IT IS UP TO US

Several young men have been in the office recently to talk with us about the advisability of getting into some line of horticultural work. In every case the problem has been the same. They love working with living plants but can make more money with less training in other work, such as the building trades. In many cases these young men have studied horticultural subjects for years and would like to make this their life work; but as is usually the case, the woman has the last word, and the wives and prospective wives of these men hesitate to consent to a life work which deprives them of many of the ordinary comforts which those of less education and training enjoy.

This situation IS our responsibility, as we can never expect horticulture to find its rightful place unless we can make it attractive for brilliant young men to stay in this work. When the average home owner knows or cares so little about horticultural things that they are willing to let some ignorant but persuasive talking ash-hauler do their horticultural work, there is little encouragement for ambitious young men to spend years in study and practice to be expert gardeners.

It is true that a person with horticulture in his blood and a real Green Thumb will prefer this work regardless of the monetary return, but why should we compel these people to live like a country preacher because of their choice of this kind of work. In the past few years property owners have paid absurdly high prices for such necessary work as tree trimming and removing, and have paid little attention to the qualifications or experience of those doing this work. Is it not the responsibility of every true plant lover to learn to distinguish between high-pressure ash-haulers and trained horticulturists, and make it worth their while for intelligent young men to study this work. If horticulture is given its proper place as a profession our colleges will be compelled to offer suitable courses in this subject.

The final benefit, after all, will go right back to the home owners, as the really trained and experienced horticulturist will save their clients many thousands of dollars in preventing unavoidable damage and in the increased vigor and beauty of their plants.

—George W. Kelly.
shrub. Usually it is better to remove a part of the old stems. This stimulates the shrub and gives a good "body" to it. Splendid examples of correct pruning are to be seen along Denver's Seventh Avenue Parkway. Don't round off the top as the army barber does when giving a burr hair cut. The character and bloom are both lost that way. If you don't know whether the shrub blooms on old wood or new wood, play safe by postponing your pruning until immediately after the bloom is over. Don't be afraid to dig up and throw away a tree that is too large, or is deformed, or a shrub that is leggy and scrappy, or injuring others by reason of its too great size. This also furnishes fire-wood for the grate, and fire-wood is very difficult to acquire now. (See index in November, 1946 Green Thumb for articles on pruning.)

Spruce trees and all erect Junipers (usually called "Cedars") should be sprayed with lime-sulphur while dormant, (early April), and American Elms should also be given a spray. Examine the Dogwoods, and if they show black patches in branch crotches, give them a dormant spray too. Aphis will emerge from those clusters later.

Spade up the annual beds, put in some old manure, and cut all tops off the perennials, dividing the roots when they show signs of getting too old and large. When all this has been done, and the season's planting too, you can coast—for a short while. With the first really sizzling hot day in June, however, every aphis and red-spider who was not caught by the dormant spray will start sucking cedar sap—and propagating. If you didn't use a dormant spray, in about three days the whole inside of your cedar will begin to drop to the ground and it will have the unhealthy, brown appearance typical of insect infestation. Don't wait for this to happen. Spray, or better still, have a professional with a power spray douse the cedars with soap and nicotine the first day the thermometer reaches 90. Do this even if you used a dormant spray in the spring. You probably didn't get all of them. (See November, 1946, Green Thumb "Dormant Spraying" by Paul Morrow.)

Weeds now start poking their heads out, and they are much easier to eradicate while small. Keep after them until frost!

The summer progresses. Cut the annual blooms, to keep them blooming. As perennials go to seed, cut off the seed pods. "Setting" seed takes a good deal out of a plant.

In late July, or early August, divide all iris plants that have been in three years. Weed all flower beds and shrub borders. Look over everything for bugs and spray when you find them. Keep the tops of fall blooming perennials like Chrysanthemums "pinch-ed" off to make them compact and bushy and start washing the under side of phlox leaves with a reasonably stiff water spray to keep aphis off. Watch for mildew on the leaves of flowers, spraying with Bordeaux mixture when you find it. Avoid sprinkling flowers; irrigate the soil instead.

If all these practices are continued until frost, you will have had a fine yard and will have acquired considerable health. No yard can be completely satisfactory without a lot of old fashioned, manual labor. As one very wise man said (I have forgotten who), "No one can truly appreciate flowers until he has gotten down on his knees before them."
THE lawn is the foundation of practically all landscaping. Good planting will avoid years of headaches in caring for the lawn, so a few suggestions of what constitutes good lawn making are timely.

All soils should be spaded at least 6 to 8 inches deep; more depth is beneficial. This will avoid some run-off and provides a reservoir for quick absorption of water to such depths that will encourage deeper rooting of the grass plants.

As spading is done, thorough and uniform pulverization of the soil should be accomplished. Working lumps beneath the surface instead of breaking them up is poor practice and will cause a series of problems; such as difficult raking, uneven settling of finished lawns, irregular absorption of water and chemical elements, resulting in increased maintenance and a rough spotty appearance.

Kentucky blue grass has proved itself the most hardy lawn grass in Colorado. With a minimum of care and expense it will produce the most beautiful lawn. (Where more expense and care is not an item, one of the bent grasses may be considered for a more striking effect. See article by Frank Harris in Sept., 1946 issue). This will take lots of abuse and is well suited to Colorado soil and climate. It has given Denver the reputation of having the most beautiful lawns in America. There are many lawn mixtures on the market, but with few exceptions they are not to be compared with or recommended in preference to Kentucky blue grass.

Should I mix white clover with blue grass? It has been my practice for many years to add one pound of white clover to ten pounds of Kentucky blue grass. White clover germinates quickly and provides a nurse crop for the more slowly developing blue grass. Clover being a legume, also helps in another way to establish a dense lawn quickly. After the lawn is well established, white clover can be easily eliminated. However, lawns can be started successfully without white clover by using greater amounts of mulching and more intense care over a longer period of time. Clover also helps to give quicker ground coverage and to hold the soil in place and prevent shifting and tracking by the lawn mower for the first few mowings. This is especially true on slopes and banks. Sometimes such grasses as rye, western wheat and others are used for nurse crops in lawns, but I prefer clover because it can be more easily eliminated when it is no longer wanted.

WHEN TO PLANT

Lawns may be sown from early Spring to late Summer or early Fall. It is sometimes difficult to prevent the surface area from drying out and damaging germination in the hottest part of the summer. Freshly sown lawns are quite often infested with annual weeds. These weeds will be present to a certain extent regardless of the kind of fertilizer used. It is only normal to have weed growth whenever and wherever a seed bed is prepared. For this reason, I prefer seeding a lawn in the latter part of August. Most weed seeds on the surface have germinated by this time and most new weed seeds are not mature enough to germinate. However those seeds that are present will germinate and develop weed seedlings that will soon be cut down by frost, leaving a clean weed-free lawn without a lot of hand labor. I recommend using 1 pound of seed per 100 square feet of lawn.

MAINTENANCE

We shall now consider the lawn well established and ready for routine maintenance. And since it seems that the spirit, or the first warm days of Spring, causes man to come from hibernation and invariably get a rake and start scratching the lawn like it had the hives; for no greater reason than that, we will start the maintenance discussion with, "why rake the lawn?"

Raking is often done for the purpose of aeration. I question if there is any benefit from raking as far as aeration is concerned. If the rake teeth penetrate the soil deep enough to provide adequate aeration, the forward motion of the rake would pull out or seriously disturb a lot of the grass roots. In addition to making the lawn surface irregular and bumpy, I think this practice is injurious to the grass plants. It also removes the organic residue from the ground surface that has become a protective mulch. This mulch if left alone will provide fertilizer, correct physical impurities of the soil, retard run-off of water and prevent evaporation of moisture.
If the lawn is mowed to the correct height, the appearance of this mulching will never be offensive. Raking is also done to remove surplus barnyard manures, litter and debris. In this it has its greatest justification. I recommend that this be done lightly and without too much disturbance to the grass. If the brown tips of overwintering grass are objectional you will find the lawn mower with the catcher attached at the time spring growth starts, very effective in removing it. Serious matting and crust may be helped by raking. However in most cases spiking or forking will be more beneficial. Raking is also done for crabgrass control. There again the benefits of such efforts are quite limited.

**FERTILIZING**

The question of when, how, how much and what kind of fertilizer to use, has been one of considerable controversy; and I am sure that the last word has not been said. There are two definite fields of thought. The inorganic and the organic, often referred to as Commercial (chemical) and Barnyard fertilizer.

Over a period of several years, I have arraigned myself with both groups; worked stubbornly to prove my contentions, until my own experiments put me on the fence. The outcome of the experiments have convinced me that the best results are obtained by a wise combination of the two.

The chemical fertilizers have an advantage in so far as their analysis can be adjusted to fit special needs, such as soil deficiencies and meeting the requirements of certain plants. But due to the lack of soil organisms and humus in chemicals, lawns that are continually maintained with them are very likely to become hard, less susceptible and retentive to water. As the humus content of the soil gradually lessens, the waterholding capacities and aeration possibilities are so drastically reduced, especially where there is any amount of traffic, to cause packing, so that oxidization of fertilizing elements and normal function of soil organisms becomes most difficult. This condition usually results in the gradual thinning and reduction in growth, and less resistance to general abuse and drought.

Organic or barnyard fertilizers are still the most commonly used, and come more close to filling the job in an arid community. In dry climates, the foliage production on plants is comparatively light. This causes the annual deposits of vegetable matter in our soils during the many years of their development to be less than is necessary for good gardening soils. Because of this, organic manures should be a liberal part of any fertilizing program in the Rocky Mountain area.

The chemical content of organic manures is not high enough in some elements to correct certain soil deficiencies that impair the best growth of plants. So, at the present time, the nearest approach to correct fertilizing, is the combined use of both chemical and organic materials.

The availability of the fertilizing elements in organic manures, depends upon the process of decomposition. Further breakdown of manures spread on lawns can only take place after the fertilizer and soil has made such contact and absorbed sufficient moisture to enable decomposing bacteria to function normally. For this reason organic fertilizer should be put on well ahead of the growing season. Fall or mid-winter is very good.

**HOW MUCH FERTILIZER**

The amount of fertilizer to be applied is of prime importance. Heavy applications do not supply light washing elements, and is likely to last longer, but has dangerous possibilities. It is a common practice to fertilize heavily and only once every several years. This may be sound economically, but is not a good fertilizing program. Heavy applications of fertilizer provide the necessary mulch to form an excellent seed bed to germinate obnoxious weed seeds. Too much organic material is an attraction for night crawlers. Serious burning may also result from too generous amounts of fertilizer of either the chemical or organic.

Light applications spread more frequently, will produce cleaner, more uniform growth and without the offensive appearance that you get with larger quantities.

The soil condition quite often varies, causing spotty lawns. It would be well to retain a small amount of fertilizer to treat weak spots and corners where packing may take place.

Chemical fertilizers are readily available to the plant and may be applied during the growing season. I have found it quite satisfactory to divide the recommended amount into three separate applications. Early May, July and August. This removes the flash usually experienced with chemicals and provides a uniform growth throughout the season. This also lessens burning possibilities. As most soils in this area are low in phosphorus, commercial fertilizers with a high phosphorus content should be selected.

The best equipment for spreading chemical fertilizers that I have found is a seeder used on tarms for sowing small seed and grain, called Cyclone Seeder. This gadget is very inexpensive and can be purchased from most all seed stores. This seeder will enable you to reduce the spread so thin that you may crisscross the area in two or more directions in getting on the desired amount. This helps to improve the uniformity of the spread.

It is quite difficult to fix quantities of fertilizer to use on a given area as the analysis of different fertilizers vary. Also the need of lawns are not the same. The best guide for fertilizer quantities is the rate of growth of the grass.

I would like to emphasize the importance of well rotted manures, well past the stage that would be attractive to night crawlers. The presence of new weeds shortly after fertilizing is not always a true indication that the weeds came from the fertilizer but that the seed had been deposited on the lawn by wind or otherwise before the lawn was spread with fertilizer which supplied the necessary coverage for germination.

**MOWING**

The height and frequency of mowing gets too little consideration. Short mowing looks more groomed, but as the foliage constitutes the digestive system of all plants, it is easy to overdo. On the other hand when the grass gets very long, jointing, seed development and maturity of the plant takes place. Long grass does not stool or send up additional shoots from its roots. This causes the lawn to become thin and unattractive. So it seems that a happy medium is the best course to pursue. I like to set the lawn mower to cut at about
1½ inches. This height is sufficient to shade the ground thus helping to prevent evaporation of moisture, looks well groomed and hides the clippings very satisfactorily. Blue grass does not joint or form seed at this height. Lawns mowed at 1½ inches develop a very dense turf and are resistant to infestation of weeds. When lawns are continually mowed short, heavier feeding of readily available fertilizers will be necessary to maintain a vigorous condition.

How often one should mow the lawn varies with different lawns and also as to the time of year. Lawns where the clippings are being dropped, mowing should be done at least every five days and in some cases twice a week. Where catchers are used a longer time between mowing may be allowed.

If grass gets too tall, the bottom becomes bleached and tender. This causes the lawn to have a yellowish cast when mowed. When clippings are to be dropped, they should not be longer than two-thirds of the length of the remaining grass. This will permit the clippings to fall between the standing grass blades and disappear from sight more readily than long clippings which often gives the appearance of a freshly mown hayfield.

The dropping of clippings has several values. The clippings form mulching that retards run-off water, slows up evaporation of moisture and prevents drying and hardening of the soil. As the clippings decay fertility and humus is added to the soil. This is also an aid to the increase and function of soil organisms. Where the dropping of clippings is objectionable, these benefits may be obtained by the application of organic fertilizer. One other benefit derived from dropping the clippings is the time saved. It takes only about half as much time to mow a given area without the catcher.

WATERING

The ease of turning on the hose and letting it run, the relative inexpensive of water and the varying moisture conditions under which plant life develops create a combination of factors that permit us to irrigate our lawns without much concern. While blue grass will grow under a wide range of rainfall or moisture in the soil there is a place in that range where blue grass will flourish and the undesirables have less opportunity to establish themselves. It has been my observation that each form of plant life develops best at some particular moisture content level. Some plants thrive over a wider range than others; blue grass enjoys one of the widest ranges of our ornamental plants. Once blue grass is well established, it is possible to regulate the application of water to the full advantage to the lawn and at the same time eliminate most all obnoxious growth. There are two very important factors to consider in the application of water on these lawns; the quantity of water applied and the frequency of applications. The quantity of water to apply (which is usually determined by the length of time a hose is permitted to run on any one setting) should be sufficient to thoroughly saturate the soil for 5 or 6 inches. The amount of water and the time required to do this varies on different soils. This may be accomplished in ten minutes on a very sandy soil, while the heaviest of clay may require an hour. This depth of penetration is necessary to obtain deep rooting of the grass plants which assures the plants of a greater range in which to obtain their likelihood and protect them against wilting when hot days arrive. In hot weather the bottom 3 inches of the first 6 inches of moist soil, is worth twice as much as the top three. In order for grass plants to benefit from the deep moisture, deep irrigation must be practiced constantly. Grass roots cannot adjust themselves from the surface area to a greater depth in a short time.

Water starting to run off the surface of banks and heavy clay soils is quite often taken as an indication that the soil is thoroughly saturated. This assumption is erroneous. Run-off on dry lawns after a few minutes sprinkling indicates a very slow absorption or too fast an application. Spiking and spreading organic mulch will aid absorption. A wider range sprinkler that will distribute the same volume of water over a greater area is most effective in preventing run-off on banks and heavy soil, merely merely turning the spigot down does not change the water volume and surface area ratio.

Analysis of irrigation run-off shows that a great amount of soil fertility is lost in addition to the waste of water.

How often should I water my lawn? I wish I could tell you, but let's consider a few of the factors that might help determine how often irrigation should be done. Irrigation is to replenish the loss of water. This loss takes place through evaporation and leaching. Evaporation is rapid in hot periods and slow in cold weather. It is retarded by mulching and is influenced by height of the grass. Heavy soils warm up slower which makes the evaporation rate lower than on light soils. Also such losses are much less three inches beneath the surface than on the top. Leaching is much slower on clays and soils with a high humus content.

This all adds up to one thing. Lawns on heavy soils, those that are mulched and those that are irrigated deeply will not have to be watered as often as those on light soils or those that are sprinkled lightly. Lawns in this first classification will go through the hottest periods of our summer season with two irrigations per week without any apparent distress. A longer period of time between irrigations may be used when temperatures are lower.

Then the exposure of a given section of lawn has a great deal to do with the amount of water required. Lawns on the south of a building or on a south slope may require ten times the amount of water that a section on the north of a building would require.

The only sure way to know whether your lawn is dry or wet is to test it out frequently with some such tool as a screwdriver. If it can be pushed into the soil easily to a depth of six inches the soil is probably sufficiently moist.

There is another very important point to remember about lawn irrigation. The less often water has to be applied to the surface, the fewer obnoxious weeds you will have. Practically all lawn weeds are established from seed. Which means that favorable seeding conditions would encourage a greater number of such plants. Irrigations that are frequent enough to keep the surface wet will permit and encourage the germination and establishment of all weed and crabgrass seed that is deposited on the lawn. If sufficient time is allowed between irrigations to permit the immediate surface to become dry, most seeds will die in germination.
OUR NATIVE FLAGSTONE FITS IN COLORADO LANDSCAPE CONSTRUCTION
By ANDREW LARSON

In this region, we have the native flagstone in both red and gray. The red flagstone comes from Lyons, Colorado, while the gray flagstone is found in the Loveland and Ft. Collins districts.

Flagstone is not a new type of construction material, as its uses date back to Denver’s earliest history. Its principal use then was for the construction of public walks and curbs. In later years this use has given way to concrete, which gives better service for that purpose. However, when it comes to garden construction, flagstone excels most any material, from the standpoint of sturdy and lasting construction, as well as artistic effect. It lends itself to many garden structures, but its principal uses are as follows: Retaining Walls, Grills and Fireplaces; Terrace and Pergola Floors; Entrance and Garden Walls, Stepping Stones, Coping for various types of walls, Driveway Curbings and Garden Pools.

Retaining Walls constructed of flagstone will withstand the disintegrating effect caused by soil alkalinity, while most any other kind of materials will soon show deterioration. There are several ways or types of construction used in building these walls. The most commonly used is what may be called veneer type. That is, using strips of flagstone four or five inches thick, then back the same up with concrete to reach the bearing strength of the retaining wall. As a rule, a total wall thickness of ten to twelve inches will suffice, then place a coping on top, wide enough to cover the entire thickness of the wall. For the best effect, the coping should be about two inches in thickness.

The stones used in this kind of wall may be either ripped or cut. If ripped stones are used, the mortar should be raked, that is, the mortar joints should be held back about one inch from the wall surface. The mortar joints are then not very visible, instead a dark shadow appears, lending a less severe structural effect. When cut stones are used, the joints should be flush and have a smooth finish.

Another type of construction is the dry wall, where flagstones are laid the full width of the wall, with soil joints, now and then, creating a soil pocket for planting purposes. However, in this semi-arid region rock wall plantings do not always prove successful, due to drying of the plant during the dormant season. For best effect, flagstone retaining walls should never be of any great height, 36 inches to 40 inches should be considered as a maximum. If the differences in the negotiable grade is greater, and necessary space available, a better effect is obtained by erecting two walls. The lowest wall should be of a greater height than the top wall.

Grills and Fireplaces can be successfully constructed of flagstone. This type of construction requires cut stones with full and finished joints. In these structures, the fire-place and grills should be lined with firebricks. The flues do not necessarily need...
The designs depend very much on size, use and cost. Generally, it is a good practice to pour the joints before the base is set firmly. When flagstone is set on a soil base, the stones should be of stable size, not less than one and one-half inch in thickness. If the joints are seeded with lawn grasses, the stones should be set very close. Such spacing of stones prevents heaving, caused by too many grass roots between the stones. Stones for this purpose may be irregularly shaped or cut into various types of rectangular patterns.

Entrance and Garden Walls are similar in construction to Terraces.

Flagstones are one of the best materials for copings of brick, etc. They have many varieties, and can be set in concrete or soil base. Often the base is poured, rather than the stones are set when poured, rather than the joints are set. The stones are apt to crack and soon deteriorate. It is also a good practice to pour the joints before the base is set firmly. When flagstone is set on a soil base, the stones should be of stable size, not less than one and one-half inch in thickness. If the joints are seeded with lawn grasses, the stones should be set very close. Such spacing of stones prevents heaving, caused by too many grass roots between the stones. Stones for this purpose may be irregularly shaped or cut into various types of rectangular patterns.

Extensive use of flagstone for walls, steps, walks and platforms at home of Dr. and Mrs. R. O. Smith, Arvada. Unity in design has been achieved by building fireplace chimney and front porch of the same material.
Irregular pattern flagstone used to border pool, pave platform and construct distinctive garden entrance at home of Mr. and Mrs. Marvin Watson, Wheatridge.

White flagstone used to cap a masonry wall on grounds of Mr. and Mrs. James H. Dewson, Denver.

Walk out some moonlit night and look at the trees against the sky. Make a game of trying to identify the various kinds of trees by their silhouettes. You will find that each tree has its own individual habit of growth.

Now is the time of year that we appreciate the varying colors of bark and twig found in some trees and shrubs. The Redwig dogwood is very attractive, the Golden Willow makes splashes of yellow and the Bolleana poplars make a good contrast with their silvery green bark. There is even an interesting variation in the more somber grays and browns.
FARM FORESTRY PAYS
Extract from an article by John F. Preston, in "The Land."

"Getting farmers to accept wood as a farm crop and the woodland as an integral part of the farm, is necessarily a slow process. But we are making progress with 'green agriculture'. We will soon begin to note progress in 'forest agriculture'. It is no less a job than building into the tradition of farming the idea that a farmer can use and develop and make an income from the forest that his forebears tried so hard to get rid of. Farming the woodland can be done with less physical effort, with less risk of loss of the soil itself than is involved in clean-tilled crops, and the farmer has the permanent protective influence of woodlands on croplands. To assure the permanence of American agriculture, as well as the well being of farmers, farm forestry must find its place in farm economy. Wood must be recognized and grown as one of the farm crops on lands dedicated to that use."

—Guy Irving Burch, in THE LAND.

LANDSCAPE DESIGN OF THE COUNTRY HOME
"The Plan's The Thing"
By Ralph B. Riclefs, of the Kansas Landscape and Nursery Co., Salina, Kansas.

The first requirement for old homes or new alike is to have a plan for the grounds—a program to be carried out for functional as well as attractive development of the farmstead.

Planning the farm home differs but little from that of the city home. Space saving may be so important, but often the arrangement of the various parts of the farm grounds—for example, the grouping for convenience of barns, windbreaks and yards may be more important than the several related parts of a town yard.

Certainly the surroundings of the country home need be none less beautiful and inviting than those of the city lot. Breadth, informality and simplicity are characteristics of the country side. Thus, these factors combined with neatness should mark the appearance of the country home.

Don't make the mistake of just following a "hit and miss" landscape and building up the grounds "piecemeal" without any thought or purpose before they are planned. Instead, plan what is to be done and what arrangement serves the best purpose; using proper foresight along with your general farm planning and improvement program.

A correct plan, embracing the whole program for the farm grounds, is needed at the outset, whether it can be put into execution at once, or is completed over a period of years. Often it is just as well to extend the planting over several seasons, following a logical sequence in which the various units are developed.

With a well-thought-out "master plan", the convenient and economical budget system of landscaping may be followed. The grounds will develop as the plants grow into beauty and usefulness along with the farm owner's enthusiasm.
MORE PLANTS FOR THE PLAINS

By GEORGE W. KELLY

THE Colorado Forestry and Horticulture Association aims to be of service to all parts of the state. A large proportion of the state is included in the Great Plains region. This area will probably never support a large population, yet we feel that with improved methods of culture, the restricted rainfall can support many more than at present. What is much more important is that those who now live there can develop systems which will enable them to establish more pleasant homes and communities. We have recently made several trips through this area to supplement previous knowledge of the conditions with later data. In general, the climatic conditions are about the same over the whole Central Plains region: roughly that area between the foothills, Central Kansas, the Arkansas valley and the Nebraska line.

Of course the first consideration here must be to obtain a “living” from the soil. Too little attention has been given in the past to making homes which were worth “living for”. There has been very largely a feeling of “stick around until we make a bumper crop and then get out”. We must promote means of correcting this attitude and establishing permanent homes here in which our children and grandchildren will be happy to live.

Agriculture is concerned in making this “living”, but nothing will help to make this country worth “living in” as much as horticulture: trees, shrubs, fruit and flowers. Much the same climatic conditions affect both agriculture and horticulture, and as more has been done towards solving the agricultural problems of the Great Plains we will start from there in developing plans for horticultural improvement.

The Field Station of the U.S. Department of Agriculture at Akron, Colorado, has been experimenting with methods of getting the maximum crops from this region for some thirty-seven years so they have been able to develop some theories of the most efficient methods of cultivation. We find its recent publication, identified as Circular No. 700, issued in May 1944, by J.F. Brandon and O.R. Mathews, confirming excellently our own observed conclusions about plains agricultural and horticultural practices.

It has long been thought by many who have studied the plains agricultural problem that the type of agriculture best suited to the area as a whole is livestock raising supplemented by the production of food and feed crops. The emphasis on crop production, however, may vary widely, and there are many successful farmers who rely chiefly on grain. This is our view and is confirmed by conclusions in the mentioned U.S. circular.

PRECIPITATION

It has also been recognized that PRECIPITATION IS THE GREATEST SINGLE FACTOR IN CROP PRODUCTION in the western part of the Central Great Plains. However this is the first time that the west Central Plains have had a careful analysis of the distribution and intensity of its rainfall over so long a period. It allows some logical conclusions. In this area insufficient soil moisture regularly limits crop yields.

This analysis of the station rainfall from 1908 to 1938 shows that 29.7 percent of the total precipitation falls in rains of one inch or more. This is the precipitation most likely to be lost by runoff, and while it may not be possible to hold all of it on the surface until it can infiltrate into the soil, the importance of preventing avoidable losses is apparent. Thus the PREVENTING OF RUNOFF, which is largely controllable, IS ONE OF THE GREATEST FACTORS IN CROP PRODUCTION in the West Central Great Plains area. The average annual precipitation for the entire thirty-one year period at Akron was 17.9 inches.

WIND EROSION

Wind erosion has been acute in the area in years past, and certain facts about this problem need to be emphasized. All agree that after soil starts blowing on a field it cannot be arrested until the surface is severely roughened or is covered with growing crops or weeds. It must be prevented, however, and can be by adequate cover of dead or dormant vegetative matter, and generally by suitable cultivation. Management to prevent or control soil blowing, this circular points out, is a necessary part of Great Plains rotations. If fallowed land seeded to winter wheat should not grow a protective cover that fall, soil blowing is almost sure to be encountered. Thus in known troublesome areas winter wheat on fallow should not occupy too large a percentage of the farm area. It is just possible that the weather of the Plains area flows in cycles, and that once proven by the Plains research units, farmers can be advised when they are less likely to obtain good protective cover of winter wheat in their large fallow areas.

FALLOW

In the past ten years there have been many methods and systems of fallow maintenance advanced before Plains farming audiences. This U.S. circular
based on findings at the Akron, Colorado U.S. station, seems to bring order out of chaos by listing four major requirements to be met in maintaining good fallow for winter wheat in this general region: (1) To enable precipitation to enter the soil; (2) To conserve this soil moisture; (3) to have the top horizon of the stored moisture near enough the surface by fall to permit seed to germinate and; (4) to have a surface maximum resistant to soil blowing. Timeliness in performing all necessary cultivations, and use of implements that leave the surface not only free of weeds but open and cloddy are of primary importance in attaining the first two objectives. Cultivation during the forepart of the fallow season with implements that form small basins is recommended. The use of shallow working implements during the latter part of the fallow season is necessary for the third objective. The use of implements that leave the surface cloddy and with trash and debris on top in cultivation to control weeds, and the use of furrow seeding machines meet the fourth requirement.

CULTIVATION

In their cultural investigation work at Akron over this 30 year period it was conclusively shown that the purpose of all Great Plains cultivation is to control weeds, to keep the surface in condition to resist soil blowing, to permit ready penetration of rainfall and to have a suitable seed bed. Deeper or more frequent cultivation than is necessary to obtain these objectives serves no useful purpose and may do real damage by fining the surface so as to induce soil blowing danger.

ROTATIONS

Rotations naturally should include the crops best adapted to a region, and these should be grown in an orderly plan that permits most economical production. Rotations, besides systematizing the farm activities, permit crops to follow each other in sequence that take advantage of existing moisture conditions.

LIVESTOCK

After 30 years of investigation this Akron Agricultural unit concludes that any well diversified rotation for the section presupposes livestock and an acreage of native or seeded grass for pasture. The Colorado Agricultural Experiment Station recommends that on the hard lands at least 25% of the farm unit be in sod lands with lower productivity and that the percentage be increasingly higher with greater sandiness of soil. The percentage of sod should be higher on lands with lower productivity ratings. Naturally the quantities of bulky feeds that must be grown depend upon the extent to which they are supplemented with pasture... Over much of eastern Colorado the main dependence of the farmer should be on livestock unless crop-weather cycles are proven, when a different pattern of farming may be advisable over each type of cycle.

CONTOUR AND STRIP CROPPING

Fields can generally be arranged so that contour cultivation and strip cropping can be followed. A rotation involving strip cropping may sound very complicated when described, but it is relatively simple in field operation. Effort should be made to incorporate such a practice if it can be done without increasing insect damage and if the direction of the strips does not parallel that of the more severe winds. This excellent circular points out that THE REGION NEEDS TO BECOME EXTREMELY CONSCIOUS OF THE NECESSITY FOR RETAINING AS MUCH AS POSSIBLE OF THE MEAGER RAINFALL IN THE SOIL. RAINFALL STORED IN THE SOIL IS THE LIFEBLOOD OF SUCCESSFUL GREAT PLAINS AGRICULTURE.

Other data that this bulletin brings out are the fact that there are usually quite a number of days in the summer when the temperature goes above 100, that there is normally a high evaporation rate, that the winter temperature frequently goes well below zero, that the average frost free period is 144 days, and that there is considerable variation in cultural practices on different types of soil.

There are also soil conditions which make the raising of certain plants difficult. Much of this area has an excess of alkaline salts in the soil which induce chlorosis in susceptible plants such as spireas, maples and barberries.

Here then we have a pretty good picture of climatic conditions and recommended cultural practices. These general recommendations will apply, in modified forms, to all horticultural operations. Unfortunately horticultural investigations have not been a major field of investigation at the Akron unit, either through the Federal Government or through Colorado State College cooperation. The station, however, has several good horticultural and forest variety survival and production studies.

MORE PLANTS FOR THE PLAINS

So, starting from here, what are the necessary steps in the development of improved and increased horticulture?

1. A systematic plan for each home showing where various trees, shrubs, flowers are needed to provide shade, wind protection, screening, firewood, posts or beautification.

2. Plant first those trees, shrubs, flowers that have shown a high resistance to the Great Plains climatic conditions. See list below.

3. Gradually add plants of better kinds but less hardness, in the protection of the established older plants. Also arrange to give new plants extra care, such as watering, shading and windbreaks.

4. Conserve the greatest proportion possible of the rain and snow that falls, by proper preparation of the soil, proper cultivation, effective removal of competing weeds, contour cultivation, sodding and ditching to divert runoff to plantings.

5. Construction of dams in suitable places to catch runoff and enable it to be used where needed later.

6. Development of wells and pumps to get the maximum benefit from any available underground water.

It is evident that quite a lot of planting has been done around homes in this area in the last few years, but there are still many places with no trees, and a large proportion could well grow many more plants than they now have, and also a greater variety. We
have made an effort to locate those progressive residents who have gone a little ahead of their neighbors and have succeeded in growing many things that the average resident does not have. Through these pioneers we can demonstrate that others can also raise a greater variety of plants if they care to give the thought and effort to it. We are also sure that any effort and expense toward this end will not only bring a proportionate reward in the satisfaction of more livable homes, but in actual financial gain. A more pleasant home is sure to give the inspiration to work harder and more efficiently on the pay crops.

**HARDY “FOOLPROOF” PLANT TO START WITH**

**TREES—**  
- Siberian (Chinese) Elm  
- Hackberry  
- American Elm  
- Native Cottonwood  
  (Good where there is an underground watertable)  
- Boxelder (Subject to bug injury)  
- Honeylocust  
- Russianolive  
- Green Ash (Short lived)  
- Mulberry (For southern part of Plains area only)

**EVERGREENS—**  
- Ponderosa Pine (Very good)  
- Rocky Mountain Juniper (Very good)  
- Pinyon Pine  
- Limber Pine  
- Austrian Pine  
- Bristlecone Pine  
- Oneseed Juniper

**FRUIT—**  
- Sour Cherries  
- Early Apples  
- Mulberries  
- Sand Cherries  
- Chokecherries  
- Currants

**SHRUBS—**  
- Tamarix Hispida  
- Siberian Peashrub  
- Common Lilac  
- Persian Lilac  
- Vanhouette Spirea  
- Sumac  
- Native Flowering Currant  
- Native Wax Currant  
- Russianolive (Some wintorkill in northern part)  
- Bush Honeysuckle  
- Wild Plum  
- False Indigo  
- Yucca  
- Wild Rose  
- Chokecherry

**ANNUALS—**  
- Zinnas  
- Petunias  
- Marigolds  
- Calendulas  
- Cosmos  
- Portulaca  
- Four o’Clock

**VINES—**  
- Engleman Ivy  
- Native White Clematis  
- Halls Honeysuckle

**PERENNIALS—**  
- Shasta Daisies  
- Iris  
- Sunflower  
- Fall Asters  
- Chrysanthemums  
- Goldenrod  
- Day Lilies  
- Salvia  
- Achillea  
- Saponaria  
- Hollyhocks  
- Flax

**DESIRABLE PLANTS TO ADD LATER**

**TREES—**  
- Black Walnut  
- Willows (Scraggly growth)  
- Soft Maple (Short lived)  
- Kentucky Coffeetree  
- Catalpa (Winter kills in northern part)  
- Carolina Poplar  
- Lombardy Poplar  
- Silver Leaf Poplar  
  (Poplars all must have underground water or surface irrigation).
- Bur Oak  
- Tree of Heaven  
- Linden (Not hardy in northern part)
- Sycamore  
- Bechtel Crab  
  (Need special care)

**FRUIT—**  
- Peach (Hardy only in favored locations)  
- Apricot (Rarely sets fruit)
Apples
Plums
Manchu Cherry
Gooseberries
Everbearing Raspberries
Everbearing Strawberries (Berries must have lots of water)
Buffaloberry

SHRUBS—
Privet
Elderberry
Snowball
Snowberry
Coralberry
 Forsythia
Shrub Roses
Flowering Almond
Flowering Quince
Flowering Plum
Redleaf Plum
(Redosier Dogwood
Leadplant
Buddleia
Japanese Barberry
Mockorange
Hawthorn
Rock Spirea
Althea
Pin Cherry
Hibiscus
Buffaloberry
Redbud

EVERGREENS—
Douglas Fir (In favored locations)
Pfitzer Junipers
Savin Junipers
Mugho Pine (Winter burns in exposed places)
Blue Spruce (Need extra care)
Chinese Arborvitae
(For southern part)

VINES—
Purple Clematis
Goldflame Honeysuckle
Boston Ivy
Climbing Roses
(All above need protection)

PERENNIALS AND BULBS—
Peonies
Phlox
Dahlias
Gladiolus
Lilies
Delphinium
Bleeding Heart
Columbine
Coreopsis
Dianthus
Gaillardia
Goldenglow
Liatris
Monarda
Pentstemon
Poppies
Violas

ANNUALS—
Verbena
Stocks
Salpiglossis
Sweet Peas
Larkspur
Nasturtiums
Nicotiana
Morning Glory (Very good)
Phlox
Asters
Sweet Alyssum
Snapdragon
Calliopsis
Celosia
Centurea

FORREST SURVEY ASSURED

IN the last issue of the GREEN THUMB reference was made, in an article entitled: "FORESTRY ON THE MARCH", to a proposed forest survey. I am sure it will be welcome news to the readers of the Green Thumb that this proposed survey by the Society of American Foresters and the Charles Lathrop Pack Foundation is assured, and will soon become a reality as evidenced in the following quotation from a letter which I have received from Mr. Henry Clepper, Executive Secretary of the Society of American Foresters:

"Doubtless by this date you will think that I have completely forgotten you and our previous conversations about a State forestry survey in Colorado. Following receipt of the Governor's invitation I took the matter up with our steering committee and asked them to approve a survey waiving a contribution of $1,500 from the state. I am delighted to inform you that the committee has approved this recommendation.

The Colorado Forestry and Horticulture Association has just taken out an affiliated membership in the American Horticultural Society, Inc., (821 Washington Loan and Trust Company, Washington 4, D. C.). By virtue of this affiliated membership, all members of our own association are privileged to become members of The American Horticultural Society at $2.00 per year instead of the regular rate of $3.00 per year. All members of The American Horticultural Society receive its splendid magazine, (National Horticultural Magazine), one of the outstanding magazines in the field.

"There is a binding, genial and generous fellowship among the 'growers of living things.' It's a fellowship that has spread with man over the earth—since he discovered that by carefully planting and harvesting crops he could enjoy relative plenty. Left to his own, the Grower is a man of peace, goodwill and friendly understanding."

—George S. Avery, Jr., in Plants and Gardens.
THE LAND

"The land is God's greatest material gift to mankind. It is a fundamental source of food, fiber and fuel. Its right to use such an elemental source of life and development is essential for human welfare.

Land is a very special kind of property. Ownership of land does not give an absolute right to use or abuse, nor is it devoid of social responsibilities. It is in fact a stewardship. It implies the labor of the farmer and the right to use such land tenure and use as to enable the possessor to develop his personality, maintain a decent standard of living for his family and fulfill his social obligations.

At the same time the land steward has a duty to enrich the soil he tills and to hand down to future generations as a thank offering to God, the giver, and as a living inheritance to his children." (From statement of principles by a joint council of religious leaders, as quoted by Eugene Smathers in THE LAND.)

"LIVING MEMORIALS"—BLUE STAR DRIVE

"BLUE STAR DRIVE" a naturalistic planting of dogwood, was conceived by the Garden Club of New Jersey and carried out cooperatively by the State Highway Department, as a tribute to the men and women of New Jersey who served in the Armed Forces of World War II. This type of living memorial has now been adopted by the National Council of State Garden Clubs, to be sponsored in several states by Garden Club Federations, Conservation Groups and Veterans Organizations in cooperation with the State Highway Department.

This Blue Star Drive is to be a coast-to-coast continuous highway, starting near Bangor, Maine, and ending at Tribute Grove near San Francisco in California. It is not proposed to have a continuous planting, but that each state should try to meet the needs most required, such as roadside parks, wayside rest areas, lookouts, bird sanctuaries, arboreums and forests. In other words, each state will develop the type of living memorial best suited to the highway which is allotted for this purpose.

The Colorado Federation of Garden Clubs, Inc., who are sponsoring the Living Memorial—Blue Star Drive in Colorado, hope, together with the help of other organizations mentioned, to carry out this plan on the highway which has been allotted to them by the State Highway Department. They plan having uniform memorial markers which will carry a message properly recognizing those who are being honored. Native trees and materials will be used as much as possible to keep costs within reason.

Past highway plantings will be studied, so we may profit by these experiences to know the locality where trees and shrubs have the best chance of surviving, and also that they are planted in places where it is possible to have them watered. Expert horticulturists are now making exhaustive study of the kinds of material best suited to the varying parts of the proposed route, and we hope to start this work of landscaping in the near future.

In planning this living memorial planting, we must be careful not to obscure any of the many beautiful views of our mountains, but to plant in a way that will add to this beauty. Beyond all else, it is important to remember that what is being created is a Living Memorial of permanent character and lasting beauty. Such memorials cannot be built overnight; they must evolve; they must indeed grow. Slow growth is the way of nature and all true creations.

There is still another service to our land in this project, if our vast network of highways is to be kept free from the blight and decay which follows in the wake of unrestricted development of roadside businesses with indiscriminate advertising along our highways, the capital investment by the States and Federal Government will rapidly depreciate and we will later be faced with a vast task of slum clearance, not in our cities but along our major highways. If we recognize this danger and face it now, it can be a work of prevention.

There is much to be done as we enter our state from Kansas, where mile after mile of countryside is bare and desolate. Here is an unique opportunity for the members of the Colorado Federation of Garden Clubs to demonstrate what can be done in roadside beautification, and I am sure they will rise to the occasion. Then again from Steamboat Springs on through Craig and to the Utah border much the same problem has to be faced. The Blue Star Drive through our state is Highway Route 40.

As we strive to create this Living Memorial to those men and women of our state who served in World War II, they will understand our gratitude and faith in that which they believed in; that we have taken to ourselves their sacrifices, which has given to the world the freedom civilization now shares. This living memorial is a challenge to us to build and create a living and perpetual remembrance worthy of those brave men and women.

Mrs. F. S. Mattocks.
STRAY LEAVES IN THE MARCH WIND

If you have a bush of the Redtwig dogwood in your yard go out now and look in the crotches where small twigs branch off and see if these spots are covered with masses of tiny jet black dots. If so, these are the immature forms of aphids which will come to life at the first flow of sap and begin to feed on the newly unrolling leaves. The leaves immediately roll around them so that hitting them with a poison spray is impossible. Get them now with a dormant spray of lime sulphur or miscible oil. Much this same thing happens to all snowball and many euonymus, though in these cases the immature insects are not easily seen.

While you are examining your shrubs look over the Lilacs, Dogwoods and Cotoneasters for signs of oyster shell scale. These are tiny things about one sixteenth of an inch long and very much resembling miniature oyster shells. Same treatment as above.

And while you are looking for scale examine your American elm trees for the elm scale. These are tiny gray spots in the cracks and joints of the small twigs. If there has been much scale damage the previous year the tree will look black and dirty and small lower limbs will be dead. The maple scale is also coming back to town. There are large woolly masses on the under side of limbs on maple, and sometimes Elm, Honeylocust and other trees. As with so many other things horticultural, the established rules do not always apply to the habits of insects in Colorado. We must insist that our agricultural college is given appropriations so that they are able to make available experts on insects damaging ornamental plants. Eastern states have done so and saved their citizens thousands of dollar in prevented damage.

With so many new houses going up now we need to be more aware than ever of the mistreatment of the soil around new homes. With all the fertilizer in the world, organic or inorganic, you can not entirely correct the damage done from allowing "Contractors soil" to be created. Demand that good top soil be saved, that the worthless dirt from the bottom of the basement excavation not be piled on top of the good soil, that plaster and various building refuse is not left in the yard and that the soil is not puddled by running over with trucks when very wet.

Look over your evergreens, especially the low ones such as Mugo pine and Pfitzer juniper for broken and partly broken limbs from the heavy snow last fall. If not too badly broken many may be braced up until they grow together again. Do not wrap string, wire or tape around the limbs unless it is loosened every few weeks throughout the summer as the plant grows and expands.

Examine your larger evergreens for double tops. The best of these may be left and the others headed back to allow the one selected to develop. Unless it has previously been attended to, chances are there are some broken limbs in your trees. Have these stubs cut off close to the trunk or larger limb.

If much damage is found an expert should be consulted. It will soon be time to move in the new plants that are needed.

As you drive around town notice the many horrible examples of the planting out-of-scale trees in years past. Some of those 'cute little spruces' planted each side of the front walk are now great trees hiding the house and spoiling the views both in and out. To avoid this trouble we have three choices. First, plant for immediate effect and thin out as things get too crowded or large. Second, plant for ultimate effect and let the planting look a little thin for a few years. Third, plant for immediate effect and replace with smaller plants when the first begins to get too large for the spot. For most people the second treatment is the most practical.

What kind of fertilizer shall I put on my lawn? That is a question which can not be answered in a few words. For several years the practice has been to buy whatever was offered and ask no questions as to the price or quality. Now we may again begin to choose and the enthusiasts for commercial and various organic fertilizers all have their pet ideas. Some forms may do more good than others under varying conditions. If your soil was really good before the law was planted you will need little of any kind.

Do you realize that south slopes and areas against south walls may have become very dry since the hose was put away in the fall? Examine these spots and give them some water when there is a good warm day.

If you have gotten a start of green aphid, wooly aphid, mealy bug or scale on your house plants they will have multiplied by now until they are doing a great deal of damage. Look over the plants carefully and if necessary get out the sprayer and declare war on them.

"Winter-kill" may actually be largely fall-kill and spring-kill. Many plants which thrive in Canada can not survive our dry, hot winters and erratic springs. Various broadleaf evergreens so useful in other climates are usually hopeless here because of the winter burning of their leaves.

We are becoming more conscious of the value of humus and mulching. Many advocate mulching entirely rather than cultivating. It is certain that our Rocky Mountain soil usually needs more humus. Great masses of undecayed vegetable matter put into the soil may do damage, but properly composted material will add greatly to the fertility of the soil. Right here the big argument about earthworms and organic fertilizer comes in. It is certain that earthworms need decaying vegetation in the soil to thrive, but just how much good they do is still an argued question. And then how about the lawn alive with night crawlers? There are many sides to this whole question, but as in most things we must avoid going off at too great a tangent until we are pretty sure of a sound basis for our belief.

Bolleana poplar trees are almost a thing of the past around the older communities. Nothing has been found to anywhere near take their place, but with all the blights and borers that attack them it is an almost hopeless fight to keep them. Then they are such rank feeders that if they do thrive nothing else in your, or your neighbor's yard does well.
ENGEHEM ANN SPROUEE—Photo by U. S. Forest Service