover, resistant to diseases, promise greater use of this crop, especially in short rotations. Lespedeza, because of its dependability and low cost of seeding, should continue to make up a part of all seeding mixtures for meadow or pasture.

New strains of various hay and pasture plants are being developed and others, new to this area, are being tried in Kentucky. Some of these plants may have an important place in Kentucky agriculture when their adaptations have been more fully determined.

Several million acres of land in Kentucky, now largely wasteland, can be cleared of bushes, disked or plowed, fertilized, seeded to suitable grasses and legumes, and thus developed into profitable pasture. The original cost of such preparation of wasteland may seem high, but when divided by the number of years of good yields, the annual cost is low. At the Western Kentucky Substation at Princeton the gains made by steers during the first 90 days of grazing, the first season, at the market price of grass-fed beef, were enough to pay the cost of treating the wasteland pasture. For 12 years thereafter the average costs of producing beef on two improved pastures were 3.1 cents and 3.2 cents a pound; while on an adjoining unimproved pasture it was 10.5 cents a pound. Moreover, the improved pasture produced nearly four times as much beef per acre as the untreated field.

It should be remembered that grasslands, properly managed, represent an ever-increasing reservoir of fertility which may be used in times of national or personal need. As previously stated, large acreage of high-producing permanent pasture is one of the postwar objectives of Kentucky agriculture.

Better tobacco, higher acre-yields, produced cheaper

Tobacco probably will continue to be Kentucky's chief cash crop because of its high returns per acre and the fact that it fits well into cropping systems on small farms. It can be grown in a short rotation, or even continuously, on the level or slightly rolling areas, leaving the steeper areas for hay or pasture. If the postwar objectives of better income for small Kentucky farms is to be attained, farm operators must carry on enterprises which offer large returns per acre. Tobacco growing is such an enterprise.

Recent advancements in production practices make possible further improvement in average yield and quality of tobacco. More general use of adequate fertilization, green-manure crops, higher-yielding and disease-resistant varieties, and priming of burley to save all the leaves, will make possible substantial increase in average yields, and far higher individual yields than are common on many farms today. Quality of burley can be improved by more general use of better curing methods, including control of ventilation and use of artificial heat.

The Agricultural Experiment Station is continuing work on high-yielding disease-resistant varieties of all Kentucky types of tobacco and is investigating the possibilities of producing types of burley which may have advantages in added aroma and mildness. These investigations could result in greater use of Kentucky types of tobacco and in increased yield and quality of the crop as a whole because of the more general elimination of losses from diseases such as mosaic, root rots, and fusarium wilt. An operator of a small farm who does much of his own work can quickly turn these new methods of tobacco growing into cash income.

Producers of the dark types of tobacco have faced declining markets for their product. Unless new uses for this tobacco should bring profitable new outlets for it, the growers of dark tobacco probably will have to make still further substitutions of other cash crops, and continue to adjust their farming systems toward a livestock system of farming.

More adapted seed of right kinds needed

Except alfalfa seed, which will probably continue to be produced more economically elsewhere, much more good seed of the kinds needed in Kentucky could well be produced by Kentucky farmers. Often there is not enough seed of adapted varieties to meet Kentucky needs for meadows, pastures, and cover crops. Greatly increased seedings of these crops as soil improvement and protection measures would of course still further increase the need for seed.

Orchard-grass seed, bluegrass seed, and lespedeza seed are now produced extensively in Kentucky, and seed of red and crimson clover, redtop, timothy, and vetch are produced in smaller quantities. Production of crimson clover seed could well become better established in the cropping systems of the Pennyroyal area, orchard grass seed in the Outer Bluegrass and Pennyroyal areas, and hairy-vetch seed in the eastern Pennyroyal and Knobs areas. Much more seed of adapted red clover is needed. More vetch would be sown for cover crop if more seed were produced within the state. Present studies on adapted strains of red clover and new varieties of other legumes and grasses may lead to other opportunities for seed production.

Production of hybrid seed corn is a specialized enterprise requiring considerable skill, experience, equipment, and labor. For farmers who can meet these requirements, the production of hybrid corn seed will continue to be a profitable enterprise. Planting practically the entire Kentucky acreage of corn to hybrids (a worthy objective) would require great expansion in acreage of hybrid corn grown for seed.

All the small-grain seed needed in Kentucky could well be furnished by local producers.

Expansion in use of Balbo rye illustrates the possibilities which the production of seed may offer. This crop with its excellent qualities was made available because Kentucky farmers themselves became seed producers. The production of seed has not only been profitable to the growers but has contributed to the welfare of the state in protecting soil and affording fall, winter, and spring pastures. Similar opportunities exist in the production of other seed. Much more seed of Balbo rye will be needed if this crop is fully utilized for winter pasture—a total of some 200,000 acres for seed.

Sweetpotato acreage may be expanded

Sweetpotatoes and Irish potatoes are the only root crops of commercial importance in Kentucky. More sweetpotatoes could well be grown in a few areas, particularly in the extreme western part of the state, if proper market facilities were developed. Here the farms are small with sufficient family labor and the land is suitable for high quality and good yields. Should the dehydration of sweetpotatoes prove to be an extensive postwar development, other areas might be opened.

Acre-yields of Irish potatoes in Kentucky are too low for successful competition with northern potato-producing states except as a seasonal crop of early potatoes. Production of Irish potatoes for home use, and for local markets, however, could be increased on many farms. Better seed and improved cultural and fertilizer practices offer a greater opportunity in this respect than does an expansion of acreage.

Need for more fruit production

Kentucky is now dependent on other states for a large part of the fruit consumed, but more fruit is needed for better living and improvement of health. Some expansion in Kentucky fruit production can be expected. Orcharding has become well established in some areas of the state, and these areas possess geographic advantages in fruit growing that offer opportunity in the postwar period.

Large areas of Kentucky are adapted to strawberry growing—especially on the small farms with plenty of family labor. Better varieties, better control of insects, and improved cultural practices, especially mulching, give promise of higher average yields of strawberries. Improved cultural practices involving greater use of fertilizer on other small fruits offer opportunities for higher yields per acre and greater net returns per hour of labor. New developments in

freezing, refrigeration, and transportation should make possible more stable and more extensive markets than existed before the war.

Kentucky holds a favored location for production of early apples, insofar as competition is concerned. The high acre-yield and regular production of peaches in adapted areas of Kentucky, and the opportunity to reach consumers quickly with tree-ripened, high-quality fruit, over a wider territory than ever before, set the stage for a sound expansion in the growing of peaches. Better insecticides and fungicides and new types of spraying and dusting machinery promise better control of insects and diseases.

It should be emphasized, however, that success in orcharding, to a greater degree than with most other crops, depends on personal experience and ability. Experienced growers in established areas may well contemplate substantial plantings, but those inexperienced should proceed with caution on account of the complicated and highly specialized nature of the fruit business.

Better quality of vegetables

Commercial vegetable production will continue to be located around the larger population centers. The emphasis would seem to be toward better quality of product rather than increased volume. The demand for better-quality products should step up as a result of expected improvement in facilities for transportation and storage. There is prospect for expansion of freezing preservation of vegetables, both commercially and in home outfits.

The need for vegetables in rural areas may be even greater after the war than at present, and many more of the vegetables needed could be produced on the farms where they are to be consumed.

LIVESTOCK

Kentucky farmers in general have the opportunity to make outstanding improvement in their livestock enterprises. They have the chance (1) to take full advantage of high-quality and low-cost feed by producing more and better pasture forage and harvested roughage, (2) to improve feeding and management practices so as to get better results from the feed and labor used, (3) to provide clean and abundant water for the livestock and for taking good care of the livestock products, (4) to breed better livestock for more efficient production, and (5) to reduce to a practical minimum the losses from disease and parasites.

Much of Kentucky's pasture acreage is so low in productivity that it now offers little chance for profit, but it can be improved (see pages 15-16) so as to become one of the chief sources of profit in livestock production. Quality of harvested roughage also can be greatly improved (see page 15). Use of better sires along with careful selection will mean faster and less costly gains, more eggs per hen, more milk per cow, and a more desirable market product—provided that the livestock get good management as well as better breeding. Proper supplementation with needed protein, minerals, and vitamins will, on many farms, bring great improvement in feed utilization, and therefore more profitable production. On many farms also, the livestock must be fed more adequately before even reasonably good results can be had.

WATER SUPPLY

Healthy stock must have plenty of clean water

Providing their livestock a reliable supply of water, conveniently located and adequately protected against contamination with animal excretions, is one of the first steps many Kentucky farmers need to take as a basis for more profitable livestock production. Those who depend on shallow wells, springs, creeks, cisterns, and small shallow ponds often have to haul water or sell off their stock during drouths of only a few week's duration. For instance, according to data furnished by county agents in 60 Kentucky counties, 6,300 farmers in 1943 sold livestock not ready for market because of lack of water, 9,665 farmers moved or drove livestock to water, and 13,174 hauled water from an average distance of 4 miles.

In many parts of Kentucky where good wells cannot be obtained (see pages 46-47) the best insurance of having water for livestock is to provide large farm reservoirs located, designed, and constructed according to the recommendations given in Extension Circular 317, "Earth Dams for Farm Reservoirs," published by the College of Agriculture and Home Economics. The need for rotation pasture should be considered in locating the reservoir, and fields may need to be rearranged somewhat in order to provide a satisfactory supply of water for the livestock.

If reservoirs are to be a help toward profitable production, however, and not a menace to the health of the animals, the reservoir must be fenced off so as to keep the stock well away from it above the dam, and the water must be led by pipe to a watertrough below the dam. By all means barnlots, feedlots, paddocks, and other heavily stocked areas should not drain into the reservoir. Too many farm reservoirs in Kentucky do not now have these health-protecting features. To provide them will be an important opportunity for more profitable livestock production.

The construction of reservoirs requires equipment that can move earth efficiently and quickly in fairly close quarters at a reasonable cost, operated by trained men who understand how to handle the equipment and the problems involved in locating, designing, and constructing reservoirs that will be adequate and will not leak.

Thousands of such reservoirs are urgently needed for Kentucky livestock, especially in the areas of the state underlain by limestone, where it is difficult to get reliable wells. When tractors and excavating equipment again are available, skilled workmen with some capital might develop extensive custom business in building farm reservoirs. Equipment no longer needed by the armed forces may be available for such use after the war.

DISEASES AND PARASITES

Prevention rather than cure is key to disease control

Disease and parasites take a large toll from Kentucky livestock, much of which could be prevented through education, legislation, and adequate veterinary services. Modern veterinary medicine emphasizes maintaining animal health rather than selling animal cures. The best prescriptions are written in terms of disease prevention, proper management, and adequate feeding. Vaccination of pigs against hog cholera, calves against blackleg, and poultry against fowl pox is highly

recommended. The serum-culture method of vaccination for swine erysipelas and calfhood vaccination for Bang's disease should be used only under certain conditions and with proper supervision. The sale of biologics containing live or attenuated bacteria or virus should be more closely regulated.

Farmers can prevent the spread of most diseases by keeping the feed and water from becoming contaminated with animal excretions. Is is especially important to protect young animals and baby chicks from such filth, and to provide clean housing on clean ground for baby chicks and little pigs. Many Kentucky farmers eventually could practice some form of "animal rotation" as a disease-prevention measure, just as they now practice crop rotation. On most farms other steps of the swine sanitation program will prove ineffective until clean water can be supplied to the hogs. Few farmers realize that Bang's disease is very easily transmitted from infected hogs to cattle. Contaminated drinking water is one of the most common ways for such infection to be spread. By all means barn lots, feedlots, paddocks, and other heavily stocked areas should not drain into the farm reservoir, and the reservoir itself should be so fenced that animals cannot get into the water to contaminate it.

More rigid supervision and more trained veterinarians needed

Public stockyards, community sales yards and pens, and commercial stock trucks are usually contaminated with many animal diseases and parasites. More rigid health supervision of livestock shipments both within the state and to and from other states would end in preventing the spread of disease. Trucks hauling dead stock to rendering works should be leak-proof and covered. Contaminated trucks or visitors from diseased flocks or herds often are the means of infecting healthy stock. When purchased animals are to be added to herds or flocks precautions can be taken by quarantining them for at least 10 days and making every effort during that time to eliminate or cure diseased animals, to treat those that are parasitized, and to give any other treatment that is needed.

In order that farmers in all communities may obtain skilled veterinary service, more trained veterinarians will be needed in Kentucky. Also, in order that all sections of the state shall be able to attract good veterinarians many more of the farmers in some sections will need to develop a better appreciation of the economy in using skilled veterinary service.

DAIRYING

Opportunity for dairy development in Kentucky

During recent war years there has occurred a national increase in milk production of about 2 percent and a Kentucky increase of about 10 percent. It seems desirable that this upward trend in Kentucky be continued. For one reason, milk cows make excellent use of high-quality pasture and hay, especially alfalfa, and in this way fit into a program of soil improvement. For another, dairying is especially well adapted to small farms, so numerous in the state. On these farms there is usually plenty of labor to take care of the cows, and roughage can be grown to feed them; tobacco acreage is small, and some other fairly intensive type of enterprise is needed to bring in enough cash income for satisfactory family living. Kentucky farmers have some advantage in low-cost production of milk, because of plentiful labor, the possibility of good pastures, and opportunity for winter grazing; and they can compete successfully with other more firmly established dairy sections of the country, if the small herds which produce the bulk of milk and cream for sale operate efficiently.

Kentucky's possibilities as a dairy state suggest an opportunity for much further expansion of the condensery, powdered milk, and cheese-making business in the state. Such expansion would make it possible for many more farmers than at present to sell whole milk, with its price based on its total solids rather than merely on the amount of butterfat it contains.

Family Cows: Better feeding and management

About one-third of Kentucky's milk cows, on about half of the farms, are kept chiefly to furnish milk, butter, and cheese for the family. In areas where feed is scarce and expensive, where this kind of dairying predominates, there seems to be little justification for producing milk or cream to ship out of the community.

There is room for much improvement, however, in feeding and managing family milk cows—in total economic importance to Kentucky farm people this opportunity is much greater than would appear at first thought. The growing of enough good-quality feed is one of the chief opportunities for improvement. Much can be done toward better use of milk in the farm home by clean, careful methods of production; by making farm butter, cottage cheese, and hard cheese; and by developing a better appreciation of the food value of these dairy products, including skimmilk. Better cows, more suitable for family cows, are needed; and to bring this improvement about sires

of dairy or dual purpose breeding must be so placed as to be available to the farmers who have cows.

Small Herds: Lower costs, improved marketing, and better replacements

Some 50,000 Kentucky farms widely distributed over the state, have milking herds of 3 to 10 cows each. These herds produce the bulk of the cream and much of the milk sold in Kentucky to creameries, cheese factories, and condenseries.

Greater efficiency in production and marketing is the important postwar objective for these small-herd owners. More and better home-grown feed is the first means to this end—through improved summer pastures, more use of small-grain pasture in fall, winter, and spring, more alfalfa, higher yields of corn, and careful use of farm manures. Along with more and better feed goes better management in feeding economical balanced rations which utilize and adequately supplement the home-grown feeds. Plenty of clean water throughout the year, at the places where the cows can get it easily, is just as important as plenty of feed.

To produce high-quality products with which to command a premium price, small-herd owners need cheap electric power and plenty of water for cooling, and suitable but inexpensive barns in which to milk.

Improving herds through constructive breeding is an essential part of a program for greater efficiency in production. Too many farmers in Kentucky are milking cows sired by beef or nondescript bulls. Such cows cannot compete successfully with cows bred for milk production. The general practice of buying female replacements is not economical and it also has the danger of bringing disease into healthy herds.

On many small Kentucky farms, veal production is an important source of income. Owners of milking herds who wish to sell male calves as veal, and to raise heifers for replacement purposes with some assurance that they will become good milk cows, are advised to use carefully chosen Brown Swiss or Milking Shorthorn sires. Otherwise a sire of either more strictly dairy or beef breeding is recommended, depending on the owner's wishes in future herd development.

Commercial Herds: More production records and herd classification

There are now about 5,000 herds of milk cows in Kentucky on farms where half or more of the gross farm income is from sale of dairy

products. These herds are widely distributed over the state, and include a considerable number of herds bred for sale of seed stock. For these herds the goals of greater efficiency in production and marketing described in the preceding paragraph, and the means of reaching them, apply the same as for the smaller herds. In addition, they will need rigid culling to the number of cows per herd which can be maintained most efficiently and profitably. Wider use of production records and herd classification programs in the better herds as guides for selection and breeding of seed stock sires, also are needed. Owners of good registered herds might take the lead by adopting the many new approved practices which are a part of better dairying.

Artificial insemination promises better breeding

Artificial insemination, now being practiced in some herds, gives promise of being a very important postwar development in dairy-cattle breeding in Kentucky. It offers a means by which small-herd owners may have the use of the very best sires, plus valuable breeding-program guidance, at a reasonable cost. It also offers an opportunity for the wide distribution of superior germ plasm, which will effectively improve herds.

POULTRY

Although much of the feed for poultry production in Kentucky must be purchased, labor is plentiful on many Kentucky farms, especially on the smaller or less productive farms and an efficient poultry enterprise is a good way to use it. Another advantage for poultry production in Kentucky is that it is possible to produce green pasture throughout most of the year, and thus to reduce the total amount of grain and protein concentrates necessary.

More efficient production and better marketing are chief opportunities

The main postwar opportunities in poultry raising in Kentucky lie in more efficient production; healthy, productive poultry on every farm; and the development of marketing facilities for eggs and poultry meat that will recognize quality in the product produced and will provide adequately for the marketing of small as well as large quantities of eggs and poultry per farm. More efficient production can be brought about generally by better housing, use of time-saving equipment, feeding of balanced rations including grain and mash in separate hoppers, and more attention to preventing disease. Particular stress should be placed on adequate floor space and on feeding and watering equipment to care for the pullets housed.

Healthy productive poultry and fewer losses from poultry diseases may be obtained in a great measure by steady progress of the hatchery industry, adhering strictly to the standards of breeding and pullorum disease control that have been set up in the National Poultry Improvement Plan. Kentucky has cooperated in this plan since 1935 and progress has been notable. In addition to furnishing to Kentucky farmers chicks of high production quality and with a very small amount of pullorum disease, there has developed an excellent out-of-state market for hatching eggs and baby chicks, especially in the southern states. Every effort should be made to retain and further develop this market.

Some readjustment in size of flocks needed

There will be need for some readjustment in the size of poultry flocks in Kentucky. Commercial egg production on a large scale is generally practical only where there are special markets for eggs, or ample supplies of feed grain in the area, or where labor is abundant in proportion to the land available for farming. It would seem advisable that more chickens be kept in thickly populated eastern Kentucky, where labor is abundant and an excellent local market normally prevails for poultry and eggs. It would also seem advisable that more poultry be kept in other sections of the state where labor is abundant and feed can be obtained readily. On the other hand, many farmers in areas where feed is scarce and labor costs are high probably will find it most profitable to reduce the size of their flocks. For home use, enough chickens should be kept to supply at least one egg per day for each member of the family.

HOGS

Scarcity of grain limits hog raising in Kentucky

Increased efficiency in hog production rather than more hogs is the postwar goal for Kentucky as a whole. Profitable hog production calls for more grain than in most livestock enterprises, and in much of Kentucky grain is relatively scarce. In those areas hog production will in general be profitable only when confined to production of pork for home use. Hogs as a sideline can use many waste products on the farm and furnish meat for the family. Other areas of Kentucky, notably the lower Ohio Valley, Pennyroyal, and Purchase areas, usually produce a surplus of grain, and those are the areas to which commercial hog production is best adapted. In Central Kentucky hog production fluctuates with available supplies of feed. Normally more pigs are raised than can be fed to maturity. Surplus pigs are sold as feeder pigs to commercial hog-producing areas or for the pro-

duction of cholera serum. These practices probably will continue to be practicable. Cheap supplies of distillery slop, properly balanced and fed to healthy hogs, offer a practical and profitable source of income to producers in some areas.

Big opportunity in better methods

Hog production, whether for home use or for market, to be most profitable, must make effective use of swine sanitation, adequate year-round pasture, balanced rations, improved breeding, and skillful management. Kentucky farmers by adopting this program can, on the average, market 2 more pigs per litter at 8 weeks younger age and 20 pounds heavier average market weight, than has been common.

Few farmers appreciate the importance of good pastures in hog production. Such pastures can save up to 15 percent of the grain and 50 percent of the protein supplement while contributing greatly to practical and effective swine sanitation. Kentucky needs better pastures, especially of legumes, small grains, or mixed grasses. Hogs can make profitable use of their share of such pastures.

Individual farrowing houses also contribute to efficient hog production by making it easier to follow good practices. Tilted farrowing floors with a "pig hover" along the lower wall, for example, reduce losses of young pigs by crushing, from 1 out of 5 to about 1 out of 50.

Hogs of poor type, not bred for rapid and efficient gains, would limit the profit of even the most intelligent and industrious pork producer. Therefore carefully selected purebred sires of good type, performance, and prepotency should be used in all matings. In order that there may be enough of such sires there will be need for more good purebred herds in Kentucky.

SHEEP

Sheep raising goes well with soil improvement

Sheep raising fits into a soil-building program in Kentucky, especially in the use of winter cover crops, perhaps better than any other livestock enterprise. In the bluegrass area commercial sheep production has become a stable enterprise that has seldom failed to return a reasonable profit to the average producer. After the war, flocks in the bluegrass area will probably be built up to prewar numbers; and the sheep enterprise could well be expanded substantially in other parts of the state provided it is accompanied by adequate use of winter cover crops, a sound pasture improvement program, and the production of more and better harvested roughages. To provide for the sheep, more fences would be needed on many farms.

In recent years sheep raising in Kentucky has been hampered by trouble with internal parasites, sheep-killing dogs, unfavorable relationship between cost of production and controlled market prices, and short supplies of roughage due to unfavorable growing conditions. The discovery and use of phenothiazine bids fair to solve many of the sheep parasite problems and to add impetus to a postwar expansion of sheep growing. County sheep protective associations have reduced the risk from dogs both through the insurance plan which reimburses farmers for much of their loss from sheep killed by dogs, and by county-wide cooperation for control or elimination of sheep-killing dogs. More of these associations and a wider participation in their programs are postwar opportunities.

More good purebred flocks needed

Kentucky's spring lamb enterprise has always called for the use of good-type purebred mutton rams. A large percentage of Kentucky spring lambs are sired by such rams, and demand for these commercial rams has resulted in the building of many excellent flocks of purebred mutton sheep. An expansion in numbers and a steady improvement of quality of these purebred flocks in line with the expansion of commercial sheep production will be needed.

BEEF CATTLE

Fuller use of pasture and hay essential

No great expansion from prewar numbers of beef cattle in Kentucky would seem to be practical after the war. Certain adjustments will be needed, however, to make beef-cattle raising more profitable and stable, because some of the beef-production enterprises common in Kentucky are not especially practical in most areas of the state. With the exception of a few scattered seasons the marketing of extremely heavy cattle finished either on grass or in drylot has been a risky and unprofitable venture. The production of any beef through long periods of drylot feeding has proved to be equally risky and unprofitable, except in a few areas of the state where more corn is raised than is fed locally. In other areas of Kentucky the price of corn is usually 10 to 15 cents a bushel higher than its price throughout the corn belt, and this puts drylot feeders in these areas at a disadvantage.

The best future for Kentucky's beef cattle industry lies in its making most efficient use of pasture and hay. There is plenty of evidence that good beef can be produced in a well-planned enterprise using either home-grown or western cattle, high-quality home-grown

pasture and roughage, and little or no grain. So far, grass-fed cattle have brought somewhat lower prices than grain-fed cattle. The difference is due in part to discrimination against yellow fat which may result from grass feeding. This discrimination because of color has been proved by consumer surveys and scientific tests to be unjustifiable. Kentucky farmers, therefore, have a basis upon which to work for relatively higher prices from packers for grass-fed beef.

Two types of beef enterprise best adapted

All aspects of beef production in Kentucky considered, the following types of enterprise offer the best opportunities in the postwar period:

1. Suitable home-produced or western calves may be made into good or choice beef steers through judicious use of fertile, well-managed pastures and harvested roughages, with none to 30 bushels of corn or its equivalent per steer. Such an enterprise can make profitable use of home-grown feeds produced at low cost. It is adapted to most areas of Kentucky and to variable market conditions.

2. Either of two cow-and-calf plans is practical. Both use good purebred beef bulls, and in both the cows are kept on pasture and home-grown harvested roughage, with little or no grain, and the calves are fattened on the mothers' milk and pasture. Both of these enterprises are therefore well adapted to soil-building practices in Kentucky. In one of the cow-and-calf plans relatively cheap grade cows are used, with part dairy breeding so as to have more milk for the calves than strictly beef cows usually have. The cows freshen in winter; the calves are sold as fat calves for slaughter in October or early November. Heifers are not kept for replacement unless Milking Shorthorn or Red Polled bulls are used, for their beef breeding would mean deterioration in the milking ability of the herd. In the second plan, the cows are high-grade beef cows, and the calves are sold as choice and fancy feeder calves, in competition with western calves of lower average quality. Chiefly because these beef dams give less milk than the cows with part dairy breeding, the calves make slower gains. More cattle and more land are therefore required with this plan than with the other, in order to get the same income from it. Despite rugged competition by feeder-cattle producers in the range states, however, this plan has proved popular and profitable in many sections of Kentucky.

More good purebred bulls needed

Improvement and expansion of beef-cattle raising throughout the southeastern states and the need for more good purebred bulls for

the cow-and-calf herds makes an opportunity for marked improvement and expansion of the purebred beef and dual-purpose cattle enterprises throughout Kentucky.

HORSES AND MULES

Parasite treatment and better feeding are big opportunities with workstock

Improvement in the efficiency of their horses and mules is the chief opportunity of Kentucky farmers in handling their workstock. Quality of Kentucky workstock is now rather low; management even poorer. Great improvement could be brought about by regular and adequate treatment for removal of internal parasites. The balancing of rations so as to provide adequate intake of vitamin A, calcium, and phosphorus at all seasons, and the proper selection and fitting of harness, offer means for improved efficiency.

Shortages of labor and high cost of feed tend to reduce the popularity and number of workstock on farms and to increase the use of mechanical farm power. Workstock have declined less in Kentucky (5 percent during the past decade), however, than in the country as a whole (20 percent during the same period). About half of Kentucky's workstock are mules, the other half horses.

Room for still further improvement in light horses

The light horse industry, though localized and affecting relatively few individuals, is of considerable economic importance in Kentucky. Further improvement in breeding, feeding, and management can be accomplished, especially in the case of saddle mounts used in farming operations. Most livestock farms have need for such horses.

FOREST PRODUCTS

By wise management of forests, careful marketing, and expanded uses of timber products, and by development of public appreciation of true forest values, Kentucky farmers could greatly increase their income from land now in woods or now cleared but unsuitable for other farm crops. Forests furnish private owners with fuel and timber products; they furnish the public with these same products, plus services which may be even more valuable, including water storage and streamflow control, wild life resources, and recreation.

Much of our more rugged farmland yields little return to people who farm it. Development of private or public forestry is economically desirable, therefore, on land unfit for agricultural use because of thin soil or broken topography. It is equally desirable in other areas to develop a balance between agriculture, forestry, and related industries.

One of the greatest needs of Kentucky people who own forested lands is to realize their responsibility and opportunity in producing merchantable timber. The place of Kentucky as a continuous producer of useful forest products will depend greatly upon the initiative and resourcefulness of these individuals.

Kentucky forests have much potential income value

Nearly all (about 94 percent) of the original forested land of Kentucky has been cut over or cleared sometime in the past. During World War II the demand for forest products of all kinds has been so great that trees of all descriptions have been cut, including many residual stands of low-value species and timber previously considered undesirable. The possibility of further income from many tracts has been removed for years to come; and the cleared and heavily cut tracts meantime will present special problems of management and fire prevention. Remaining stands of old-growth hardwood timber, with few exceptions, are small scattered boundaries passed over for one reason or another. Some of these remaining stands of virgin timber can be cut, but the acreage is too small to contribute much to the total welfare of Kentucky people. New growth and residual stands, on the other hand, give promise of contributing much to industry, employment, and income in the postwar period.

About 10 million acres of Kentucky land (about 40 percent of the land of the state) are wooded. About one-third of this acreage supports stands of trees that will be saw-timber size (16 inches or more in diameter) within the next 15 years; about half is in stands of still smaller trees and saplings; and the remainder is in potential forest sites which do not now have adequate tree reproduction. Of the usable wood in trees 5 inches in diameter or larger, it is estimated that 39 percent is substandard material such as cull trees and usable tops; 35 percent is sound growing stock; and 26 percent is suited to sawlogs. Of all the usable wood, 91 percent is hardwood and 9 percent softwood.

About 94 percent of the wooded area in Kentucky is privately owned and 6 percent belongs to the public. People who live on the land and are partly dependent on it for their livelihood control about 86 percent of the privately owned forests, mostly in small farm tracts. Coal mining interests, industrial concerns, public utilities, and a few individuals or families own 14 percent of the private lands. All of the tracts of 5,000 acres or more are among their holdings. Thus the wise use of forests must be built on the cooperation of individual owners, most of whom are farmers.

Good management and fire control the first steps toward restoration

The first step toward better forestry in Kentucky is the reduction of losses from fire, grazing, and wasteful cutting and marketing practices. Each owner of forested lands will need to take stock of his timber holdings; find out what kind of timber is in the woods—which trees are ready for sale, and which are over-mature, defective, and low in value and should be removed in favor of new growth; appraise new stands and consider measures which would favor rapid growth, especially of the more valuable species; and, most important of all, take a positive stand and make every effort to protect the investment in timber from fire, excessive grazing, and other external factors which impair or destroy present and potential value.

Two forest-management practices—prevention of fires and elimination of woods grazing—could in many instances result in about 35 to 150 more board feet per acre in annual wood growth. Good management could increase the production of woodland products in the state as much as a billion board feet per year.

Fires burning over nearly half a million acres of woodland in Kentucky annually have reduced the potential volume of saw timber by roughly 17 percent. Spread of fires and burning over of timbered

lands is the foremost problem in eastern Kentucky and in other sections where there are continuous forest areas. A definite plan for fire prevention and control needs to be worked out through the cooperation of individuals with one another and with federal and state agencies trained to deal with this problem. In localities where slash and brush left by wartime cutting creates a fire hazard, a program to cut and scatter brush is worthy of consideration for individual and group action.

Airplanes, radio communication, and certain other mechanical wartime equipment may be turned to prevention and control of forest fires, but before they can be used effectively, individuals must join with neighbors, communities with other communities in blocking out areas, providing manpower, and cooperating with state and federal workers to prevent and control forest fires.

In areas where woodland tracts are small and isolated, excessive grazing may be as destructive to forest growth as fire. Grazing is largely an individual problem which can be controlled by fencing livestock out of wooded areas. More general knowledge that the growth of forests is impossible if animals are allowed to graze them will lead to lower losses from grazing by livestock.

Selective cutting may need public support

Kentucky forest owners can no longer simply harvest wood, they must also produce it. Efficient production requires good management; and good management should produce a continuous or at least a periodic income to justify its cost. This will call for selective cutting rather than the clear cutting and wasteful practices of the past. Even the best management, with selective cutting, will probably not be able to support its cost for some years to come in many of Kentucky's woodlands, because of their present condition. Some of the extra cost of management may therefore need to be borne by the public.

Advancement in mechanical equipment may, however, help to make forest management self-supporting. It is possible, for example, that efficient portable sawmills mounted on trucks or tractor-type mechanical equipment and operated by trained and skilled crews, can reach and manufacture individual trees and small boundaries of second-growth saw timber. Such mills conceivably may be operated for hire and thus be available to owners of small tracts of timber. Operated at low cost this equipment would do much to make selective cutting profitable during the years while the forests are regaining their productivity. It would avoid, with no loss of efficiency, much

waste in manufacture and unsound, short-sighted cutting of small-diameter timber.

In some cases thickets of young oak, poplar, pine, or other valuable species can be thinned at little extra cost. Cutting of this kind is not likely to yield a large or immediate return, but it is necessary in order to accelerate the growth and increase the value of timber. Such simple practices may double the volume of growth and triple the value of many young stands in Kentucky in as little as 10 years.

It is estimated that 14,000 farmers might find part-time work (3 months a year) in preparing logs and other products for processing plants and in culling and working up waste timber for fuel, hewn material, and fence posts to be used on the farm or to be sold.

Better marketing methods needed

Not only better mechanical equipment for harvesting forests but also better understanding and adaptation of marketing methods are needed. Second-growth hardwood timber, to meet competition of products from the few remaining stands of virgin timber in Kentucky and other regions, will need to be dried, graded, and assembled in amounts which permit economical sale and shipment. Lumber dealers, sawmill operators, cooperating producers, or other business agencies might establish concentration points for such products as logs. Some agency will need to take the risk and perform services through which buyers can get the quantity and kind of wood they require. Few such agencies now exist in the cutover hardwood forested areas of Kentucky. Cooperation among producers is relatively new in the field of forestry but it has proved an effective means of encouraging sound forestry management, better manufacturing, and more efficient selling. Pooling of products is one way of securing a volume necessary to reach the best markets. Such cooperation is worthy of serious consideration in the postwar period.

An expansion or extension of wood-using industries from industrial areas to strategic locations near the source of supply is also a possibility. There is little telling what scientific advancement—new uses and new products—may mean to producers of wood in Kentucky. Such advancements may open up many new fields for industrial expansion and wood utilization.

During transition to a better type of timber management and marketing, land owners who want to practice sound forestry may have to depend primarily upon the sale of small lots of mill-run lumber locally. They also may produce cross-ties, mine timbers, pulp woods and other products which can be worked up for markets with less exacting standards but relatively lower competitive prices.

Wartime demand has reduced the stocks of lumber in the nation to an extremely low level. War also has interrupted the normal peacetime consumption of forest products. Accordingly, there are in prospect postwar markets which will take all the high-grade lumber produced. In the immediate postwar years also low-grade construction lumber, cross-ties, posts, pulp, and timbers which can be obtained from over-mature, defective, and low-value trees are likely to find ready sale. Rough lumber, posts, and other products which will bring no cash return can be used to reduce farm operating expenses. Because of pent-up demand it is reasonable to expect a continued period of heavy cutting in Kentucky forests. The return of men now working in other areas may furnish the labor for timber cutting.

Recreational uses can be developed

Recreational use of woodland can be coupled with the production of timber products for sale by developing sites for camping, fishing, swimming, picnics, and hunting. Suitable locations within driving distance of the larger towns and cities offer opportunity for either private or municipal development. Private owners could charge admission fees and so derive income from the enterprise.

The development of recreational facilities might attract more out-of-state tourists to Kentucky and offer Kentuckians the opportunity to increase their incomes by rendering such services as the guiding of hunting parties, the serving of meals, and renting of boats and cottages.

On many farms, fence rows, woodland borders, and other small areas are left idle and unprotected. Suitable vegetative cover can be provided for such areas by planting them to adapted kinds of vegetation to protect the soil and furnish food and cover for desirable species of wildlife, thereby providing other sources of recreation and food.

Forestry research, public aids, and public regulation

Educational and research institutions such as the Agricultural Experiment Station of the University of Kentucky, and state and federal agencies, are engaged in research on the utilization of wood, forest management, marketing, and forestry economics. The purpose of this work is to gain knowledge of the problems involved and to provide guidance and assistance to persons interested in increasing the value of timber through constructive programs of land use and forest management.

Individuals and groups can get personal advice, up-to-date information, and demonstrations on woods improvement, marking for

selective logging, saw-milling, and other practical help from the agricultural extension service and other educational agencies. Moreover, forest owners who want to protect their investments from fire can get technical assistance and financial aid through both state and federal agencies. Furthermore, there are both federal and state laws designed to assist in fire protection. Cooperation of individuals with public programs now in existence will go far toward increasing the value of forests individually and collectively.

Reductions in timber supplies resulting directly or indirectly from World War II focus attention on the importance of forest land. Proposals such as benefit payments for good woods management, a system of long-time credits for forest land development, and regulations requiring sound soil conservation and land use may come to the fore. Likewise, questions of public roads, taxation, legislation, and proposals for land purchase may present themselves. Some proposals will call for research and careful study, especially when they chart new ground.

A test which can be applied to all proposals, especially those where public regulation and aid are concerned, is the question of how they will increase timber values and protect individuals who want to practice forestry. The collective action of individuals who are interested in increasing the economic value and accelerating the growth of useful woods, will largely determine the rate of progress of Kentucky as a producer of forest products.

BUILDINGS, IMPLEMENTS, AND FACILITIES

BUILDINGS

For the greatest number of farm people to have good homes with modern conveniences, and good buildings for their livestock, there must be the possibility of constructing good buildings at low cost. Farm buildings must be planned, built, and equipped so as to save labor, to prevent losses of products and animals housed in them, and to permit farm animals to make the greatest gains in growth or quality in the shortest time. Farm dwellings too must be so built as to provide comfortable, convenient, sanitary, and pleasant homes.

Huge amount of building needed

During the past several years, building repairs and replacement in Kentucky have not kept up with depreciation. After the war, therefore, a large number of new buildings will be built and old ones remodeled, and new equipment will be added. On many of the farms, especially the low-income farms, these improvements will be financed largely from wartime savings. Careful planning will be needed to get the greatest possible benefit from these expenditures.

The research work being carried on and the plans and publications being prepared by manufacturers, building-trade associations, federal agencies, and agricultural engineers of the state colleges provide guidance for a large expansion in better farm buildings after the war, the magnitude of which is difficult to estimate. This program might well provide work for a large number of service men, war workers, and others for several years.

Plans for full use mean greater economy

In planning buildings, Kentucky farmers will consider (1) the kinds of crops and livestock best suited to the farm, (2) the volume of products grown, (3) the needs for storing and marketing the products, and (4) the interests and preferences of the family. Animals of different kinds need different types of buildings, and all should have ample space of the type best suited to their needs. In planning buildings, thought can be given to possible changes in their use later on, and provision can be made for adding other units.

Double or triple uses for some buildings that would otherwise be idle much of the time help to keep down total production costs. Brooder houses, for instance, can be used for pullets in the fall and

winter if properly cleaned, or for farrowing pens for fall pigs, or lambing sheds for winter lambs. Tobacco stripping rooms can be used as lambing sheds or (when the fire hazard is not too great because of being near the tobacco barn) as brooder houses. Small buildings of this character are most useful if they are made so that they can be moved readily. Well-planned barns with removable partitions can be used as resting sheds for horses, beef cattle, sheep or dairy cattle. Portable feeding racks can be used for partitions.

Convenience and safety not to be overlooked

By arranging buildings, feed storage space, hay chutes, feeding and cleaning alleys, and equipment so as to save steps in doing the chores much energy can be saved. Portable feed storage bins can save labor in many instances, as do self-feeders. Providing water convenient to animals at all times not only saves labor but helps to increase the production of milk, meat, and eggs.

The best arrangement of farm buildings with respect to each other, to the fields and pastures, and to the dwelling can do much to save labor, inconvenience, and time. Careful study with a view to improving the layout of buildings, fields, and fences is a worthy undertaking for many Kentucky families who are looking toward improving their farms after the war.

Serious injury to workers and even loss of life may be guarded against by planning to avoid injury from animals when feeding and caring for them. Strong bull pens and breeding racks are a needed safeguard on dairy farms. Stairs can be built substantially and equipped with guard rails, open chutes can be guarded, and all ladders can be built and placed for safety. Provision should be made for reaching high points in silos and barns to avoid falling. Forethought in matters of this kind may save much suffering and physical disability and medical expense.

Building costs can be kept down by using carefully prepared building plans so as to avoid expensive mistakes in construction, and by using materials which can be obtained locally or from the farm. Usually farm hands can do much of the labor if supervised by a skilled foreman. Fire losses can be reduced by rodding the buildings for lightning, by wiring them for electricity according to code specifications, and by storing hay and other crops at correct moisture content to prevent spontaneous combustion.

Many tobacco barns need remodeling

Remodeling or rebuilding tobacco barns with a view to curing tobacco higher in quality than formerly may perhaps be a widespread

development in postwar years. It is known that the most important factor in curing tobacco for high quality is proper control of the moisture content of the air surrounding the tobacco inside the curing barn. Control of this moisture content is possible only if certain features of the barn conform to proper specifications, and these specifications are now available as a result of recent investigations. Many growers will therefore no doubt consider the improvement of their tobacco barns in accordance with these specifications.

New materials will be available

The postwar period may see a number of changes in farm buildings through the use of new materials, the improvement of old materials, and through new designs and methods of construction. Manufacturers of building materials are looking to farms as possible outlets for many of their new and improved products. They have research workers studying how best to use these products in prefabricated and conventional buildings.

Plywood is being adapted for use in constructing dwellings and equipment in hog houses, poultry houses, livestock feeders, electric brooders, silos, forms for concrete, and storage structures for grain, vegetables, and fruit.

New methods of processing sheet metal for roofing, siding, and for the fabrication of buildings are being developed by the steel industry. These include new methods of making steel rust-resistant and insulated to prevent the condensation of moisture and loss of heat. Some concerns are preparing to put on the market all-steel prefabricated dwellings, barns, hog houses, storage structures for hay and other feeds, and livestock watering and feeding equipment.

Use of concrete products, clay products, fiberboard made of vegetable fibers, and asbestos cement products for all kinds of farm buildings is increasing. Manufacturers are preparing excellent plans and information on how best to use these products.

Development of new labor-saving machinery and new methods of processing and storing farm products will also influence the design and use of materials in postwar farm buildings. The use of chopped hay, grass silage, the pick-up baler, and hay dryers will change the storage requirements on many farms.

New uses of electricity in reducing labor and recent developments in the processing and storage of meats, fruits, and vegetables by dehydration and freezing may bring about many changes in food storage structures in rural communities and on the farm.

Acute shortage of modern farm dwellings

There is an acute shortage of modern farm dwellings in Kentucky—houses that will make for safe, happy, useful living in a place conducive to work, relaxation, companionship, and mental and spiritual growth. According to the 1940 census 24 percent of all farm homes in the state were overcrowded, 39 percent needed major repairs, and less than 3 percent had private baths.

Many of the suggestions made in the foregoing paragraphs for improving farm buildings apply equally well to farm dwellings. Convenience, safety, and storage space to meet the needs of the family should be considered in building new houses or in remodeling old ones. There is a special need to consider facilities for year-round storage of home-grown food supplies.

Housing standards which every Kentucky family well may strive to attain for its home are: tight roof, floors, and walls; an enclosed foundation; good natural and artificial lighting; adequate screening at doors and windows; means of heating the house comfortably in winter; comfortable and convenient places to bathe, rest, sleep, cook, eat, launder, sew, and encourage wholesome home life; adequate, safe, convenient water supply (see page 45); safe and convenient sewage disposal system; ample storage for food, clothing, household supplies and miscellaneous needs of the family; and lawns planted with trees and flowering shrubs to give attractive surroundings.

One of the important needs in Kentucky farm housing is for better toilet and bath facilities. As more farm houses are equipped with running water and electricity more bathtubs and inside toilets with drainage to well-constructed septic tanks will be installed. For safe sewage disposal other farm homes should have sanitary privies, the building directions for which can be obtained from the State Board of Health or the county health officer.

It may be possible to have more conveniences and better construction of homes in the years ahead. Recently developed uses of materials and better production methods will make possible new and practical improvements in the design of remodeled and newly built dwellings. Planning and arrangement of rooms and storage spaces make possible the use of all space so that none need be wasted. Less effort is required to care for a well-planned house. A conveniently arranged kitchen means better cooking with less work. When a woman becomes tired, she can do less work; she has less pleasure in working, and less enjoyment in after-working hours. Better lighting results in better and more pleasant use of time and energy. Good

tenant houses attract good tenants and promote better landlord-tenant relationships.

According to national, state, and county surveys to find the postwar buying intent of people, 39 percent of the home owners in America say they will make some sort of improvements or repairs to their properties within six months after close of the war. Unless people have a definite plan for spending, they may buy less important things rather than the most necessary ones for home improvement. These plans need to take into consideration what is required and the amount of money available for the purpose.

EQUIPMENT AND MACHINERY

Right household equipment makes for greater farm efficiency

Because income for family living depends on the success of the farm program, needed expenditures for farm production come ahead of expenditures for household equipment. However, improvements which reduce housework save time and energy for other activities in the home, on the farm, and in the community which make life more satisfying. Ranges, washing machines, vacuum cleaners, refrigerators, and other labor-saving appliances of many kinds are improvements which lead to easier and better housekeeping. Homemade appliances or conveniences can add much to the ease of doing work in the farm home. Planning together by all family members may develop an easier way to dispose of wash water, a more convenient location for the clothesline or the fuel supply, more adequate storage space for cooking utensils, or a better time for the family meal hour to fit in with church, school, or community meetings. It probably is true that men in general give less thought to ways of getting the housework done than women give to the work of the farm. More frequent exchange of ideas might be helpful.

Mechanization of farming offers great opportunities

Although the use of farm machinery has increased in Kentucky in recent years, there still are great opportunities for improving the labor and machinery program on thousands of farms in the state.

The continued mechanization of agriculture offers important opportunities for farm-implement manufacturing. Adaptation of equipment to rolling land and to small farms is of special importance in Kentucky. Wider use of winter cover crops, green-manure crops, and cultural methods which may be needed to control the European corn borer, all give added advantage to tractor power equipment over

horse-drawn types. High labor costs are stimulating thought on mechanical devices for use in cutting, housing, and stripping tobacco. Low-cost equipment in this field would have a tremendous market. Greater emphasis on legume hay may stimulate revolutionary methods in harvesting and curing the crop so as to preserve the maximum amount of vitamins and other nutrients.

Some pros and cons of investment in machinery

The large number of small farms, the variation in topography, and the diversity of farm enterprises in Kentucky present many problems in selecting and using farm machinery. The purchase of a tractor involves major changes in farm equipment, because of the plows, disks, cultivators, combines, balers, shredders, and such equipment to go with it. Such investment can usually be justified only on the larger farms or by the combined needs of several small farms. Tractor equipment usually means more timely performance of work on farm crops, and therefore better stands of crops, better quality, and higher yields. Timely performance and more work done per day are especially important in farming on bottomlands, where the weather hazard is great.

One of the chief values of tractor equipment is the ability to do a peak load of work in a limited time. Cropping systems and soil improvement practices call for the use of winter cover crops for which ground must be prepared promptly after cultivated crops are harvested. The use of green-manure crops also is increasing and tractor power has distinct advantages in turning under such crops. It is possible, therefore, for farm practices to be so based on tractor power as to increase production per acre.

The size of farm is a major factor determining the use that may be obtained from the tractor and tractor equipment. Since the cost of tractor operation decreases rapidly with increase in use up to 35 to 50 days per year, the farm must be large enough or outside custom work must be obtained, to make the tractor most economical.

Where certain machines are needed but the acreage and income of the farm would not seem to justify the expense, there is the possibility of cooperative ownership. Or it may be possible to do enough custom work to justify individual ownership. Exchange of labor and machines among farmers, including the swapping of labor for machine work, is another way to get the necessary work done.

Possible new trends in farm machinery

The war has made farmers appreciate the possibilities of saving labor, increasing production and incomes, and making the work less

arduous by using machines. Mechanized warfare has also given training to farm youths in service in the handling and use of labor and mechanical equipment, and they will undoubtedly want to apply to farming what they have learned about machines after the war. The postwar period doubtless will see expanded sales of present types of equipment and the introduction of many new adaptations in farm machinery. There may be a trend away from the use of one-half row cultivators, used at present in cultivating corn and tobacco, to the use of one-row and two-row horse-drawn cultivators on the smaller farms, and to the use of two-row higher speed tractor cultivators on the larger farms.

Spread of corn-borer infestations can be reduced if crop refuse is destroyed by plowing under, feeding to livestock, or burning. Plowing under requires the use of larger plows, equipped with such attachments as weed rods, covering wires or chains, trash guides, and self-aligning disk jointers. More complete removal of stalks will require the use of low-cutting hoes where corn is cut by hand, low-cutting sleds and low-cutting attachments on binders where corn is cut by machinery. Husker shredders and ensilage cutters are machines which aid greatly in controlling the corn borer.

The labor of haymaking may be greatly reduced through a wider use of buck rakes pushed or drawn by horse, truck, or tractor; of side-delivery rakes; pick-up balers; and field choppers. Improved equipment for putting up grass silages and the use of driers for curing hay in barns may be found profitable not only in saving labor, but in producing hay of higher quality.

New machinery and practices may be developed to reduce the labor required to set, raise, cut, and house tobacco.

Increased use of fertilizer, and the possibilities of increasing production by farming fewer acres of the best land properly fertilized, may create a need for better machines for distributing various kinds of fertilizers. The latest developments which are being studied are fertilizer attachments for plows which place fertilizer in the bottom of the furrow as the field is plowed, and equipment for applying fertilizer in liquid form.

For Kentucky conditions, there is need of designing a tobacco or hay frame which can quickly be converted into a wagon box for hauling other farm products.

Use of the all-purpose two-bottom plow tractor doubtless will increase. It might be designed with a cab like a truck so that it could be used not only for belt power and field work but also for hauling produce to market by equipping it with a detachable trailer truck.

Farm mechanization offers local business opportunities

Greater numbers of mechanical devices on farms will call for more facilities for servicing and repairing them. The development of farm-machinery service shops by dealers is helping to fill this need, but there will be room for expansion if the trend toward mechanization of farming continues after the war. Refrigerators, electrical equipment, freezer units, and all power equipment will need servicing. This will offer many opportunities for returning veterans who have had training in mechanics in the war.

Splendid opportunities also appear to exist for individuals who will establish themselves in the various counties as capable custom operators of the larger labor-saving and crop-saving machines which would permit timely planting, seeding, and harvesting on the smaller farms. Cooperative ownership, custom work, and the exchange of machines are alternatives for bringing to small farms the benefits of some of the possible farm machinery developments.

EASIER WAYS TO WORK

Greater labor efficiency is an opportunity on nearly every farm

Doing the job in easier, simpler, quicker ways is a great opportunity both in farm work and in house work. In every community a few farmers and homemakers are recognized as being especially good at certain lines of work; often they are thought to have special abilities because they get a given job done in a third to a fourth the time taken by some of the others. Usually, however, careful study of such persons at work shows that their method of doing the job is largely responsible for their getting it done easier or quicker. Others just as skillful and rapid in their work, but using poorer methods, are unable to accomplish as much, or to do it as easily. By finding and adopting the best methods many farmers and homemakers can increase the labor efficiency of their farms and homes. Elimination of unnecessary steps in doing a job, changing the order in which work is done, using both hands as much of the time as possible, using tools and equipment best suited to the job are some of the ways to approach this problem.

FACILITIES AND SERVICES

Expansion of electric service with its many uses, provision for adequate water supply for home and farm, and extension of rural telephones are undertakings for postwar years which would add immeasurably to rural welfare in Kentucky.

More rural electrification needed

At present, some 58,000 farms, or about 23 percent of all Kentucky farms, have central-station electric service. This is a tremendous advance in the short period of 8 years since 1935, when only 3 percent of Kentucky farms enjoyed that advantage. Further expansion is an opportunity for the postwar period.

According to the census of 1940, electric power lines ran within one-fourth of a mile of the dwellings on 79,740 farms where electricity had not been installed, but some of these have been serviced for electricity in the last five years. Another 131,000 farms in Kentucky were situated more than one-fourth mile from a power line and had no private electric plants.

In reaching rural people with electric service, emphasis needs to be placed upon power for doing farm jobs as well as on lighting and household appliances for the farm home. With greater emphasis on income-producing equipment, such as water systems, milking machines, milk coolers, poultry brooders, poultry lighting, food processing by freezing, hay drying and chopping, irrigation of crops, and power for other purposes, opportunities may be found for increasing incomes with which to pay for the lighting equipment and labor-saving devices in the home which add so much to the comfort and well-being of rural people.

Most Kentucky farmers will probably want to find ways to increase their net income by use of electricity if they are to afford its use in the household. Provision should be made by wiring houses and farm buildings for power equipment. The greater use of electricity will be one of the most effective means of improving the living standards of rural people and can be a means of increasing their per-capita income also.

Vast commercial opportunities offered by rural electrification

Vast commercial postwar opportunities exist in manufacturing and constructing electric power lines, in the production and sale of lighting fixtures, household equipment, farm motors, and the like, and in producing, installing and servicing, or even renting, farm electric equipment, especially refrigerators. Although hydroelectric projects under way will furnish enough power for the extension of rural electrification, it may be necessary to plan for added sources of power eventually, thus calling for important construction projects.

The extension of power lines which can furnish low-cost service to farmsteads should open a wide market for electric household and

farm equipment. Manufacturers need to consider the adapting of such equipment to its special uses on the farm. It should be reasonably priced, sturdy and simple of construction, and of a style which will be in keeping with the conditions under which it will be used. For example, size, durability, and economy of operation are relatively more important in an electric refrigerator for farm use than in one for use in the average urban home or apartment. Development of quick freezing as a method of preserving food lends special emphasis to the need of low-temperature refrigerators on farms. Should farm refrigerators come into general use, agencies for installing and servicing them adequately also will be needed. Such equipment might be owned by investment capital and rented to farmers, as lockers now are rented in frozen food banks.

Available electricity also increases the opportunity for development of local or home industries such as local wood-working plants, freezer lockers, and small factories of various kinds. These opportunities will be open to mechanically and electrically trained service men and war production workers who return to Kentucky communities.

Rural telephone service needs great expansion

Only 16 percent of the farms in Kentucky were served by telephones in 1940, according to the U. S. Census. In the areas where agricultural income is higher, however, 20 to 40 percent of the farms are served by telephones. Restricted use of automobiles during the war has emphasized the usefulness of telephones and may encourage the construction of additional lines when materials become available. For full development of farmer patronage, low-cost service will be needed. In many parts of the United States this has been possible through mutual rural telephone companies.

New hope of telephone service for farmers lies in the possible development of carrier channels superimposed on electric power distribution lines. Such development would involve lower construction and maintenance costs as there would be only one right of way and one set of poles for the two services.

Better and more convenient water supplies are urgent

As 90 percent of Kentucky rural people have to go outside of their houses for their water supply, it is apparent that there is a great opportunity for improving living conditions in this respect. The 1940 census reports show that only 4.2 percent of the rural farm dwellings in Kentucky have running water; 4.6 percent have a hand pump in the dwelling; 3.6 percent have running water within 50

feet of the house; 69.8 percent have other water supplies within 50 feet of the house; and 17.8 percent have their supply over 50 feet away. Adequate health and sanitation are difficult under such circumstances.

In addition to lack of adequate supply, a large number of the sources of water are not protected from contamination and as a result there is great loss through illness and death of both people and livestock. Kentucky farmers obtain water for household use from cisterns, shallow wells, deep wells, and springs. All these sources of water are subject to contamination if not properly safeguarded. Shallow wells, cisterns, and springs often go dry during drouths of only a few weeks.

Supplying water by drilling wells might be more satisfactory except for the uncertainty both as to supply and purity. Water from deep wells often contains magnesium and sulfur salts which make it unpalatable, and which corrode pipes, water heaters, and boilers. The geology of much of Kentucky makes well drilling very uncertain. If drillers were required to keep records of all wells drilled and to report their findings to a state and county office, as oil-well drillers are required to do, much information would be gathered which in time would be of great aid to farmers in forecasting the possibilities of obtaining an adequate water supply by drilling wells.

Present supplies of water can be improved in several ways. Various sources of water on the farm and the flow of water available need to be determined and balanced against water needs. Consideration also needs to be given to the location of water and the cost of piping and pumping it to desired outlets for use. Where necessary, springs can be cleaned to increase the flow of water and they can be protected from livestock and other sources of contamination. Wells can be drilled and farm reservoirs constructed. Pumping and storage systems can be installed where needed.

Before drilling wells, information can be obtained from well drillers and farmers in the community regarding the possibilities of obtaining an adequate supply of water. Information also can be obtained from the State Geologist. All water pumping and storage systems should be designed by a competent engineer to avoid as much difficulty as posisble. Few things are more important than a safe and adequate supply of water.

PEST CONTROL

The savings made by applying insecticides promptly and thoroughly at the time when insects are most easily controlled, has been emphasized during the war by the shortage of materials. Continued effective use of these materials in controlling injurious insects after the war is both a need and an opportunity. New insecticides which have been used by the armed forces also hold great promise for the future. The new insecticide DDT, when it becomes available for civilian use, will help tremendously in controlling flies, mosquitoes, cockroaches, bedbugs, and termites.

Besides those insects which must be controlled for profitable production of crops and livestock, there are other insects and rodents which should be mentioned here.

The common fly is first on the list. Flies and rats are the filthiest of all our pests. Besides being annoying the flies spread diseases, especially typhoid. They breed in garbage, manure piles, and privies, and fly from there to our kitchens. Clean barnyards and stables, sanitary privies, covered garbage containers, properly constructed fly-traps, and adequate screening on all doors and windows of the dwelling are the chief means to combat the fly.

Rats also, besides being tremendously destructive, carry diseases. They are scavengers, and often feed in places where they pick up disease germs on their feet, in their fur, and in the alimentary tract, and then contaminate human food. Control measures for rats are not difficult, and when conducted on a community basis are very effective. Elimination of rats on farms and in communities offers a worth-while project for individual and group action.

Mosquitoes are not long-distance fliers, and local community means of control therefore are usually fairly effective. They breed in water and must have it in which to develop. Grass and weeds serve as hiding places for the adult mosquitoes and for breeding places in water-filled cans and depressions. The elimination of breeding places by cleaning up and draining, and the treatment of water in breeding places which cannot be drained, are effective means of control. Drainage is more permanent but frequently involves a large expenditure of labor, while treatment of breeding places is effective but temporary. Both offer opportunities for community, county, or state action to improve health and living conditions.

Cockroaches and bedbugs, though not important as disease carriers and not greatly destructive, are certainly among our most offensive pests. Bedbugs are easily destroyed by proper treatment of the cracks in which they hide. Cockroaches are a little more difficult to control. By persistent effort, however, their numbers can be kept down, or they can be eradicated.

Termites are common and injurious in Kentucky where they are of the ground-nesting or subterranean kinds. While being constructed, buildings can be termite-proofed at relatively small cost by insulating them from the ground by means of concrete or metal barriers so the termites cannot enter from the soil. Supports should be of metal, stone, brick, concrete, or wood that has been treated. Where soil near the foundation of a new or old building is known to be infested, it can be treated to kill the termites. City building codes, with brief termite-proofing provisions in the mandatory sections, would do much to prevent the spread of termites. The treatment of old buildings is more difficult and expensive, but constant guard against termites would do much to hold them in check.

European corn borers, in recent years, have come into Kentucky from the corn-producing states farther north. Probably within a few years the corn borer will occur in every county of the state. It is a pest of first rank, and it may be assumed that unless corrective measures are taken, it will do much damage in Kentucky.

Most of the research on measures for control has been done in the states to the north, and the measures used there may not give good results here because of a different life cycle. Research must be done here before adequate means of control are known. The life cycle of the corn borer in Kentucky, just how this life cycle fits in with Kentucky cropping systems, what strains of corn are resistant to the borer, how effectively control measures can be carried on, and many other such points must be determined. European corn borers infest not only the corn plant, but many other plants also, including ornamental and vegetable crops. Its list of host plants is a long one.

BEES AND BEEKEEPING

Profitable beekeeping deserves much wider attention in Kentucky agriculture than it now receives. In fact, strangely enough, it deserves the attention of those who keep no bees just as much as of those who do. The reason for this is that the principal economic role of bees is in the pollination of many agricultural crops for the production of seed and fruit. Without the help of insects to bring about pollination (in which the honeybee is most important), many species of plants will not set seed nor produce fruit, no matter how well they may be cultivated, treated with fertilizer, and protected from diseases and pests. At least 50 agricultural crops, many of which are important in Kentucky, depend upon honeybees for pollination, or yield more abundantly when bees are plentiful. With the gradual disappearance of woodlands and their nesting sites in hollow trees, especially in the more prominent agricultural counties, the population of wild bees has become greatly diminished, and domesticated bees must be depended on chiefly for this pollinizing.

The keeping of bees to assure adequate pollination and to furnish honey for family use or for sale, is a postwar opportunity for Kentucky farm people, especially those on small farms who have the necessary interest and liking for the work to make a success of it. Bee diseases, especially foul-brood, are a serious drawback however. An adequate bee-disease law, similar to those in neighboring states but adapted to Kentucky conditions, with funds for carrying out its provisions, is badly needed. With the enforcement of such a law, beekeeping in Kentucky would have a promising future. Kentucky now has a bee-disease law providing for inspection of colonies, but it provides no funds with which to carry on the work.

AGRICULTURAL MARKETING, COOPERATION, AND TRANSPORTATION

Improvements in marketing, processing, and transporting farm products can add to farm income as fully and effectively as improvements in production. Cooperation among farmers and between farm people and those who handle farm products is one effective means to that end.

MARKETING, STORING, AND PROCESSING

Facilities for marketing and processing farm products in Kentucky have been developed to meet the prevailing conditions in the area. Except for tobacco, agricultural production in Kentucky is highly diversified and surpluses over the requirements of the state are relatively small. Because of the many small general farms, few large farms, and even fewer specialized farms, the quantities marketed at one time are generally small, and this exerts a great influence on the character of the markets and of the processing facilities developed for these products within the state. Markets tend to be small and secondary to other large wholesale centers. Processing also tends in general to be small-scale and adapted to local consumption. Any important developments in marketing and processing that may be contemplated in the postwar period should recognize the character of agricultural production of the area served.

Capacity of marketing and processing facilities will doubtless be generally adequate to meet the postwar needs for distribution and manufacture of farm products. However, changes in type of production in different areas, or in the form of products marketed (such as whole milk versus cream) may call for considerable building and conversion of plants in the postwar era. New processing developments may also bring new needs for plant conversion.

Quality needs greater emphasis

Marketing in Kentucky should give more recognition to variations in the quality of products marketed. Tobacco and livestock markets tend to be sensitive to quality differences, but most markets for eggs, poultry, and dairy products offer one price for a given quantity regardless of the quality. This condition is largely the result of small unit production and sale from farms and the fact that as the volume of products handled by the processor increases, unit costs

decrease. Recognizing this fact, the processors emphasize volume rather than quality. Because of the competitive nature of the processing business, it is imperative that producers take a more active part in either developing their own cooperatives for handling their products or insisting that the established channels be changed to the point where greater recognition, through pricing, is given to quality differences.

New market outlets in prospect

Commercial freezing and preserving of fruits and vegetables may bring a new market for Kentucky products. A commercial quick-freezing plant in the heavy fruit-producing area of Kentucky would lend much stability to the marketing and prices of strawberries, peaches, and apples. Fruit too ripe or too small for shipping is satisfactory for quick-freezing, while under the usual marketing procedure this fruit either is wasted or is sold at reduced prices. Fresh market gluts may also be avoided by the availability of a frozen-food outlet. In most years the frozen-fruit market will be able to compete satisfactorily with the fresh fruit market for the better shipping grades of fruit. Enlarged opportunities for the production and marketing of vegetables would also follow this development.

Frozen food lockers have developed a wide appeal, both to urban and to rural people during the war. This development was in its infancy in the prewar period in Kentucky but with its popularization as a consequence of the war, there is a possibility of extending the system to all parts of the state. Early recognition by producers of the opportunities of this expanding market will be desirable, both to the producer and to the user of frozen foods. Locker plants also may, with advantage, extend their services to the killing and dressing of hogs and cattle for farmers.

Dehydration of food products on a commercial scale is another new development that may open new markets for agricultural products. Consumer acceptance of dried whole milk, sweetpotatoes, Irish potatoes, cabbage, onions, and other vegetables will hold the key to possible opportunities in this field.

Roadside and curb markets need further development

Much remains to be done to improve the marketing facilities of countyseat and other small towns and cities of the state. Consideration should be given to efficient ways and means of assembling quantities and qualities of products that will encourage the movement of these products to consuming centers where an active demand for them can be developed. In view of the fact that agricultural production of

Kentucky is decentralized and consists of many small producing units, curb and roadside markets selling graded and standardized products offer an opportunity for better marketing in many communities.

Expansion of market supervision and reporting seems desirable

If agricultural products are to find a ready market at points distant from producing centers it is necessary that quality be so standardized that a distant buyer may buy with confidence without personally inspecting the product before the purchase is made. Federal and state inspection and grading services are available to shippers of many agricultural products, but greater use of this service is needed for efficient marketing.

Expansion of market price reporting will also assist farmers and shippers in locating desirable markets. In recent years the leadership in developing these services has been taken by the federal and state governments although private reporting services have played an important role. In Kentucky the reporting service might be expanded to the larger local livestock auction markets and to cover such commodities as poultry products, dairy products, fruits, and vegetables. Many producers believe that greater control over sanitation, weighing, and market practices at local markets will result in direct benefits to Kentucky farmers. Similarly, an adequate, enforced egg candling and grading law would go far toward eliminating marketing losses, and it is believed that this would raise prices and incomes through decreased losses of edible products and through quality improvement.

TRANSPORTATION

Transportation a vital link in marketing

Continued improvement in transportation facilities is an essential accompaniment to better farm production and farm family living Only 19 percent of all Kentucky farms are on hard-surfaced roads, and only 58 percent are on improved roads. Obviously many Kentucky farms are still inadequately served in this respect, in spite of rapid improvements in roads and in use of motor vehicles in recent years.

Production of commercial quantities of perishable products, such as fruit, vegetables, dairy products, and eggs, is at present largely restricted to areas served by trucks, traveling on all-weather roads. A more adequate road system would open to new areas the possibility

of producing those products comercially. Adequate farm-to-market roads throughout the state is a need, the meeting of which depends largely on state action, that farmers as individuals and as groups might well promote.

Cooperation essential in meeting transportation needs

Further development of assembly and transportation of farm products holds opportunities for better service and lower costs in many areas in Kentucky. Careful study of common local problems by farmers and shippers is required to adapt the developments to local needs. Action of various types may be called for, but it will likely involve larger and more economical shipping units and less duplication in assembly and transportation. Desired goals may be reached in some localities by larger production, in others by cooperation among farmers in marketing, and in still others by cooperation among dealers and shippers to reduce duplication in facilities, trucking, and the like. In all cases better cooperative relations between farmers and shippers will promote local marketing by giving a better understanding of local marketing needs. Wartime experience has taught that many wastes can be largely overcome by neighborhood cooperatives. These lessons must not be lightly ignored in plans for the postwar development of local farm markets.

Insurance of trucked products

Another problem needing more attention on the part of farmers using hired trucks, is the insurance of products under the care of the trucker. Definite responsibility needs to be established for losses through death or crippling of livestock, and for other losses and undue deterioration of quality of other products in transit. In some states these problems have been met by cooperative ownership and operation of trucks by the users.

DEVELOPMENT OF FARM COOPERATIVES

Full realization by farmers of the opportunities in cooperation can lead to an expansion of agricultural cooperatives in Kentucky in the postwar years.

Cooperative handling of farm supplies offers opportunity

Current developments in cooperative handling of farm supplies seem to offer great opportunities in the years immediately ahead. Until very recently cooperative farm-supply organizations made little

growth in Kentucky, yet in all the bordering states except Tennessee the handling of farm supplies is the largest single cooperative enterprise. The needs and opportunities are just as great in Kentucky as in these other states.

An adequate cooperative farm-supply service for the state will require, in the first place, the organization of numerous cooperative retail outlets for handling feed, fertilizer, gasoline, fencing, and other items needed on the farm. In the second place, the establishment of feed, fertilizer, and other similar processing plants at strategic points may be needed as a dependable source of supply to service the retail units. Location in relation to source of raw materials, freight and water rates and privileges, and availability of present buildings suitable for use are important factors influencing the location of these processing plants.

Marketing cooperatives merit greater development

More farmer interest and participation in marketing cooperatives and some further development of these cooperatives are definite postwar possibilities in Kentucky agriculture. Present products marketed cooperatively in varying degrees in Kentucky include milk, livestock, wool, seeds, eggs, poultry, potatoes, fruits, vegetables, sorghum, sweetpotatoes, soybeans, and tobacco. Altogether, however, only a small percentage of Kentucky farmers now market these products cooperatively. There are several reasons why participation has not been greater: (1) the small average quantity of marketings of each product, other than tobacco; (2) the diversified nature of Kentucky agriculture; (3) the large area which must be drawn upon to obtain enough of a given product for grading for resale or for efficient processing; and (4) a lack of farmer interest in developing new marketing cooperatives. As the benefits of cooperative marketing are more fully demonstrated and understood, farmers will probably participate more in existing marketing cooperatives and perhaps some new cooperatives will be organized.

Handling several farm products by one cooperative may be an important postwar development. While the volume of one product marketed from an area might not be enough for efficient operation, the combined marketings of several products might well provide the necessary amount of business. Moreover, a local marketing cooperative might also serve as a local farm-supply distributor. This type of combined marketing and farm supply cooperative may be the way to overcome several of those factors standing in the way of the development of marketing cooperatives in Kentucky.

Service cooperatives needed

Rural Electrification Administration cooperatives have developed rapidly in Kentucky, but as yet only 23 percent of the farms are served with electricity. Continued rapid expansion in this field may be expected as soon as materials are again available. A revival of cooperative farmer telephone service is badly needed. This may be a more practical development in the postwar period than in the past because of recent technological advances in communication. Low-cost telephone service would undoubtedly be attractive to many Kentucky farmers.

Insurance cooperatives

Farmers' mutual insurance companies have maintained their membership since early in the century. Few associations have been formed since that time but the opportunities which are available through mutual insurance should not be overlooked. In Kentucky, cooperative automobile insurance is a recent development demonstrating farmers' interest in combined action.

AGRICULTURAL CREDIT

More credit agencies need to be geared to service during hard times

Many sound credit agencies now are operating in Kentucky, and it seems likely that credit will be available to farmers after the war, at reasonable rates, provided no serious depression emergency arises. The great need in agricultural credit, however, is for more sources having both the capacity and the lending policies to service farmers' credit during times of adversity as well as they are able to service it during times of prosperity. Too many of those who lend to farmers still are concerned chiefly with the assets to secure the loan, not with the ability of the borrower to repay from income. It is when times are hard that the real test of a credit agency comes. Those which must greatly restrict their lending and foreclose many of their mortgage loans serve to aggravate a bad situation. Those, on the other hand, that have had the breadth of view to look forward to such emergencies, adjusting their appraisal policies and the terms of their contracts so as not to be forced to restrict their service at the very time when farmers have greatest need for it—those are the credit agencies which perform a valuable service for agriculture and are worthy of full farmer and public support.

Danger lies in the extension of credit, especially short-term credit, for land purchases at increasing prices. If farms are bought at prices which postwar earnings will not justify, as was done during and immediately after World War I, many purchasers will find themselves in financial distress, and serious credit problems will arise to be solved in the postwar period. Farmers who pay off debts and accumulate funds for the purchase of better living conditions and labor-saving machinery after the war, and for improving their farmlands, may be in a much better financial position than those who use their savings and stretch their credit to buy more land.

Fixed annual charges for interest and principal frequently work serious hardships on the purchasers of farms, and sometimes result in foreclosure, even though the amount of the mortgage debt is not out of line with the long-time productive capacity of the farm. A widespread introduction into the farm-mortgage field of a plan of variable payments might relieve pressure on farm purchasers. Together with long-term amortized repayments this would reduce foreclosures during periods of adverse economic conditions.

Danger of over-extension to meet replacement needs

During the war, farm income has increased more rapidly than farm expenses, and many farmers have therefore reduced their mortgage indebtedness. In Kentucky, the farm mortgage debt was about 2 million dollars lower in 1943 than in 1939, and it undoubtedly will be lowered further unless farms change hands more rapidly and at higher prices than incomes will support. Savings, also, have been put aside into war bonds and bank accounts which will help farmers meet postwar purchases without the use of credit.

Part of the savings, however, have resulted from delay in meeting the depreciation and repairs on buildings, machinery, and equipment. Replacements will be called for after the war, and if savings are insufficient, credit will be needed. Over-extension of credit for these needs, or use of savings for replacements not economically sound, would have an inflationary effect on prices. This will be a definite danger.

Sound use of credit to improve production

Short-term production loans to farmers seem not to have increased out of proportion to operating costs during the war, in spite of increased production and some new enterprises to meet special war needs. This is a healthy condition, much different from the situation during World War I, when much of the tremendous expansion of short-term credit in that era had to be refinanced into long-term credit, and repaid over several years with farm products selling at much lower prices.

The trend toward mechanization of agriculture is likely to continue after the war and, if so, will call for increased investment by many farmers. Wise expenditures for income-producing improvements such as farm machinery, water reservoirs, land terraces, electrically operated tools, tractors and tractor equipment, and the like, doubtless can be financed satisfactorily through present credit agencies. Postwar conditions undoubtedly will require farmers to use an increasing proportion of their total capital for such machinery and equipment and a smaller proportion for investment in land. That is, the capital required to own and operate a farm seems destined to rise because of the need for more operating capital. This, in turn, may require sources for a permanently larger volume of agricultural credit than in the past.

Improvements in rural living, such as better homes, electric lights, and refrigeration, are worthy postwar objectives, but it is good com-

mon sense never to expand these improvements beyond the earning capacity of the farm—especially if credit must be used to acquire this type of improvement. It is a good policy to finance improvements of a consumption character out of the surplus earnings of the farm and to avoid credit unless the farm earnings are clearly above what is necessary to maintain efficient farm operations. In brief, farmers during the postwar period will need to exercise considerable caution in the use of credit and to devote its use particularly toward providing for more efficient production.

Thorough-going soil-improvement measures are urgently needed on farms throughout Kentucky. It has been clearly demonstrated that capital put into well-advised soil improvement is as sound an investment as can be made in farming. Lending agencies could well look forward to providing a more extensive credit service to farmers for soil improvement. Such loans, to be most practical, would extend over a period long enough to enable them to be repaid from the increased earnings resulting from the improvement.

Investment opportunities offered in cooperative enterprises

The trend toward cooperative effort in marketing and processing of farm products and purchasing farm supplies calls for increased investment by farmers in enterprises not directly connected with the farm. Cooperative warehouses, feed mills, lime crushers, and milk plants call for capital, a good portion of which should come from farm people. Farmers with surplus funds can find investment opportunities in undertakings of this character and use their knowledge of farm and local conditions to safeguard the investment more adequately than if funds were invested in more distant businesses. Investments in combines, trucks, hay balers and other equipment for doing custom work, also are postwar opportunities for farmers who have the funds and mechanical ability to operate such equipment effectively.

Much agricultural credit is available to farmers through cooperative credit associations. The opportunity to make these associations more effective in their service to agriculture is available to borrowers who will take a more active part in their operation.

OWNERSHIP AND RENTAL OF LAND, AND FARM LABOR

The relations of people to the land—the prevailing systems and customs and legal rights by which people hold land and work upon it—have much to do with the economic and social welfare of rural people. It is generally agreed that stability of tenure on the land, rather than frequent moving of families from one farm to another, and adequate size of farm units to permit good use of the land, are essential to sound, satisfactory community life. Home and community life in rural areas are usually most satisfying when most of the farms are operated by their owners.

In general, owner-tenant and owner-laborer situations are at their best when the following four conditions are met: (1) The tenant or laborer and his family get a good income and an adequate living from the farm. (2) The landowner gets enough income to compensate him satisfactorily for the use of his land and the expense of maintaining the land and improvements. (3) The productivity of the land is maintained and increased and improvements are kept up satisfactorily. (4) The tenant or laborer and his family have the greatest possible security of tenure and the opportunity to enjoy and contribute to the activities of their community.

Unproductive land aggravates tenure problem

Difficult tenure problems in Kentucky concern not only tenants, croppers and farm laborers, but also many owner-operators and landlords who have heavy indebtedness or farms which are too small or too low in productivity. Low soil productivity and low incomes handicap all tenure groups. On many farms, even if the tenant or laborer got the entire product instead of part of it, his income would still be on a poverty level. Low incomes result in low standards of living and often in poor health and poor education. Improvement of the land and better farming are therefore basic to the solution of farm-tenure problems in Kentucky.

Renting on a year-to-year basis without adequate planning usually results in over-cropping, soil depletion, and decreasing incomes to both owners and renters. On sloping lands in particular there is the necessity of grass-legume sods and the appropriate livestock to use them. Long-time profitable farming, regardless of the type of tenure involved, must embody these good-farming practices.

Right attitudes are basis of good landlord-tenant relations

Tenure studies in Kentucky and elsewhere have shown that the attitudes and personal qualifications of tenants and landlords are of great importance to the success of tenant farming. A good tenant applies the technical knowledge, physical strength, industry, alertness, and skill necessary in giving good care to the crops and livestock for which he is responsible. He has financial backing for efficient operation and the personal qualities which make him deserve the confidence and cooperation of his landlord. A good landlord understands and is interested in agricultural problems, has sufficient credit and willingness to provide needed improvements, and is fair and cooperative. Good tenants and landlords have pride in farming and in good community life. The farming of rented land is a joint undertaking which requires that both parties shall have confidence in each other and that each shall be anxious to do the fair and right thing by the other. The development of these characteristics on a wider scale in Kentucky is a postwar opportunity for both tenants and landlords.

Land tenure extension work in Kentucky and other states has proved that an effective means of improving tenant farming is to hold tenant-landlord conferences at which the tenants and landlords discuss their problems frankly and consider ways and means for betterment. In these discussions care is taken to hear the experience and methods of both successful and unsuccessful tenants and landlords. These conferences have been beneficial both to landlords and tenants. They offer opportunities for improving landlord-tenant relationships in the postwar period.

Improvements urgent in common lease agreements

The right attitudes and personal qualifications of tenants and landlords, however, are not enough. For success, both the farm itself and the leasing arrangement must offer a basis for good farming. General improvement in the following respects would do much to improve tenant farming in Kentucky.

1. Farms large enough and productive enough to return a good living, with house and other improvements that contribute to the comfort and health of the tenant and his family.

2. Leasing agreements that provide a basis for farming profitable to both the farm owner and the tenant.

3. Both owners and tenants interested in rental agreements that

make a fair division of income and expense in both good years and poor years.

4. Reasonable assurance for competent tenants that the lease will continue through a period of years with provision that adequate notice will be given either party by the other in case the lease is to be terminated. A lease that automatically continues from year to year unless notice of cancellation is given within a specified period gives this kind of assurance.

5. Provision in the lease that the tenant will be reimbursed at an amount agreed upon beforehand for any improvements put on the farm at his expense provided that he has not realized fully on the value of the improvement at the time of his moving from the farm and that the improvement was made with the approval of the farm owner.

6. Provision that when differences occur between the tenant and landowner such differences are to be settled by arbitrators agreed upon by the two parties, does much to keep working relations smooth.

7. Every reasonable effort by tenants to prevent undue injury of the rented property.

Land-tenure code and new legislation needed

The present tenure laws of Kentucky are vague and incomplete in many particulars. An acceptable codification of the state laws covering the various aspects of agricultural landlord and tenant relationships is a distinct need. The codification might well be supplemented by provisions governing relationships not included in present laws.

Much has been heard in recent years about the advisability of requiring by law that rental agreements be made in writing. Such a requirement probably is not advisable. The chief advantages of a written agreement are that it is more complete and serves as a memorandum for future reference.

Consideration should be given, however, to the enactment of a statute providing that, in the absence of a written agreement to the contrary, all agricultural rental agreements shall contain the provisions of a model lease established by the statute. Under such a provision the model contract would seek to establish the most desirable relations possible, and unless a landlord and his tenant developed a written agreement for their own particular case, their rental agreement would automatically be covered by the provisions of the statu-

tory lease. It would serve as a guide for persons desiring a written understanding, and it would be necessary for persons desiring terms different from those established by law to have a written agreement. Yet it would not impair the freedom with which the two parties could enter into mutually advantageous relations.

Consideration might be given also to modifying the deficiency judgment as it now applies in foreclosure procedure. There could be established by courts a "fair long-time value" for foreclosed farms, regardless of the bids of mortgage holders. If the high bid on the foreclosed property were under this fair long-time value, the deficiency judgment then would be limited to the difference between the fair value and the amount due on the debt. This has been done in some states in order to avoid undue hardship on operators whose mortgages have been foreclosed. A revision of our system of taxing agricultural land, including the exemption of homesteads from taxation in an effort to encourage home ownership, might also be given consideration.

More security of tenure desirable

Probably the most serious shortcoming of our rental system is the frequency of moving from farm to farm. According to the U. S. Census, only about half of tenant families rent the same farm as long as two years, and less than a fourth for 5 years or more. Frequent moving reduces the chances of tenants and their families to enjoy and participate in community activities. It is costly in time and expense and tends to prevent putting into effect long-time farming plans, including livestock and soil-improving enterprises.

As it is desirable that most farms be operated by owners, it is desirable also that competent tenant farmers who have the desire to own the land they farm should be able to buy good farm land under terms which will not be likely to put them in financial distress later on. This means that they should be able to borrow money for a long term at low interest rates, with provision for amortized payments of principal and interest, and with provision also for variable payments —that is, for higher payments when seasons and prices are good and lower payments, in keeping with a landlord's share of the farm income, when prices are low or crop seasons are poor.

Bidding for farm land by those not interested in tilling the land themselves, is a definite hindrance to the achievement of farm ownership by those who till the soil, because it tends to raise the going price beyond the long-time capacity of farm land to support it. Inflation in land prices could be avoided, to some extent, by appropriate

appraisal and loan policies of lending agencies, and perhaps by appropriate public tax policies also. An independent or public appraisal service might aid toward keeping going prices in line with real values. The setting up of a service of this type appears to be a postwar opportunity.

Farm wage workers require more consideration

In many respects farm wage workers are in a more insecure position than any other agricultural group. Many farm laborers work only part-time. Also, in many cases housing and sanitary conditions for them are poor.

Since the families of farm laborers furnish many of our future citizens, both rural and urban, a program aimed at raising their living standards, improving their health, increasing their security, and increasing and stabilizing their incomes is needed. Programs directed toward enabling them to attain more adequate family income and levels of living offer postwar opportunities. Sufficient space for families of farm laborers to have gardens and livestock for home use would offer one means of improvement.

Another outstanding need is more nearly year-round employment for farm laborers. In some cases the combining of employment in agricultural, industrial, and public works affords this opportunity. Underemployment in some areas could be reduced if some laborers went to other areas where more laborers are needed, either permanently or for certain seasons of the year. Provision for social security and unemployment insurance need to be more generally extended to farm workers.

Ways and means by which wage workers and nonoperating tenants not living on farms may rent and eventually own their house and garden space well may be given postwar consideration.

RURAL HOME AND COMMUNITY

For the general well being of Kentucky people it is highly desirable that all rural families be healthy, educated, well clothed and housed, and have homes, whether owned or leased, that are comfortable, convenient, and attractive. It is important also that rural people have a "sense of values" in tune with rural living—that they know the pleasures as well as the hardships of farming; that they feel the mutual responsibility and solidarity which grows from satisfying family relationships; and that they have within themselves the resources for recreation and self-improvement so frequently needed in life. Many families now have these resources, but the opportunities of the postwar period, if fully developed, will enable many more to have them.

To obtain these various resources for satisfactory living, on a wide scale, rural families can do a great deal for themselves, individually. But they cannot do it all, working separately. They must work together, in communities, to make adequate provision for education, recreation, religious development, and local government.

These objectives cannot be reached quickly and easily. They call for diligent long-time effort by farm people, by organizations concerned with the improvement of agriculture, and by sympathetic local, state, and national governments. The farm family does not stand apart from the rest of the nation. General prosperity and a high level of industrial employment go hand in hand with satisfactory income for farmers. Regardless of national conditions, however, many opportunities for rural improvement are within reach of the family and the community through their own effort.

THE HOME

The home and family are more important than all other influences in developing individual persons—physically, mentally, socially, and spiritually. To make Kentucky homes better places in which to live and develop these qualities, farm families need to consider the opportunities for improvement in the postwar period. As means of evaluating its needs and the ways of meeting them, each family may well raise the following questions.

Is our family well housed?

More Kentucky farm people could have attractive, serviceable homes, set in neat, well-kept, and attractively planted yards. Houses can be well constructed, painted, screened, kept in repair, comfort-

ably and attractively furnished, and conveniently equipped. With all members of the family contributing their efforts and skills, agriculture in Kentucky can support such homes.

Programs of adult education make available to homemakers the skill to convert old, worn furnishings and unattractive homes into things and places of beauty. Furniture may be refinished, upholstered, slip-covered; chairs reseated, worn floors repaired and refinished. Paint and whitewash do wonders to shabby surroundings. Hooked and braided rugs made at home from scraps add beauty and color. Homemade conveniences can lighten the labor of the homemaker and increase the comfort of all the family. There is almost no end to the number of home improvements which can be made through cooperative effort in the family. Good judgment and good taste in bringing about these improvements can be developed by reading, listening to expert advice, talking over ideas, observing what others have done--in other words, by continuous learning.

Is our home well managed?

The home has been said to be "the biggest little business in the world" because no enterprise so small calls into use such a wide variety of skills, such a broad field of information, and such a large number of materials. Such an enterprise can no more be carried on successfully without wise planning, good methods, organization, and cooperation, than can any other business enterprise. Wise use of time, energy, money, and other goods secures for the family a well-ordered and smoothly running home where there is greatest accomplishment with least fatigue and friction. Good equipment and good methods of doing the work of the home make for efficiency, save the energy of the homemaker, and provide opportunity for personal improvement, leisure-time pursuits, and community activities.

Is our family well clothed?

Clothing that is carefully selected, clean, pressed, and in good repair is a good morale builder. It need not be expensive. Family resources can be used to provide clothes that are comfortable, safe, attractive, and suitable for the work of the farm and home, and that conform to community standards for social activities. Keeping the family well-clothed on a moderate income is a challenge to the knowledge and skill of the homemaker. Home sewing reduces the cost and improves the quality of many items of clothing and house furnishings. The necessary skills and techniques may be gained by taking part in the activities of schools, the extension service, and other educational agencies.

Is our family well fed?

In our own country and our own state there is much malnutrition that could be prevented if people in general knew more about good nutrition and about using our natural resources to produce food that meets nutritional requirements.

In addition to the growing of products for sale, farm families in Kentucky can produce enough food of the right quality and variety to provide for resistance to disease and for the health which comes from a good diet. Kentucky's soil and climate make it possible for farm families to produce 80 to 90 percent of the family's food supply. With a well-planned garden, a home poultry flock, a family cow or two, a few animals raised for home butchering, and the use of canned, stored, dried, cured, and frozen foods – with possibly a patch of sorghum cane, and a few acres of corn or wheat to be ground at the nearby mill, the farm family can be well fed through both prosperity and depression.

Producing the food supply at home can mean not only a good, healthful diet, but also more farm income. Because there is less food to be bought, there is more money for buying other things that the farm family cannot produce. A good diet for a family of five people costs $500 to $600 a year if purchased at the grocery store at prewar prices. The cash cost of producing this food on the farm is much lower. The difference will buy farm and home improvements, comforts and conveniences, books, magazines, education and recreation, or it may be added to the family savings account.

Good nutrition depends not only on having the necessary food available but also on care in preparation of the food and the right choice in eating. Knowledge of food values, preparation, and service to improve palatability, and pleasant family meal hours all contribute to good health through good nutrition. The family meal hour offers one of the best opportunities for discussing mutual problems, interests, and accomplishments in such a manner as to develop a feeling of mutual responsibility and cooperation within the family. By contributing to a pleasant meal hour, members of the family can do much to encourage the housewife in her continuous job of planning, preparing, and serving wholesome and satisfactory meals.

Are there good family relationships in our home?

Good family relationships require time, thought, effort, and cooperation by all. They don't just happen! They are, however, most important to human happiness and personal satisfaction. The ex-

pression of affection and respect for each other gives self-confidence and a sense of security to the members of the family. Almost all families can bring about improvement in these things—and they are extremely worth while!

Mutual sharing by members of the family in making decisions, assuming responsibility, doing the work, and enjoying the results of their labor give solidarity to the group, satisfaction and security to its members, and train future citizens in the true meaning of democracy.

The example set by parents is more important than any other influence on the life of a child. Standards of marriage and home life especially are determined by this example. It is important, therefore, for parents to take every opportunity offered by schools, churches, and other organizations to help them in their own relationships and in the guidance and training of children.

THE COMMUNITY

Good neighbors and an active community have been of more than usual importance to many farm families in Kentucky during the war period. With most of the life of a farmer and his family so closely dependent upon neighborhood and community relationships, it is desirable in the postwar period to give attention not only to making the farm a more successful enterprise and a better place to live, but to improving life in the comunity. To accomplish this, the people of each community can ask themselves these further questions, in addition to those already suggested about home and family life.

Does our community have the kind of schools we want?

There are certain standards for schools that are fairly easy to judge. The school buildings should be well located, well constructed, of ample size, attractive and comfortable, and serviced with enough equipment for good teaching. Furthermore, schools should be within the reach of everyone. Teachers who are well trained, employed because of their qualifications, adequately paid, and who live in the community as a part of it, help to make the school a center of community life.

To meet these standards and obtain the values that come from good schools, school revenue would have to be increased in many areas. Through increased income resulting from better farming, as discussed in this report, farmers would be better able to support good

schools. Improvements in the schools can also be made, in many communities, through the action of the families themselves. Progressive members of the community, interested in school activities, are always needed on school boards and should be willing to accept the responsibilities involved. Active parent-teacher associations provide the opportunity for the parents and others interested to keep in close contact with the school. Local people can do much toward helping new teachers become actual members of the community. Sometimes the school facilities themselves can be improved through direct cooperative action, such as in making the school grounds more attractive by landscaping with shrubs and trees.

Active participation in the program of the school by members of the community offers one means of adjusting the school program so as to train farm youths for their places in the economic and social life of the nation. A broad background of basic education, upon which vocational education can be built, needs to be maintained; but the curricula of many schools well may include vocational training in agriculture and home economics and in some fields of urban employment.

Though better rural schools are urgently needed, nevertheless too many families do not make full use of the school facilities now available. Unnecessarily irregular attendance at school now handicaps great numbers of farm boys and girls; and fully as urgently needed as new school facilities is the determination of parents to send their children to school regularly, throughout the term.

Does our community provide for education of adults?

As farms and homes become more mechanized, and practices involved in farming and home life become more complex, the need of farm people for practical education will increase. Every community needs organizations to keep men and women up-to-date in ways of farming and homemaking. Where permanent libraries are not available, mobile units may provide library service to everybody. Evening classes, short courses, films and film strips, forums and lectures give adults a chance to learn more about subjects of importance to all citizens as well as about farming and homemaking. Such activities help to develop full appreciation of the many aspects of rural life.

Does our community provide for recreation?

Good recreation contributes greatly to health and happiness. Every community needs the facilities for wholesome recreation, and some employ qualified recreational directors. Community buildings

are convenient places for all kinds of meetings and activities. Picnic grounds make it possible for people to break away from their work and to become refreshed by simple games and pleasant association. Farm reservoirs and streams with fish, wildlife conservation, and better stocking with game make a community more attractive to both young people and adults. Improvement of scenic spots develops community pride. Facilities for winter and summer games, both indoors and outdoors, provide year-round activities for everyone. Community choruses, orchestras, hometown plays and pageants develop the talents of those who take part and enrich the recreational life of the whole community. Community festivals and play-days, and organized groups for people of all ages, help to provide a well-rounded social experience for all. School playground equipment helps children to use leisure time constructively. Communities with these opportunities for wholesome recreation will be rewarded by happier, more contented people, both young and old, and by relief from many difficult problems of juvenile delinquency.

Does our community have cooperative organizations that solve farm problems?

Local cooperatives in many areas have helped farmers to do together what cannot be done individually. Common economic interests many times bind together the people of a community besides providing the opportunity for purchasing products of better quality, for obtaining better service, or for realizing higher returns for products sold—as discussed on pages 54 to 56.

Does our community provide for development of local leadership?

Vitality and richness of community life depend largely on the foresight, judgment, and energy of community leaders. Too much dependence on outside leaders has a deadening effect on community life and progress. Both men and women, young and old, from both farms and towns or villages of the community are needed among the leaders. Most occasions that bring people together and give many persons definite responsibilities to carry out, provide opportunities for developing leaders.

Does our community have good local government?

Just as "a chain is no stronger than its weakest link," a nation is no stronger than the local community. Voting in all public elections, willingness of qualified citizens to run for office and accept responsibilities of leadership, are all part of better government. Public affairs

can be discussed in forums and study groups in which farm and town people work together on matters of mutual interest. Officials can be selected because of their qualifications, and because they understand the work they have to do. Local government has a very great obligation to the community, and can accomplish much through proper exercise of its responsibilities. Published reports of officials help citizens to understand the problems of their government.

Does our community offer adequate opportunities for religious development?

Few people would want to live in a community which had no religious influences, yet many people take such influences more or less for granted. The religious life of a community is the responsibility of its citizens. Attractive church buildings of adequate size, well equipped and landscaped, can be the pride of the whole community as well as of the immediate congregation. They attract good ministers who in turn can help carry on effective religious programs. The development of such programs can be cooperative enterprises participated in by most of the residents of a locality. The construction of church buildings, the planting of trees and shrubs on the church lawn, the painting or modernizing of the minister's house, and many other similar undertakings also offer opportunities for people to work together in promoting the religious life of the community.

Some communities try to support so many churches that the religious life of the community suffers; but more frequently there are too few services of worship and meetings for religious education. Ministers who have served as chaplains with our armed forces will return to civilian life with exceptional understanding of personal religious needs and of human suffering. Rural communities that get and retain their leadership will be fortunate.

Does our community have adequate medical and hospital facilities?

It is of utmost importance that rural communities consider ways of getting and maintaining the services of good doctors, dentists, and nurses. The emergency type of service which many doctors and nurses will have performed with the armed forces should fit them well for practice in rural areas where they must rely so much on their own knowledge and ability. Unless specific ways are developed to attract them to rural areas, however, many communities may find that they still have too little medical service in the postwar period.

The development of small local clinics and hospitals is one means of accomplishing this purpose. In some communities physicians might

join together and organize clinics so as to provide more specialized and efficient service. In others, cooperatives might be formed, in which the members pay fixed sums each year for medical service. Such cooperatives might attract physicians to some communities, and bring medical services within reach of all. Group health insurance is one means for protecting the individual or family against large unexpected medical and hospital expenses.

County or municipally owned hospitals or clinics may be needed in some communities. If plans are made for public works in the postwar period, serious consideration can be given to the need for health centers, clinics, and hospitals. The mobile medical and dental outfit used by the armed services may be adaptable to rural needs in Kentucky. It is possible too that surgical instruments, X-ray machines, and other equipment used by the armed forces may be purchased after the war for use in rural areas.

Short courses, designed by educational and research institutions, could be conducted to keep rural practitioners acquainted with the most recent developments in medical science. Scholarships also could be provided for aiding medical students in apprenticeships with experienced country doctors.

The expansion of public health departments to communities where that service is unavailable at present, is another possibility for improving the health program of the community. The importance of pure water, clean milk from healthy herds, and the control of flies, rats and other rodents, needs emphasis in many farm and town homes. Many organizations in the community can aid in education for better health. From the standpoint of human welfare, no need in the postwar period will be more urgent than the need for good health. It well may be considered an indirect objective of all postwar planning activities and a direct object of effort in rural communities of Kentucky.