

EXTENSION BULLETIN 199

1949

LANDSCAPING — THE — HOME GROUNDS



MICHIGAN STATE COLLEGE
COOPERATIVE EXTENSION SERVICE
EAST LANSING



It is the common ideal of home owners to have attractive and well arranged home surroundings. A beautiful landscape is a source of inspiration for the finer and better emotions of life. Beautiful trees, shrubs, lawns, and flowers surrounding one's abode are a source of human pleasure and satisfaction. They are such a desirable part of an ideal home property as to be worthy of much effort to attain them; man has not been able in all the developments of the modern city to discover an adequate substitute.

*First printing Feb. 1918 No. 281 Exp. Sta.
Second printing Sept. 1929 No. 281 Exp. Sta.
Third printing Nov. 1933 No. 281 Exp. Sta.
Fourth printing May 1939 No. 199 Ext. Bull.*

*Fifth printing June 1940 No. 199 Ext. Bull.
First Revision Feb. 1946 No. 199 Ext. Bull.
Second printing of First Revision Nov. 1949 No. 199 Ext. Bull.*

LANDSCAPING THE HOME GROUNDS

By C. P. HALLIGAN¹

Beautiful home grounds are a measure of good taste, of pride of ownership, and enjoyment of a beautiful environment. The use of the land about the house and its adaptability for living purposes are largely determined by the efficiency of its design and development. The problem of the home grounds is therefore that of composing its several parts to serve best the practical requirements and to do so in a pleasing and sightly way.

Most conditions confronted in this problem are common to the resident of the city, suburb, and the country. In the city or suburb there is usually a greater limitation in the selection of a building site and in the space available for development. In the rural districts, there are other limitations, such as the amount of capital available for development and of labor for maintenance. Most of the problems and practices, however, are common to the properties of any residential section.

THE HOUSE SITE

The development of a beautiful grounds about the home begins with the consideration of the site for the house. An appreciation of the important factors concerned will assist one in appraising the relative fitness of different sites for the development of a new home as well as of adjusting the arrangement and development of a grounds already built upon.

The location selected for a house should first of all be sightly; that is, the location should be a pleasing spot for a home. This implies that the site should be somewhat higher than its surroundings, with

¹Retired. Former head of Department of Landscape Architecture.



Fig. 1. The selection of a slightly spot for the house is the first important step in the development of a beautiful home grounds.²

plenty of light and pleasing views or scenes available from it. A beautiful vista of a distant lake or river, or a picturesque valley, or even a large expanse of landscape with its changing seasonal effects will enhance the enjoyableness of the place without adding to the cost of construction. Pleasing landscape vistas tend to make pleasing home grounds.

In the town or city, the consideration of the landscape beauty of the neighborhood is important in making a choice of a building site. The area available for beautification about the town house is often so small that the appearance of neighboring developments is sometimes of greater importance in measuring the desirability of a lot for a home than the quality of its own development.

Exposure of a building site is also an important consideration. A bountiful supply of sunlight makes a dwelling bright, cheerful, and attractive, and exercises a beneficial influence in maintaining healthfulness. Sunlight is particularly welcome during the winter. An ideal site possesses a good exposure to the south so that the more important rooms of the house may be placed upon that side to obtain the most sunlight during the winter. A site that is more or less protected from

²Most of the pictures in this bulletin are of grounds that were planned and planted with the assistance of O. I. Gregg, Extension Specialist in Landscape Architecture (retired).

the north and west with an open exposure to the south and east is most desirable. Sometimes a site sheltered from the north and west by a hill, woods, or other natural feature may be available which, if selected as a site, would compose a sunlit, slightly, pleasant spot for a home.

A slight knoll generally makes an ideal site for a building. If the land is level, a similar effect may be obtained by raising the grade line of the foundation above the original grade and filling up to it with the excavation material from the basement. The house should at least appear to be situated higher than the road.

PLAN

The planning of the home surroundings should begin at the time of the choice of the lot and of the selection of the house site. The planning of the house and grounds should not be considered as separate entities, because in their development the relation of one to the other is so intimate that they should be planned together. There should be definite relationships between the rooms of the house and the features of the lawn and garden, the exposures and vistas from the rooms, the space relations of the lawn areas, and the grade elevations; a consideration of all these things helps to determine the suitability of any particular site and the proper location and orientation of the house



Fig. 2. A slight knoll generally makes an ideal site for a house.



Fig. 3. The house should be situated well back from the road to produce a most pleasing effect.

upon it. After the house is built it usually is impossible to allocate properly the landscape accompaniments that help to make the home most enjoyable.

The house site or building lot must be apportioned to different uses. Usually the three important units into which each home property naturally divides itself are the entrance division or street-front area, the living division, and the service division.

The proper space relations of these divisions, the most convenient location, the desired form, and the correlation of them to their related division of the house must be efficiently provided for as a part of the general plan. Their detailed treatment must be considered in reference to other requirements, such as of walks and drive, drainage, grading and accessory features.

In considering the general plan, it has been said that one should endeavor to attain a close co-ordination of the rooms to the landscape areas supplementing them. Just as the entrance walks and drive commonly lead through the entrance division of the property to the entrance division of the house or front doorway, so in a similar way the service area of the house should be in close relationship to the service

area of the grounds, and the living division of the house properly correlated with the living division of the grounds. It is usually most desirable on the town or suburban lot to develop what in former years was simply the rear yard in a living division lawn and flower garden area to be freely used by the family. To serve best in this way, such a development should be overlooked from the living division of the house and possess access to it from the living room by an intervening living-porch or terrace.

It is likewise desirable to consider the orientation of the house in reference to the arrangement of the rooms. An ideal amount of sunlight in each room is hardly possible. Rooms with windows on the north side of the house will have but little sunlight, especially during the winter months when a bountiful supply is most desirable. It is usually a good practice to arrange the rooms so that the dining and living rooms will be the ones most favored by sunlight by placing them with their windows on the south, south-east, and south-west parts of the house. Due consideration must likewise be given to the location of nearby buildings, trees, and other developments on adjacent lots.

Thus the floor plan of the house should vary with the direction that the lot and house face, and the location of the house upon the lot should likewise vary with these factors. The house to be built upon a lot facing north should be placed closer to the street than otherwise, to leave ample room in the back for a living division of the grounds to be overlooked by the dining and living rooms (which should be in the back or south side of the house). In a similar way on a lot extending east and west although the living division of the grounds will by necessity of space still be placed on the back of the lot, the important rooms of the house should be along the south and east sides. Therefore, an ample open space of lawn area will be more valuable between the house and lot boundary on the south side than along the north one. Thus only by one's working these problems of house plan and lot plan out together can the best results be attained.

DIVISIONS OF GROUNDS

A home grounds may be considered as being composed of divisions, each of which commonly serve definite functions. The more important of these divisions in relation to their functions are the entrance division, the service division, and the living division. Each should be developed in direct relation to these functions but blended har-

moniously to its neighboring areas to constitute a pleasant effect of the whole.

The entrance division usually includes the front lawn, the entrance drive, and walks. That generally is the portion of the property which the public sees from the highway and from which visitors receive their first impression of the place. The general appearance of this division should be trim and tidy, simple, dignified, hospitable, and pleasing. An ample front lawn area, rising gracefully toward the house, bordered by trees and shrubs, and well maintained, tends to give this desirable effect.

The service division is usually that portion of the back yard required for performing the necessary but often unsightly requirements of a dwelling. It is necessarily in close relationship with what may be considered the service section of the house and should provide an entrance and exit to the service division of the house and to the garage. A convenient and well-planned laundry yard for drying clothes and for such other functions as are needed about a dwelling should be included. The vegetable garden may be included in this division or located directly adjoining. The unsightly appearance of many back



Fig. 4. Foundation plantings should be low about the town house where the proportions of the house are pleasing and there is no high foundation to screen.

yards is often due to a lack of arrangement of the service division to serve conveniently and efficiently the necessary functions.

The living division may be considered as that portion of the grounds where the family may enjoy out-of-doors the privacy of family life in a most pleasing environment without being in full view of the service division, of the neighbors, or of every passerby upon the highway. It should be in direct communication with the living-room, terrace, or living porch, and be developed informally as a spacious lawn area bounded by groups and masses of shrubs and flowers and sheltered by trees, or as a formal garden.

Upon many grounds, the back yard must serve the functions of both the service and living divisions. It is the only available area for an outdoor living room and also often must include an area for the drying of clothes, the garage, and similar requirements. Usually the boundaries of this area should be heavily planted with shrubs to screen out the obtrusiveness of neighboring unsightly developments.

Under such conditions, the owner may plan a lawn area bounded by groups and masses of hardy shrubs and trees, with flowering perennials and annuals arranged in the foreground of such plantings.

Upon the town lot the back yard may likewise be developed into a living division. How much prettier such back yards would appear if developed into effective formal or informal gardens! How much more use and enjoyment would be obtained from them than is available from an undeveloped back yard!

A study of the general arrangement and coordination of these divisions is the first step in the development of a home grounds. Such a study answers the question as to what purposes the home grounds are to serve and what general arrangements of the grounds will serve these purposes in the most convenient and pleasing manner.

GRADING

There is usually more or less grading to be done before seeding and planting. In determining the grades, it is well to remember the fundamental objects of grading—which are to produce a pleasing setting for the house, to provide surface drainage away from the building and for every portion of the grounds, and to smooth the small irregularities of the surface of the lawn.

A building generally will possess an ideal setting from the standpoint of grades when it appears to be located on the summit of a slight knoll with the land sloping gracefully away from it on all sides. Ex-

cept in formal developments, a level lawn should not be constructed. In grading, endeavor to preserve the slight natural slopes and curves of the land, remembering that nature never produces perfectly level surfaces. This part of the grading should be carefully studied and considered before starting the work. The way in which it is done will determine whether a graceful, pleasing, natural lawn or a stiff, restrained, unsatisfactory one is obtained.

In doing the grading work, care should be exercised to save the top soil. Where cuts or fills are to be made, the top soil should first be removed and then replaced after the cuts or fills have been made. A top soil of 6 inches or more in depth is required for a lawn while a foot or more of top soil is desirable for the planting areas. If this work can be performed in the fall, settling will take place over the winter. In the spring the final work of grading may be accomplished.

LAWNS

A good lawn is an important feature of a well developed home grounds. It is often referred to as the canvas upon which the picture is created. It should possess openness and extent and should be



Fig.-5. A pleasing foreground composed of a spacious front lawn-area and a side enframing of trees help much in producing an appealing setting for the house.

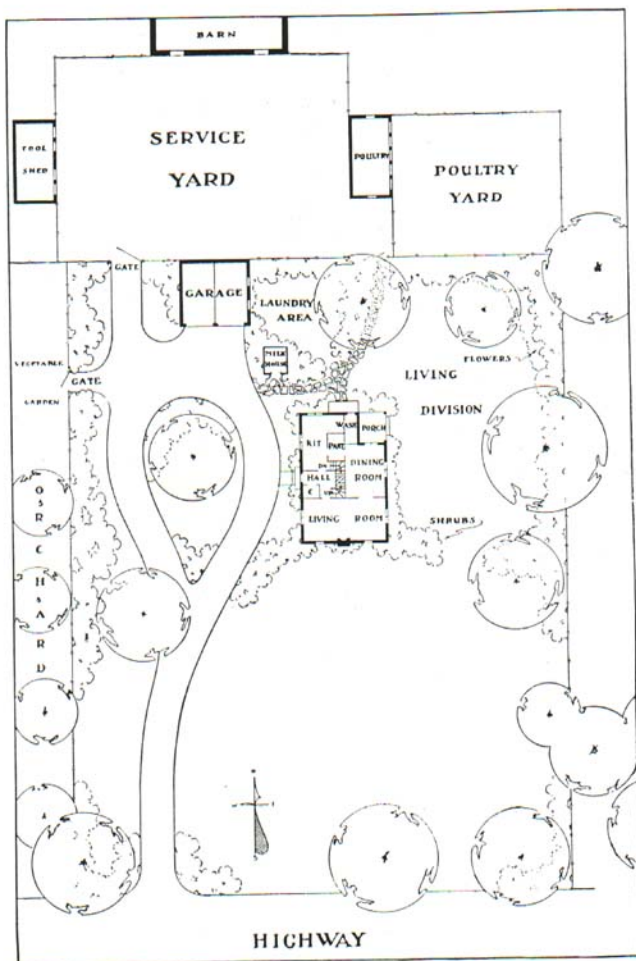


Fig. 6. A design exemplifying the ideals of a well planned farm grounds.

framed with plantings of trees and shrubs about its borders. Never should the lawn be cluttered with meaningless plantings of specimen shrubs and trees as is sometimes done. Being such an essential and permanent source of beauty, its construction and maintenance deserves the most careful consideration.

The soil for a lawn should be of good texture and should contain plenty of plant food and enough humus to retain moisture. A fertile loam or sandy loam with a clay subsoil which contains enough sand or gravel for under-drainage most nearly meets those conditions. When a lawn is to be constructed upon light sandy soil, a top-dressing of 2 inches or more of clay with a heavy application of well rotted manure should be mixed with the first 3 or 4 inches of sand. Frequently, in building a house, the soil excavated from the cellar is spread about, covering the good top soil with a subsoil which is infertile, of poor texture, and generally undesirable as a surface soil for lawns or plantings. A good lawn cannot be established upon subsoil. At least 6 inches of good top soil is necessary.

PREPARATION OF THE SEEDBED

Lawn making usually follows grading. If due consideration is given for the future lawn in all steps of the grading work, much of the trouble in preparing the lawn for seeding will be averted.

In establishing a lawn, the first consideration is that of preparing the seedbed. There is no specific formula to follow in this work because soil and local conditions vary so greatly that each project will need a somewhat different treatment; rather, it is the purpose to follow such a procedure as will prove most beneficial under the conditions at hand. But the usual practice will pursue in a general way the following course of operations.

The preparation of the soil should begin several weeks in advance of seeding. Then there will be the opportunity for improving the soil conditions, for the installation of tile drainage lines sufficiently in advance so that the tile will be actually functioning before seeding, and for the settling of the trenches and other areas where the soil has been more deeply disturbed before the final smoothing and seeding.

Early in the fall and early in the spring are the two most favorable seasons for seeding. For fall seeding it is desirable to begin the preparation of the seedbed in early summer. Such a long interval of growing season promotes the germination of many of the weed seeds in the surface soil, which may be killed by subsequent cultivations before

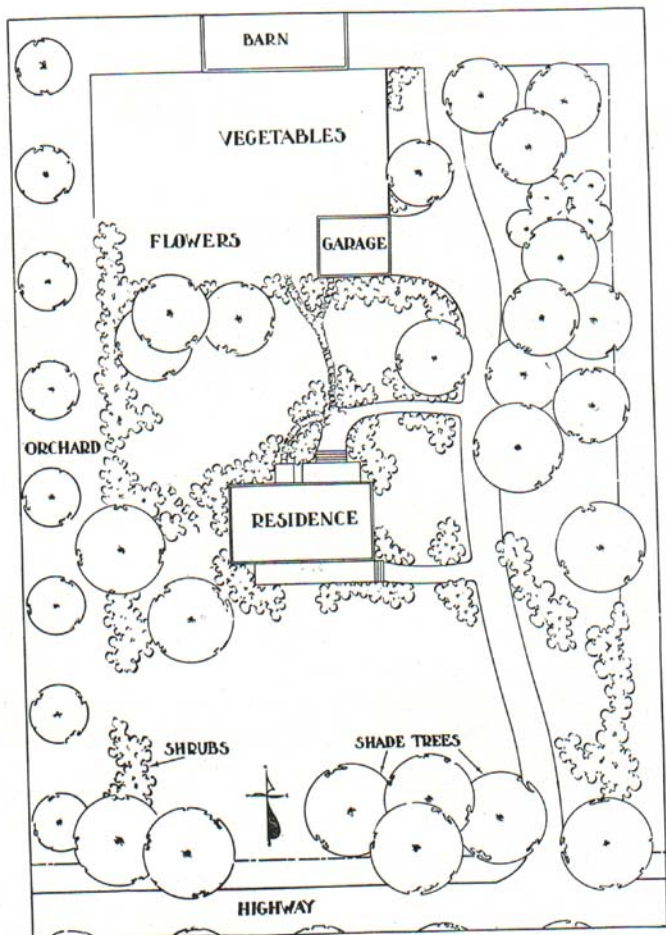


Fig. 7. A redesign of the Howard Nugent farm home grounds near Bad Axe, Mich. (See Figs. 8, 9 and 10.)

seeding. Summer fallowing otherwise will assist in preparing a better seedbed. For spring seeding, the preparation of the seedbed may well begin in early fall. Many of the annual weed seeds in the surface soil will then germinate before the fall is over and be killed by winter freezing. Settling will take place over winter and the alternate freezing and thawing of the fallow surface soil will make it more mellow and of better tilth.

The first operation usually involves plowing, spading or otherwise loosening the soil to the full depth of the top soil. This operation should not be so deep as to bring any subsoil to the surface. Usually from 6 to 12 inches in depth of top soil is desirable for establishing a good lawn. If top soil has to be purchased, the minimum depth is generally used, but a deeper top soil makes a lawn less subject to drying out and composes a deeper range from which the plant will draw much of its plant food. Plowing and other practices of working the soil should be accomplished when it is reasonably dry and particularly so if the soil is of the clay type. Good plowing includes plowing to an ample depth, and taking as large a slice as can be turned well over by the mold board of the plow. If the soil as it contacts the mold board is left smooth and shiny, the soil is too wet for plowing.

On large-scale work, the soil should be disked after plowing, before it has become dry. The disk works the soil to a considerable depth cutting the sod, breaking the clods, and loosening the soil. It is a timely practice then to remove the stones, roots, and other debris that has been brought to the surface by plowing and disking. The entire area should be systematically covered in this operation. Otherwise it is probable that this phase of the work will not be efficiently or economically accomplished.

The spring-tooth harrow will be found the most efficient implement to use after disking in working the surface soil to a finer and smoother state. But if the soil is still more or less in clods, the cultipacker, roller, or plank drag will be found useful. The cultipacker usually does the work best and crushes the clods to a greater depth. In addition, as the name implies, it firms the subsoil, which is helpful in the preparation of the seedbed.

After the soil has been worked and re-worked by such implements to a firm pulverized condition, the surface may be smoothed by rolling followed by the use of a grader, which will scrape the soil from the higher spots to the lower ones. On small scale operations, this will necessarily be accomplished by hand rolling and raking. It is usually

necessary to go over the area several times with these alternate operations to obtain as smooth a surface as is to be desired. But if the grading has taken care of most of the irregularities, the spike-toothed or smoothing harrow will prove an efficient implement to further pulverize and smooth the surface soil. Subsequent harrowing may also be accomplished with this tool to eradicate the weeds, to retain a fine soil mulch upon the surface, and otherwise to maintain a desirable weed condition until seeding. It is important that the successive weed crops be destroyed by frequent cultivation before seeding, so that the young grass will not need to compete with them.

FERTILIZING THE SEEDBED

A few years ago barnyard manure was the most generally used fertilizer for lawns. Now this material is not generally available except upon farms, so that one must use other materials for improving the physical and chemical conditions of the soil.

The physical condition of the soil measures its producing ability for grass as well as does its chemical content. If the soil is of a light sandy type, the addition of clay will do much to improve the physical condition. In a similar way, the addition of sand is helpful to a stiff, impervious clay soil. The physical texture of a soil is more commonly improved by the addition of organic matter or humus. The addition of humus to soils improves them by providing better drainage, better aeration, and a greater capacity for holding the needed capillary water. It tends to make a stiff clay soil friable and loamy, more pervious to air and water, as well as to promote a greater extension of plant roots. Humus will also improve the physical condition of light sandy soils for grass. It acts as a weak cement, binding the separate particles together, giving a better moisture-holding capacity, and firming the soil. Some authorities say that a good soil is composed of about 50 per cent solid matter, 25 percent air space, and 25 percent moisture. The solid matter should contain a liberal amount of humus to compose a good soil structure or arrangement of the soil particles which will tend to provide the necessary conditions of air, moisture, and temperature.

Humus may be added to the soil in the form of partly decayed organic matter which under favorable environmental conditions, such as air, temperature, and moisture, will decompose to form humus. Otherwise, the bacteria and molds causing decay will not be active. It is because of unfavorable air and moisture conditions that peat in its natural location is not transformed into humus. But when peat is spread

over the top soil of a lawn area and mixed into it, the conditions that favor decomposition are provided and the peat soon changes into humus.

Peat and sphagnum mosses are commonly abundant in shallow ponds or bogs in northern counties. The mosses are especially prevalent on the floating moors which surround certain ponds, and by their decay over a period of time play an important part in the gradual filling in of these ponds. The plants continue to thrive until the conditions become too dry. Peat mosses, therefore, form a large component of peat. This material has now become the most available and widely used form of organic matter for improving the structural composition of soils for lawns where barnyard manure is not procurable.

Muck is also used in a similar way for improving soil texture. It is often difficult to differentiate between peat and muck. The latter represents a more advanced stage of decomposition and is found on the top layer above peat deposits. Because of further decomposition, muck is darker and finer; in addition, it contains considerable clay and sand particles which have been blown or washed into the deposit. Muck does not compose a desirable material to use as a top soil for lawns on upland situations. There is almost as much diversity in the fertility and physical qualities of muck as of upland top-soil. But muck that contains 50 percent or more of organic material will prove a desirable source of organic matter in improving soils for grass. When used for that purpose it should be well mixed into the top soil to a depth of 4 inches or more in such a proportion that the muck will constitute not more than 25 percent of the soil mixture. Leaf mold, compost from straw or other vegetable matter, sewage sludge, and other organic material may likewise be used as a source of humus. It is largely a question of the most available and economical kind in the locality.

The chemical content of the soil usually must be improved to compose a more abundant food supply for the welfare of grass. Soil is a complex substance. The wide difference in the ability of soils to support plant growth is everywhere evident. Two adjacent farm fields containing soil that show little difference in appearance may show extreme differences in their crop producing power. A chemical analysis or a soils test may show that the one soil is rich in those chemical elements required by plants, and the other deficient in one or more of them. Soil usually contains a superabundance of silica, aluminum, iron, and some other elements, but is commonly deficient in nitrogen, often in phosphorus, and sometimes in potassium. Those are the three chem-

ical elements that are most commonly deficient in soils for grasses. Nitrogen is so important in promoting the growth of foliage in plants that an abundance of it is particularly necessary for grass. Since soils are often deficient in phosphorus and potassium, it is advisable in establishing a new lawn to include these elements with nitrogen to assure a satisfactory food supply. A commercial fertilizer containing those three elements is known as a "complete" fertilizer.

Since an abundance of nitrogen is so essential for grass, a complete fertilizer for lawns should contain a relatively higher percentage of nitrogen than of the other elements. It is now considered desirable that such a fertilizer should be in about the proportion of 10 percent nitrogen, 6 percent phosphorus, and 4 percent potassium. (That would be known as a "10-6-4 fertilizer".)

Phosphorus and potassium do not readily move downward in the soil or leach out. Surface applications of phosphorus and potassium, after the grass has been established, are not so satisfactory as if applied before seeding and worked into the surface soil. They will then be retained until the grass needs them. For those reasons, the fertilizer applied before seeding should contain a higher percentage of phosphorus. A 4-24-4 analysis is recommended for clay loam soils, while for sandy soils deficient in potash a 4-24-8 or a 4-24-12 analysis fertilizer would be better. The rate of application will necessarily depend upon the degree of deficiency and varies from 500 to 1,000 pounds per acre.

In applying fertilizers, uniformity of distribution is desirable. Over large areas it is best applied by a fertilizer spreader, but for smaller lawns special hand operated distributors may be obtained or it may be broadcast by hand. The fertilizer should then be thoroughly mixed with the soil to a depth of not more than 2 to 3 inches. At a much greater depth the fertilizer would be beyond the reach of most of the young grass roots. If possible, a week or so should intervene between the time of the fertilizer application and the seeding.

GRASS VARIETIES

One of the most important steps in lawn making is the selection of the proper varieties of grass to use. There are many kinds of grasses in America, but few that are best adapted to lawn building in Michigan. Different grasses have different soil, light, and climatic requirements, and in themselves are different in habit of growth, texture and color. Generally there are but a few kinds that will make a



Fig. 8. The Nugent farm home before planting. (See Fig. 9.)

satisfactory lawn under the conditions that prevail on any particular property. The sowing of other kinds is generally wasteful and otherwise objectionable.

The following kinds are most suitable for lawns in Michigan: Kentucky bluegrass, redtop, Chewings' fescue, and bent grass. Kentucky bluegrass is the most widely adapted grass for lawns in Michigan. Though it is not native to this section it has escaped cultivation, and where the soil is at least moderately fertile, moist, and sun exposed, the bluegrass generally thrives and persists to the exclusion of most other grasses. Lawn areas in southern Michigan even when seeded to other kinds usually become largely monopolized by bluegrass unless the soil is too dry, infertile or shaded.

Kentucky Bluegrass is also the most generally satisfactory variety for lawns upon home grounds because it possesses the ideal yellow-green color for a lawn, the desired degree of fineness in texture, is deeply rooted and spreads by underground roots to compose a fairly compact turf. It thrives with but moderate care, the seed is relatively low in price, and generally available in seed stores.

Bluegrass, however, is to a fault slow in germinating and in establishing a lawn. It will not thrive in the shade nor upon infertile, dry

or inefficiently drained situations. Neither does bluegrass produce a turf so compact as to smother dandelions and other competing weeds. These qualities of bluegrass present the need of other kinds of grasses where such demands or conditions are confronted.

Redtop is another kind of grass that has considerable value for the development of lawns in this part of the country. It possesses the attributes of good color and texture for general lawn purposes, of thriving under a wide range of soil conditions, of germinating quickly, and of producing a lawn effect in a relatively short time. It thrives upon soils that are too dry and infertile, too acid or too wet for bluegrass. For these reasons redtop has its place as a kind to mix with bluegrass or other kinds that become established slowly for the purpose of producing a quick effect. Otherwise, it is most suitable for lawns where the conditions of the soil are not adapted to bluegrass or bent grass.

Chewings' Fescue is another desirable kind of grass for lawns in Michigan. Its particular value lies in its low plant food, moisture and light requirement and in its tendency to form a thick, close turf of good color and fine texture. It is the best kind of lawn grass for establishing lawns under trees where the ground is both shaded and dry as well as for lawns on sandy soils. In the northern sections of the state, except upon clay-loam soils, it is the best general purpose lawn grass.



Fig. 9. The Nugent farm home after planting. (See Fig. 8.)

Bent Grass—There are many kinds of bent grasses that are also well suited to the production of ideal lawns. German bent, Rhode Island bent, velvet bent, maritime or sea-side bent, and creeping bent—the last more commonly established by the planting of stolons—are the most common kinds for lawns. Under favorable conditions the bent grasses produce the most dense and perfect turf and, with the least hand weeding, the most weedless lawns. They require a fertile, well-drained soil and plenty of sunlight. After such lawns are established they require much more attention in the way of fertilizing, top-dressing, watering, and mowing than lawns composed of bluegrass, fescue or most other grasses. When such care is given to this grass it produces the ideal lawn. But since upon most residential properties the soil conditions are not good enough for this grass and the care required for its welfare is more than the average lawn receives, bent grasses cannot be recommended for general lawn purposes.

SEEDING

In Michigan fall is the ideal seeding time. Late in August or early in September is the best time for fall seeding. There is usually a prolonged spell of cool, moist weather favoring the growth of new seedlings, between then and freezing weather so the grass will become



Fig. 10. Back yard view of the Nugent farm home grounds after planting.

sufficiently developed to withstand winter. Young grass develops best in the fall, tending to produce a strong root system and to stool out in its top development instead of producing an upright slender blade growth. Weeds are less troublesome than in the spring and most of them are killed by early frosts.

Seeding, however, is generally accomplished in the spring probably because many think that this is the ideal season and because psychologically they are in the mood to improve their property at this time. The earlier in the spring that seeding is done the better the grass will be established before the heat and drouth of summer overtake it, and before crab grass, a most pestiferous weed on new lawns, becomes established upon its sparsely covered areas.

The amount of seed to use depends largely upon the kind of grass, the quality of seed and the cultural conditions of the seedbed. A poor preparation of the seedbed means that a larger percentage of the seed is not going to find favorable conditions for germinating and growing. The average loss in this way on a well prepared seedbed should not exceed about 20 percent, but upon a poorly prepared seedbed it may extend to such a degree as to fail in getting a successful stand of grass. In a general way with good seed on a well prepared seedbed the rate of seeding should be from 80 to 150 pounds per acre or on smaller areas from 2 to 4 pounds per 1,000 square feet.

For unmixed sowings, the quantities used vary with the kind. For 1,000 square feet of surface, 1 to 1½ pounds of redtop is sufficient; 2½ to 3 pounds of bent grass, or of Kentucky bluegrass; 3 to 5 pounds of Chewings' fescue.

If the area to be sown is small and the conditions of soil and exposure somewhat variable, it is advisable to use a high grade prepared lawn mixture obtained from a reliable seedsman. About 3 to 4 pounds of such a mixture should be used to 1,000 square feet of lawn area.

The purchaser of grass seed must depend on the reliability of the dealer for quality of the seed since the general appearance tells little to the uninitiated. Grass seed mixtures may contain timothy, orchard grass, weed seed, and a relatively high percentage of chaff and other debris. They are also likely to be low in germination.

Even distribution of the seed is desirable. A mechanical seeder is preferable to hand seeding as the seed is distributed more uniformly. On most small areas where a seeder is not available, the seed must be spread by hand. In such instances the amount to sow should be divided



Fig. 11. Trees off-setting the side of the house help to develop a pleasing setting for it.

in half and one-half sown in strips over the area in one direction and the rest in strips at right angles to it. The seed cannot be evenly distributed in a heavy wind, but if there is but a slight breeze, an even distribution may be obtained by seeding only with the wind, even though the walk back be idle.

After the seed has been sown the seedbed should be rolled with a light roller. This is done to press the soil about the seed and to compact it to promote the rise of soil water by capillarity. Many persons recommend the raking of the soil after sowing to cover the seed, but it is the opinion of the writer that the average laborer doing this work will bury so much of the seed too deeply and spoil the evenness of distribution to such a degree that the work will result in more injury than good. On light soils where watering facilities are not available rolling may prevent much of the seed from blowing away.

WATERING

The germination of the seed and development of the seedlings will depend much upon the maintenance of uniform moist conditions after seeding. The lawn may be sprinkled directly after seeding if the soil is dry. Apply the water in the form of a fine mist rather than as pelting rain drops which would tend to pack the soil and leave a surface crust upon it after drying. Seedlings have difficulty in penetrating such a soil crust unless it is kept moist. This demands careful attention because the bright sun when accompanied by winds dry the surface rapidly. It has been said that the most critical periods in the life of a grass plant are during germination and directly after when the roots of the young plants have not as yet become established in the soil. Drying out at these periods is fatal to the young seedlings. Watering during the first few weeks must be repeated as often as is necessary to prevent the surface from becoming dry but need not be more at any one time than is sufficient to moisten the surface.

SODDING

Areas that are so steeply sloped that they may become eroded before the roots of grass seedlings can become established should be sodded. The borders of lawn areas, the edges of drives, walks, and



Fig. 12. A simple, dignified and harmonious development of the front lawn area.

of all planting areas should be sodded to prevent the soil from washing onto them and to compose neat effective edgings. Where an immediate lawn effect is needed, sodding is likewise most suitable. Upon small areas about homes where the subsequent care of a newly seeded lawn would be neglected or be too troublesome, sodding is also best. It is becoming a more common and satisfactory practice about newly constructed city and suburban houses to sod the limited lawn areas about them rather than to seed.

Good sod should be composed of densely rooted grass of the desired kind, and free from weeds and other grasses that may be objectionable. The sod should be cut into pieces of a convenient length and width and of a uniform thickness to insure an even surface when laid upon a well prepared base. Bluegrass sod should be $1\frac{1}{2}$ to 2 inches in thickness, but bent grass sod, being more shallow rooted, may be cut only an inch in thickness. If the sod is of a uniform thickness and the area to be sodded is prepared to a smooth, firm surface, the aim of attaining an even surface will be facilitated. In laying the sod, the pieces should be placed close together, but not crowded. Upon banks where there is danger of the sod slipping, the pieces should be set lengthwise across the bank and held in place by wooden pegs. These may be whittled to about $\frac{5}{8}$ " in thickness and to about 5" in length. Each sod should be pegged an inch or two below each upper corner and also at a point midway between them. They should be driven into the sod and bank to such a depth that the top of the peg will be but slightly below the cutting height of the mower. About a cubic yard of a sandy loam top soil, enriched with fertilizer that contains, in part at least, a quickly available form of nitrogen—in case of bluegrass or native sod, about a pound of good seed—should be spread over the sod to each 1,000 square feet of lawn area. This will settle into the crevices between the pieces, fill in the low spots and stimulate the growth of the grass until the roots become established in the soil below. The sodded area should be rolled and then watered by a lawn sprinkler. A day or two later when the sod has dried sufficiently to permit a re-rolling, it is well to roll the sod again as a means of developing a smooth surface, and of pressing the turf firmly into contact with the soil below.

LAWN MAINTENANCE

After the grass has grown to a height of 4 to 6 inches it should be given the first clipping, which should not be very close. A scythe is better for this cutting than a lawn mower as the young plants will not

be pulled out nor cut so close. The grass should be cut frequently enough thereafter to permit the clippings to remain on the lawn without being unsightly. These clippings, if allowed to remain will tend to maintain fertility and will form a dense mulch around the base of the plants which will tend to protect the soil from drying out during the summer months. Lawns should be cut frequently but not too close.

With bent grass lawns, however, it is desirable to commence mowing as soon as the new growth has attained an inch or so in height. The mower should be set slightly higher than may later be desirable. Bent grass should be cut every two or three days during favorable growing weather, and the mower should be set to cut much closer than with other grasses. As the compactness of a good bent grass turf prevents the clippings from sifting through the grass to the ground, the lawn looks untidy unless the clippings are removed. Hence a "catcher" should be attached to the mower to catch the clippings as they are thrown from the mower blades.

GROWING GRASS UNDER TREES

Much difficulty is often experienced in maintaining lawns under trees, owing in part to the limitation of sunlight. There are kinds of lawn grasses able to thrive under the condition of shade. Chewings' fescue and woodlawn meadow grass thrive with a limited quantity of light. Failure to grow grass under trees is more commonly due to the



Fig. 13. The bare and bleak appearance of many farm buildings as seen from the public highways might be much improved by the appropriate planting of hardy shrubs and trees.

additional limitations of plant food and moisture. This combination of limitations is too much for any lawn grass. While the grower cannot greatly modify the supply of light under trees he usually can do much to supply a bountiful amount of plant food and moisture. The roots of a shade tree so rapidly withdraw the soluble plant food materials and the moisture that the soil soon becomes more impoverished than in the unshaded lawn sections. Hence one may expect that the soil under trees should be more heavily and frequently enriched and watered if grass is to be maintained there. Thus when the infertility of the soil and lack of moisture are not limiting factors of growth under trees, grasses will thrive with but the single limitation of light.

WEED CONTROL

It has been said, "weeds do not make poor lawns! Poor lawns make weeds." An impoverished soil, lack of moisture, and neglect in other phases of maintenance are the most common causes of weeds in lawns. The eradication of weeds by digging, spraying or other means is not of permanent value under such conditions unless supplemented by watering, fertilizing, and by such other practices as to modify and improve the basic conditions of the soil for the welfare of grass. The growing and maintenance of a good, dense turf to cover completely every spot of the lawn area is the first and best general practice of preventing weeds. A good thick turf will crowd out many weeds that otherwise would become established upon a thin turf or upon bare areas. But good cultural conditions alone will not usually produce a weedless lawn unless supplemented by other practices.

Bent grass grows more densely than other kinds and crowds out and smothers weeds the best. Commonly, therefore, where this grass is being established weeding should not be practiced until the turf is established, because a large proportion of the weeds will be smothered as the turf thickens. The initial practice of weed control with bent grass is to furnish the growing requirements of the grass and let the grass take care of the weeds. After the grass has become established for about a year the "cleaning out" of any remaining weeds may then be accomplished. Thereafter little weeding is needed if bent grass is kept well fertilized, watered and otherwise maintained.

No single known method of lawn construction and maintenance gives complete weed control. Every condition in the practice of establishing and maintaining lawns has its influence upon the presence of weeds.

Spraying is the most feasible method of eradicating most kinds of lawn weeds. Most of the sprays that have been recommended in the past for this purpose have been superseded by a chemical known as 2, 4-D which has been found effective in stopping the growth of the foliage and roots of most of the broad-leaved weeds in lawns and causing their roots and tops to soon shrivel and die. Therefore, it is especially effective as a spray for killing such common lawn weeds as dandelions, chickweed, ground ivy and narrow-leaved plantain or buckhorn but does not usually kill crab grass or quack grass. Unlike most of the weedkillers used in the past it is not a quick killer but generally requires from 8 to 20 days. The best results are obtained when spray applications are followed by warm sunny weather. Temperatures above 60 degrees Fahrenheit are essential for full effect of the chemical.

This material will doubtless be on the market under various proprietary names. The purpose is to use it at a concentration of one part of 2, 4-D to 1,000 parts of water or 0.1 percent.

It should be applied as a coarse spray at the rate of $2\frac{1}{2}$ to 4 gallons to 1,000 square feet of lawn area. Spraying may be done with any type of sprayer but nozzles that give a coarse drenching spray are desirable. Thorough wetting of the weed foliage is the essential factor. It should not be used upon bent grass lawns, and young seedlings of other grasses are likewise subject to injury from this spray. One and one-third ounces of powdered 2, 4-D dissolved in 10 gallons of water will compose a spray of $\frac{1}{10}$ of 1 percent by weight, the strength desired. This chemical does not readily dissolve in water. Other substances are commonly used with it in proprietary mixtures to disperse it more readily in water. Hence such proprietary mixtures should be used at the dilutions recommended by the manufacturers.

Dandelion—The provision of good cultural conditions for the development and maintenance of a vigorous, dense turf is the first and best general practice for preventing dandelions in lawns. Other supplementary practices are otherwise useless.

Hand digging, although commonly practiced, is a laborious and less successful method of eradicating dandelions than the application of some material that will kill the roots as well as the foliage of the plants. Dandelions develop a deep tap root. Unless the entire root is removed or killed the plant will sprout again.

Upon lawn areas limited in size, dandelions may be killed by placing the amount of ammonium nitrate, sulphate of ammonia or nitrate



Fig. 14. Front view of home before remodeling and replanting. Note line of evergreens extending through the center of the lawn. (See Fig. 15.)

of soda that can be retained between the thumb and forefinger on the crown of each plant if this material is not washed off by subsequent rains for a day or so.

Upon larger lawn areas, except in the case of bent-grass lawns, dandelions may best be killed by the practice of spraying the lawn with 2, 4-D as previously directed.

Crab Grass (Finger Grass)—This weed that so commonly becomes an unsightly pest upon lawns in late summer and early fall is an annual grass, the seed of which germinates about the middle of June. About a month later it may be recognized by the appearance of its light green, wide, upright leaves and at this period may be most readily controlled by pulling. Later it assumes a very spreading, low-lying but compact form somewhat wider in leaf than bluegrass. Even during early August, it may be pulled since its root system is rather shallow. In late August and September, it spreads rapidly and sends forth its purple flowering spikelets that are very distinctive in form and color.

Crab grass is commonly most troublesome upon dry devitalized soils and upon recently seeded lawns. It is seldom very troublesome upon the better developed and maintained lawns. Where the removal of the plants during the earlier stage of their development has not

been accomplished, an effort should be made to prevent the flowering spikelets from maturing their seed. This may best be accomplished by raking the lawn with a steel rake before mowing endeavoring in this manner to raise the many lowlying runners that are terminated by the seed heads and then cutting them with the mower and removing them from the lawn. This will help much to prevent re-seeding. Every bare spot on the lawn invites the presence of crab grass and should be covered with fertile soil and planted with good lawn seed. It is a common but wasteful practice to apply good lawn seed on an infertile, dry soil.

Crab grass is not usually killed by spraying with 2, 4-D.

Plantain or Buckhorn—The narrow and wide-leaved plantain are common lawn weeds. The narrow-leaved plantain or buckhorn thrives upon dry, "worn-out" soils while the wide-leaved plantain generally is found where the soil is heavy and damp. Both may be eradicated by spraying with 2, 4-D as explained for the treatment of dandelions. Each produces a rather shallow compact root system which permits the plants to be more rapidly dug out than dandelions, particularly during the late summer when they seem more loosely rooted to the soil.

All of these practices are useless, however, unless supplemented by



Fig. 15. Home after remodeling and replanting. (See Fig. 14.)



Fig. 16. Before grading. Steep roadside banks are displeasing features in informal landscape developments. (See Fig. 17.)

such cultural practices of fertilizing and watering as will improve the soil and provide more favorable conditions for the welfare of grass.

Chickweed—The perennial chickweed commonly found in lawns, is a dense-growing, low-lying weed that thrives below the cutting edge of the mower and crowds out all competing growth except bent grass. But even upon bent grass lawns it is one of the most common and difficult weeds to eradicate.

It is impractical to control this and other such creeping perennial weeds by pulling. Frequently, the most feasible practice is to remove the entire sod area occupied by the plant and to replace with weedless turf. This is particularly feasible if undertaken before the weeds have become widely spread. Otherwise, the practice of spraying the lawn with 2, 4-D is the most feasible method of eradication upon bluegrass lawns.

Upon lawns of bent grass, 2, 4-D may be used where it may be confined to the infested areas but not as a spray over the entire lawn.

A general infestation of chickweed upon a bent grass lawn may be eradicated by spraying with calcium chlorate. This chemical compound is similar to sodium chlorate, an explosive compound which has been widely used to kill quackgrass and Canada thistles upon farm lands. Calcium chlorate has the advantage of being a safer, less hazard-

ous compound to handle and use. For the control of this and other creeping lawn weeds it should be used in the proportion of $1\frac{1}{2}$ to 2 ounces of calcium chlorate to a gallon of water. This amount should cover about 100 square feet of lawn area. The leaves should be thoroughly covered with the solution and the application made when the foliage is dry and when rain is not likely to follow closely and wash it off the leaves. This solution appears more effective when applied in late fall. There is more danger of injuring the grass if applied in hot, dry weather. Otherwise, it is effective when used at any season of the year.

USE OF TOP DRESSING

The use of undecomposed stable or barnyard manure as commonly applied to the lawn during the fall, winter, or spring months cannot be recommended. Experiments have demonstrated that areas seeded to Kentucky bluegrass and fertilized by an annual application of undecomposed stable manure have become more nearly monopolized by weeds each year. Large lumps of undecomposed stable manure upon the lawn tend to smother the grasses beneath them and later make a favorable medium for the germination and growth of the weed seeds contained in them.

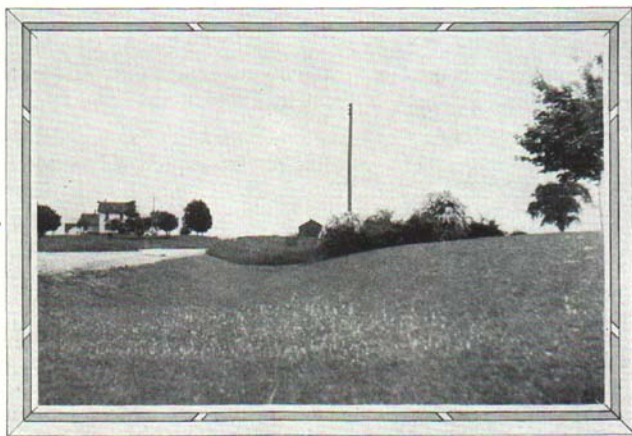


Fig. 17. After grading. Steep roadside banks should be cut back to form pleasing, flowing grades that will merge harmoniously into the surrounding landscape. (See Fig. 16.)

Well decomposed stable manure, however, is very valuable in maintaining lawns. For this purpose, it should ordinarily have remained in the pile for two or three years. For clay soils, particularly with bent grasses, this composted form of manure makes an ideal top dressing when mixed with 2 parts of clean, sharp sand and supplemented with 5 pounds of sulphate of ammonia to each cubic yard of the mixture. An excellent compost may also be made by decomposing straw, leaves, grass clippings, and such other organic wastes of the garden.

To accelerate the decomposition of these materials they should be stacked in layers not more than a foot thick, each layer thoroughly wet through and sprinkled with lime and sulphate of ammonia, using about 25 pounds of the former and 30 pounds of the latter to a thousand pounds of the dry organic material. A smattering of stable manure, sod, or top soil upon each layer will also tend to expedite decomposition. If such a stack is piled to a height of about 5 feet, forming a flat wide top to catch and hold rainfall, the mass should decompose in about three months of the growing season. Additional applications of water may be helpful during prolonged dry periods.

Before applying such compost to clay-loam soils, one part of clean, sharp sand should be mixed with it. Good top soil or decomposed sod may be used as a base with the decomposed organic material and sand for top dressing. The proportions of each to use should be determined largely by the physical qualities of the soil. Usually a mixture of one-half decomposed sod or of top-soil with one-fourth of sand and one-fourth decomposed manure or humus will constitute a good mixture.

Creeping bent lawns should be top-dressed each spring and early fall with about one cubic yard of the foregoing prepared mixtures to 1,000 square feet of lawn area. Frequently creeping bent lawns may be much benefited by light top dressings of this material at intervening periods. All grasses will be much benefited by a top dressing of that kind each spring. Watering the lawn directly after the application, especially if the mixture contains sulphate of ammonia or nitrate of soda, is desirable to prevent burning of the grass.

The secret of maintaining a good lawn is to begin with a good top soil, to provide efficient soil drainage, to water when necessary to prevent the lawn from drying out, and to keep the lawn well supplied with plant food. Rolling the lawn each spring, and with creeping bent lawns, rolling at least two or three other times during the growing season, is also very beneficial.

WATERING

The natural rainfall in Michigan during the summer is not usually sufficient to maintain lawns well. Artificial watering is necessary if lawns are to be kept growing steadily during this period of the season. Lack of moisture during these months is the most common limitation for the maintenance of good lawns. It is at such times, when the soil becomes too dry for grass, that dandelions and other deeper root-feeding and more drought-resistant plants become established. Grass requires about one inch of water each week to grow well. If the natural rainfall does not provide that amount, water should be applied by artificial means. Except with bent grass, which is very shallow-rooted, about two or three applications a week, moistening the soil each time to the full depth of the root system is better than lighter daily sprinklings. Automatic lawn sprinklers are the best means of applying water, since water should be applied to lawns only as rapidly as the soil can absorb it and since at any such rate from four to eight hours will be required to apply this amount.

WALKS AND DRIVES

Walks and drives are needed in the development of residential properties for accommodating traffic. They should lead conveniently to and from important points and places on the property, display the most pleasing vistas that can be made available, and occupy such positions as to prove least intruding upon the principal areas of the grounds.

Mild graceful curves are appropriate where the landscape development is informal and sufficiently spacious to make them fitting. But where the grades are flat or the area restricted in size, straight line walks and drives will usually be most appropriate. Where lawn areas have some spaciousness of effect, it is desirable to arrange the walks and drives to skirt their boundaries rather than to cut through the areas; walks or drives through a lawn area tend to spoil the unity and spaciousness of the effect. That is particularly true of entrance walks and drives of houses situated 50 feet or more from the front of the lot and where the width of the lawn is much greater than that of the front of the house. But for houses situated only a short distance from the street or on narrow lots, a straight entrance walk perpendicular to the face of the house is usually the more suitable.



Fig. 18. A shrubbery bordered drive makes a pleasing type of development.

Where the grounds are much wider than the house and the house is amply set back from the street, the entrance walk or drive should enter the property near one of the front corners of the lot to offset the front corners of the house and skirt the boundaries of the front lawn. Usually the walk or drive entrance will be selected on the "town side" of the property unless the topography is less favorable in that section. Starting in a line perpendicular to the street, the walk or drive, in its approach towards the nearest corner of the house, should be designed to compose a mild, sweeping curve that will avoid the front-lawn area. As the walk is continued in front of the house it should be in line generally parallel to the house. The mistake is commonly made of placing the entrance walk too close to the building. There should be ample spacing so as to leave sufficient room for foundation plantings and to give the feeling of safety to one who uses the walk from possible collision with the steps, porch, or building. The line of the entrance drive should be planned in a similar manner as it passes in front of the house in its course to the front entrance. Usually, however, it is desirable to carry the line of the drive toward the back of the property to reach the garage and service division of the grounds. In either case, the drive should pass within a reasonably convenient dis-

tance of the main entrance of the house as well as of the service entrance. From these points, it should be extended in such a manner as to provide for driving directly to the garage, to the farmyard, or to turn back to the highway. Usually, this suggests the development of a turn-around drive if there is sufficient space.

If a turn-around drive is designed on a farm it should also be so arranged as to accommodate service traffic from the highway to the farmyard along that side of the turn-around most distant from the house.

Usually as farm houses are designed and as farm drives are laid out, the main entrance to the house is in front while the entrance drive is along the side of the house. Under these conditions, the main entrance to the house is not conveniently accessible from the entrance drive and therefore, is seldom used. Likewise the front walk leading directly from the highway to the front door is inconvenient and seldom used. It would seem that the most reasonable location for the main entrance to the house would be upon the side adjacent to the entrance drive rather than upon the front facing the public highway. Likewise, the entrance walk should be laid out from the main entrance of the house to the nearest or most convenient point of access along the entrance drive. Where the main house entrance faces the highway and is

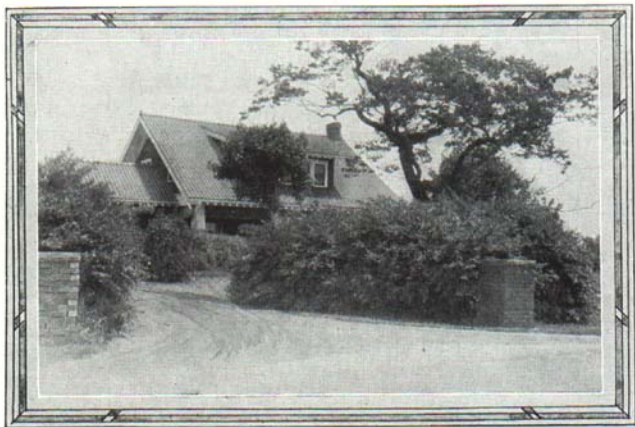


Fig. 19. A simple, dignified, and pleasing entrance drive.



Fig. 20. Entrance to the home grounds showing the "turn-around" drive.
(See design of drive, Fig. 6.)

supplemented by a front porch, the steps leading to it may be relocated from the front to the end adjacent to the entrance drive, thus making this point of access to the house more convenient.

Where good drainage exists, the surface of a drive or walk should be somewhat lower than the adjacent lawn. This makes the drive or walk less apparent as viewed from any point across the lawn and provides for the development of a pleasing graceful roll in the grade from the lawn elevation to the walk. Abrupt banks along the side of a drive or walk should be cut back for a considerable distance to form mild, pleasing grades that will unite harmoniously and appear naturally as a part of the larger lawn grade.

The construction of walks or drives should be such as to provide a most suitable surface at such seasons of the year as they are to be used. The principles of construction consist in first providing good sub-drainage, the lack of which is a most common cause of the breaking up of drives and walks. Tile drainage of the ground upon which they are constructed may be necessary or the use of a base of gravel or cinders from 6 inches to a foot in depth may be required below the materials used in the surface construction. This is particularly essen-

tial upon clay soils. The second principle is to construct the walk or drive to be impervious to water and to provide good surface drainage. Muddy drives and walks lack these requisites. The third principle is based upon the fact that well constructed walks or drives are usually composed largely of hard impervious stone packed tightly together with only enough of other material to fill the spaces between the stone and to bind them.

The stones forming the basic structure or aggregate furnish the supporting strength to a walk or drive and provide a surface to withstand the wear of traffic. Except with macadam or crushed stone drives, sharp, clean, coarse sand is the most available material in Michigan which meets the requirements of a good filler for the spaces between the stone. The binder used to hold the stone and sand in place and to make the surface less pervious to water varies with the several kinds of walks or drives which are to be constructed. With gravel drives and walks, the binder is the clay contained in the sand or gravel, a small percentage of which is necessary for this purpose. When the drives are constructed of concrete, the cement used is the binder; while asphalt is the binder of an asphaltum drive. In all of these cases, how-

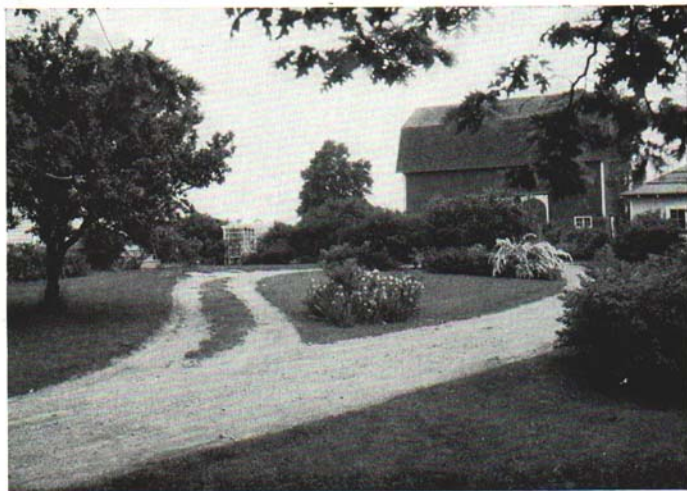


Fig. 21. The farm home of John Schwark, Elsie, Mich., showing the "turn-around" drive and shrub masses to screen the barn from the highway.

ever, the percentage of stone used, its imperviousness to water, and its degree of hardness determine to a large degree the strength and permanence of the construction.

Bank-run gravel usually contains too much sand and clay in proportion to the stone to be most suitable for drives. Screened gravel or, better still, washed gravel is more suitable. Where hard stone is easily available in a locality, it constitutes an ideal basis for road construction but unfortunately such stone is not usually available in southern Michigan.

Cinders from factories and power plants make good drainage material for placing under drives, particularly upon clay soils. Where gravel or crushed stone is not within the means of the home owner for the construction of drives, cinders alone are often a great improvement over a dirt drive. However, cinders are readily crushed and quickly ground down to a dust with much traffic and do not have the supporting strength of stone for heavy loads.

PLANTING

A leading function of the grounds about the house is to compose a pleasing setting for the building. In the development of such a setting, the effect of a luxuriant vegetation in the form of sheltering trees, bordering shrubs, and verdant lawns is a common quality of attractive places. It would be difficult to visualize a pleasing residential property without the presence of abounding lawns fittingly supplemented by the verdure of shade and ornamental trees, hardy shrubs, and flowers. It is such a landscape environment that appears most inviting as one in which to live and therefore adds its share of appeal to whatever pleasing qualities the house itself may present.

Many things are to be considered in the selection and arrangement of plants to gain the most satisfactory effect of the whole. But with the great number of things that plants may be used for, in a landscape way, the main theme of such a development—that is, the effect of the whole—should always be kept in mind as a leading aim of attainment. In planting home grounds, one should realize that the aim is to create a picture which has as its elements a house and other buildings, roads, walks, lawns, and other more or less separated elements. To unite these several disconnected parts into the production of one harmonious picture is the leading function of the plantings. To arrange the plantings about the house so that the building may seem a natural out-

growth of the spot and to arrange the plantings on the grounds so that each planting may seem dependent upon the presence of every other planting or other element in the design is the purpose of the planting. When it can be realized that these plantings are made not primarily for the sake of their own individual beauty but more because of their relationship to the effect as a whole, to the picture about to be created, the first principle to guide one in planting has been mastered.

The planting of each grounds is a different problem, in certain respects, from every other. No definite rules, therefore, can be given to guide one in the work, and no plan may be drawn to serve all places, but a few general principles underlie all problems. Before any planting design is made, the grounds should be studied in reference to the general arrangement that is most serviceable. The style of architecture of the house, the position and character of any large trees already on the grounds, the slope and general character of the land, and any other natural condition should be studied to see what kinds of beauty, what general character of pleasing appearance those conditions most readily suggest. Each home grounds is more or less suggestive of a certain type of beauty which may be brought forth and emphasized with the least difficulty.

After perceiving this type of beauty, one may proceed so that the necessary details of arrangement will emphasize and enhance the character thus selected. One will find certain elements which detract from the beauty of the grounds, which are defects in the picture; those should be screened by the use of plantings. Views within the grounds, such as of a garage, laundry yard, boundary fence, service drive, or other unsightly spot; views beyond the grounds, as of a neighbor's barns, garages, or other views hardly pleasing and acceptable to the sight—all these should be entirely hidden from view by the use of plantings or at least partly screened to minimize their unsightliness.

Other elements in the design should be just as carefully preserved and enhanced by plantings. The most pleasing lines and portions of the house, for example, may be emphasized and carefully preserved to view. A wide sweep of open lawn, with a border and background of trees and shrubbery, is always a pleasing and acceptable sight. Vistas without the grounds, as of a distant woods, a winding river or a neighboring farm house, and even the traffic upon a public road, are often welcome sights which add to the pleasure and value of the grounds. It is especially important that these vistas be carefully preserved from the

living rooms of the house, not always from the parlor but from those rooms where the family spend the major portion of their time. The plantings then serve a very important function by concealing defects and enhancing the parts that are most pleasing. With this thought in mind one can readily imagine how beautiful and attractive some of the ordinary looking places of today may become by the proper use of plantings.

Plantings, when improperly used, may detract from both the value and appearance of the place. The effect of a well-designed house is frequently ruined by the improper location or arrangement of plantings. Trees planted too thickly or too closely in front of the house, a lack of harmony in the design of the grounds with that of the house, or plantings placed to hide the house from its most pleasing point of view are a few of the many causes which often spoil the effect of a well designed house. Let it be remembered that plantings are to enhance rather than to detract from the expression already developed in the design of the house by providing a pleasing setting.

There are three general rules for guidance in arranging the plantings:

First, avoid straight lines. The general effect of all lines in informal planting should be graceful and natural rather than stiff, formal, or artificial. Plantings should seem to be a natural outgrowth of the spot rather than a crude piece of man's handiwork.

Second, arrange the plants in groups and masses, selecting few kinds and many of each rather than many kinds and few of each.

Avoid planting meaningless, isolated specimens over the lawn. Naturalistic masses and groups of plants are necessary to give structural character to the design and each group or mass should consist of many specimens of but a few kinds, rather than one or two specimens of several kinds. The particular shrubs selected should be used in repeated groups and masses, not precisely in the same combinations but sufficiently so that the effect of one planting may be harmonious with the other. In this manner, unity of effect may be obtained.

Third, plantings should be massed about the base of the buildings, grouped about the junctions or curves in the walks, massed about the boundaries and corners of the property but not usually along the front boundary of the property.

When arranged in this way, an open lawn bounded with naturalistic plantings of shrubbery and trees will be the general effect.

The plantings may perform other desirable functions. They may be arranged to shelter the house from the winter storms and the summer heat or to frame and accentuate the attractiveness of desirable vistas. Masses of shrubs may be used to replace an undesirable fence or hedge. They may be planted to prevent people from wearing paths across the lawns and to unify the walks, buildings, and other elements of the grounds into one harmonious design.

The planting should be done early enough in the spring so that the shrubs will be well established before the heat and drouth of summer overtakes them. In preparation for planting, the beds should be dug and prepared to a depth of a foot or more. The distance for setting the shrubs depends largely upon the size that they attain. Japanese barberries should be planted 2 to 3 feet apart, spireas 3 to 5 feet, and lilacs about 6 to 8 feet. In three or four years, when set at those distances, the branches should be so intermingled that their individuality in the beds is lost and a unified mass effect produced. In transplanting, the roots should be kept moist and sheltered from the sun and wind. The plants should be set slightly deeper than they stood in the nursery and packed firmly with the best top soil immediately about the out-spread roots. If the soil is dry, water after planting. It will help to settle the soil about the roots and keep them moist. The tops may then be pruned back to balance the loss of roots and to improve the shape, leaving a few large buds on each of the strongest shoots.



Fig. 22. Branch of entrance drive leading to the farm barns.



Fig. 23. A pleasing informal back-lawn showing boundary planting to screen neighboring buildings without sacrificing the desirable view of the woods beyond.

SHRUBS

The choice of varieties is perplexing because there are so many handsome shrubs, all of which seem most desirable to the home garden maker. A few of the standard kinds that are handled by every nurseryman and safest for the beginner to use, are listed.

First of all there is a Vanhoutte spirea, formerly a popular spring-flowering shrub. Its remarkable freedom of bloom and beautiful foliage produced on branches drooping gracefully to the ground made it exceedingly popular. This spirea, which is only one of a large group of related plants, is very hardy and grows well in any moderately rich and well drained soil. It attains a height of about 6 feet and is particularly suited to mass plantings in borders and background plantings, or around the boundaries of the lawn. Another very widely used kind is bridalwreath spirea, a double-flowering form with leaves that resemble those of the plum. The garland spirea, although not so well known is a desirable early spring-flowering shrub with small delicate foliage and white flowers. It is particularly suitable for planting in the foreground of other higher and coarser growing shrubs. For summer-flowering, the genus is represented by the Froebel spirea that blooms in late June. Its flowers are produced in corymbs or flat flower heads of a rosy crimson color, sometimes approaching a magenta. Where a low shrub is wanted for summer effect this is one of the best.

It would be hard to name a shrub so cosmopolitan in its characteristics, combining as many desirable qualities, as the Japanese barberry. It is one of the few shrubs that is attractive at all seasons of the year. In the spring and summer its graceful branches are clothed with small yellowish green leaves that change to a bright scarlet in the fall. Later they are shed to expose the scarlet berries that enliven the landscape all winter. Though a sandy loam soil seems ideal for the barberry, it thrives equally well on practically all types of soil that are well drained and it seems equally cosmopolitan as to exposure. The graceful form it assumes and its low habit of growth makes it suitable for filling in small spaces, such as between walks and buildings or for planting in front of spirea and other higher growing shrubs. There is nothing better to use where a low ornamental hedge is desired than this barberry that thrives with little care after it is once established. This species is not a host for wheat rust and may be planted in any part of the state.

The lilac is the most common and still most indispensable of the large shrubs. For screens and backgrounds of shrubbery masses, used in uniform colors rather than mixed, lilacs produce a most attractive effect in late spring. There are so many desirable improved varieties of this old time flower that, even if one were given a few bushes of the old-fashioned type by some well meaning neighbor, one could not afford to plant them because the new improved kinds are so superior. They produce larger and better flowers over a longer season. There-

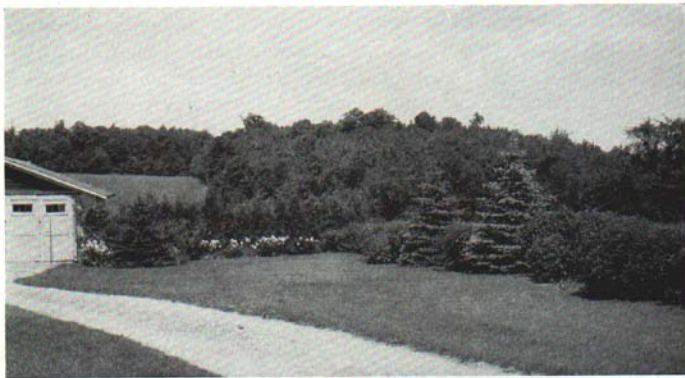


Fig. 24. The remaining section of the back-lawn area shown in Fig. 23.

fore, it is well to go to a nurseryman and get an improved variety that will be superior to the old-fashioned type. There one may become acquainted with the Marie Legraye, a beautiful white; Mme. Lemoine a good double white; Dr. Regel, a handsome rosy pink; Chas. X, an attractive rosy lilac; Toussant L'Ouverture, a very dark carmine colored one in bud, turning to a violet-red when in full bloom, and an endless list of other improved sorts of the old-fashioned lilac. The other species of lilac include at least one other type that should be used; for general landscape effects it is to be preferred to any of the foregoing group because it is more graceful in its growth, with smaller leaves and large, open, gracefully drooping panicles of reddish purple flowers. This is the lilac listed as *Syringa chinensis*. The persian lilac is very similar to it but more dwarf in its growth and with lighter colored flowers.

The *Philadelphus coronarius* or mockorange is another, large high-growing shrub that is prized especially for its fragrant white flowers so abundantly produced in June. It is too high-growing and coarse-textured for planting immediately about the house. Fortunately the Lemoine mockorange is lower growing and finer textured, making it an excellent shrub for nearby plantings of about 5 feet in height. *Philadelphus virginial* is a newer variety with double waxy-white flowers, rather coarse in texture and not quite so high growing as the common mockorange. The yellow-leaved varieties are not so vigorous, high-growing, or free-flowering. There are many other varieties and species of this shrub, and as a rule they are hardy, thrifty, generally free from insects and fungous troubles, and long-lived.

The bush honeysuckles are very acceptable in border plantings about the home grounds. Though many produce beautiful spring-flowering effects in white or pink, they are prized more for the red coral-like berries that overcolor them in midsummer after most of the shrubs are through blooming. The Morrow honeysuckle is one of the best varieties for this purpose, while the rosy tartarian is one of the most effective in flower.

A class of popular shrubs often confused with the honeysuckles, possibly because of their trumpet-shaped flowers, is the Weigela or Diervilla. Although the latter is now considered the standard botanical name, in many catalogues it is listed as Weigela. Of the many varieties in pink, white, or red that are offered, the old-fashioned pink flowering, *Weigela rosea*, continues to lead in popularity. At the Graham Experimental Farm, Grand Rapids, the pink-flowering variety, Gustave Mallet, has proved of outstanding beauty in bloom and

one of the hardiest. Another variety, *Weigela Eva Rathke*, is also used considerably by those familiar with its qualities. This variety has carmine-red flowers and somewhat darker foliage. It blooms over a longer period than the others and almost as profusely in the shade as in full sunlight. It is very acceptable, therefore, for planting along the north side of buildings or in other partly shaded situations.

Of the many other shrubs worthy of consideration, there are the golden bells, or *Forsythias*, whose yellow blossoms are produced in the spring even before the leaves, so early in fact that the flowers are often caught by late freezes; and the rugosa rose, with its luxuriant foliage and ever-blooming habit. There is no trouble about having enough kinds to select from but the difficulty is in limiting the list to those that are best. For the home garden maker, it will be wise to rely chiefly on the standard sorts.³

Upon farm home grounds, when one is unable to purchase as many shrubs as may be necessary to complete the planting, native shrubs may sometimes be found in the wild to supplement the cultivated kinds. The elderberry, gray dogwood, red dogwood, flowering dogwood, sumac and others, often found along the fence rows, meadows and woods, make admirable shrubs for screens and boundary plantings. Young specimens should be selected under these conditions, carefully dug during the dormant season, conserving as many roots as possible, and heavily pruned back after planting to reduce the demand upon the roots and promote the development of a dense form.

ATTENTION SHOULD BE DIRECTED TO THE FACT THAT IT IS ILLEGAL TO DIG SHRUBS, TREES, OR OTHER PLANTS ALONG PUBLIC HIGHWAYS OR TO PURCHASE THEM FROM THE WILD UNLESS THEY HAVE BEEN INSPECTED BY THE STATE NURSERY INSPECTOR.

³See Extension Bulletin 152, "Hardy Shrubs for Landscape Planting in Michigan" for more detailed information concerning shrubs.



Fig. 25. Informal masses of hardy shrubs and trees compose the pleasing enclosure of this living division of the grounds of Kenneth Ousterhout in Antrim County, Mich.

SHRUBS FOR SPECIAL PURPOSES

SHRUBS FOR HEDGES

- | | |
|--|---|
| <i>Acanthopanax pentaphyllum</i>
Five-leaved aralia | <i>Lonicera morrowi</i>
Morrow honeysuckle |
| <i>Berberis thunbergii</i>
Japanese barberry | <i>Rosa hugonis</i>
Hugonis rose |
| <i>Deutzia lemoinei</i>
Lemoine deutzia | <i>Rosa rugosa</i>
Rugosa rose |
| <i>Hydrangea peegee</i>
Peegee hydrangea | <i>Rosa rugosa hybrida</i>
var. Grootendorst |
| <i>Ligustrum amurense</i>
Amur privet | <i>Spiraea vanhouttei</i>
Vanhoutte spirea |
| <i>Thuja occidentalis</i>
American arborvitae | |

SHRUBS FOR BORDER PLANTING

a. LOW GROWING

<i>Spiraea froebeli</i> Froebel spirea	<i>Rosa floribunda</i> (in variety) Florabunda rose
<i>Berberis thunbergi</i> Japanese barberry	<i>Rosa polyanthus</i> (in variety) Polyantha rose
<i>Deutzia gracilis</i> Slender deutzia	<i>Choenomeles lagenaria pygmaea</i> Dwarf flowering quince

b. MEDIUM GROWING

<i>Cotoneaster divaricata</i> Spreading cotoneaster	<i>Rhodotypos kerrioides</i> Jethead
<i>Deutzia lemoinei</i> Lemoine deutzia	<i>Rosa rugosa</i> Rugosa rose
<i>Philadelphus lemoinei</i> Lemoine mockorange	<i>Spiraea prunifolia</i> Bridalwreath spirea
<i>Euonymus alatus compactus</i> Dwarf winged euonymus	<i>Kerria japonica</i> Japanese kerria



Fig. 26. A pleasing back yard at the home of Norman Bowman, Richmond, Mich., composed of informal boundary plantings which screen unsightly neighboring vistas and give privacy to this living division of the grounds.

c. TALL GROWING

<i>Diervilla florida</i> Rose weigela	<i>Philadelphus coronarius</i> Mockorange
<i>Euonymus europaeus</i> European euonymus	<i>Syringa</i> (in variety) Lilac
<i>Forsythia intermedia spectabilis</i> Showy forsythia	<i>Viburnum</i> (in variety) Viburnum
<i>Lonicera</i> (in variety) Honeysuckle	<i>Kolkwitzia amabilis</i> Beauty bush

SHRUBS FOR SPECIMEN USE

<i>Caragana arborescens</i> Siberian pea-tree	<i>Syringa amurensis japonica</i> Japanese tree lilac
<i>Cercis canadensis</i> Red-bud	<i>Prunus cerasifera</i> var. <i>pissardi</i> Purpleleaf plum
<i>Euonymus alatus</i> Winged euonymus	<i>Prunus triloba</i> Flowering plum
<i>Exochorda grandiflora</i> Common pearlbrush	<i>Rhus cotinus</i> Common smoketree
<i>Tamarix</i> (in variety) Tamarix	

SHRUBS FOR EXPOSED LAKE FRONT

<i>Caragana arborescens</i> Siberian pea-tree	<i>Philadelphus coronarius</i> Mockorange
<i>Colutea arborescens</i> Common bladder-senna	<i>Rosa rugosa</i> Rugosa rose
<i>Elaeagnus augustifolia</i> Russian olive	<i>Rosa setigera</i> Michigan prairie rose
<i>Rhamnus cathartica</i> Common buckthorn	<i>Tamarix</i> (in variety) Tamarix
<i>Rhus</i> (in variety) Sumac	<i>Viburnum opulus</i> High-bush cranberry

SHRUBS FOR SHADY SITUATIONS

<i>Cornus</i> (in variety) Dogwood	<i>Symphoricarpos racemosus laevigatus</i> Garden snowberry
<i>Hydrangea arborescens grandiflora</i> Snowhill hydrangea	<i>Symphoricarpos vulgaris</i> Coralberry
<i>Kerria</i> (in variety) Kerria	<i>Weigela eva rathke</i>
<i>Ligustrum vulgare</i> European privet	<i>Viburnum</i> (in variety) Viburnum
	<i>Rhodotyphus kerrioides</i> Jetbead

SHRUBS FOR SANDY SOILS

<i>Berberis thunbergi</i> Japanese barberry	<i>Rosa setigera</i> Michigan prairie rose
<i>Elaeagnus augustifolia</i> Russian olive	<i>Rhus canadensis</i> Fragrant sumac
<i>Caragana arborescens</i> Siberian pea-tree	<i>Rhus glabra</i> Smooth sumac



Fig. 27. A stately old lilac used as a shade tree upon the lawn.

Lonicera tatarica
Tartarian honeysuckle

Rosa rugosa
Rugosa rose

Rhus cotinus
Purple fringetree

Tamarix (in variety)
Tamarix

SHRUBS FOR STEEP BANKS

Rosa setigera
Michigan prairie rose

Rhus (in variety)
Sumac

Sorbaria sorbifolia
Ash-leaved spirea

Symphoricarpos vulgaris
Coralberry

ROSES

HYBRID PERPETUALS

FOR CUT FLOWERS

(Half Hardy, Requiring Some Protection Over Winter)

Frau Karl Druschki (White)
George Arends (Pink)
General Jacqueminot (Red)
J. B. Clark (Red)
Mrs. John Laing (Pink)

POLYANTHA ROSES:
Cecile Brunner (Pink)
Golden Salmon (Orange red)
Gruss An Aachen (Pink)
Joyous (Pink)
Lafayette (Crimson)
Snowbank (White)

HYBRID TEAS

For Cut Flowers

(Requiring Protection Over
Winter)

Countess Vandal (Coppery
bronze pink)
Eclipse (Yellow)
Etoile de Hollande (Crimson)
Kaiserin Auguste Viktoria (White)
McGredy's Scarlet
Mrs. E. P. Thom (Yellow)
Radiance (Pink)
Red Radiance (Red)
Yellow Gloria

ROSES FOR LANDSCAPE EFFECT

Rosa rubiginosa (Sweet-briar)
Rosa rubrifolia (Red-leaved rose)
Rosa rugosa (Japan rose)
Rosa rugosa (hybrid, var.
Grootendorst)
Rosa setigera (Michigan prairie
rose)
Rosa hugonis
Father Hugo rose

FLORIBUNDA ROSES

(Require Protection Over Winter)

A. Grille (Red)

P. Cheer (Red)

World's Fair (Red)

TREES

"Among all the materials at our disposal for the embellishment of country residences, none are at once so highly ornamental, so indispensable or so easily managed as trees or wood."

Trees are especially valuable as screens, enframements, backgrounds, for shade, shelter, and for their own inherent beauty. These should constitute some of the objects to consider in the selection and placement of them about our residence. An informal arrangement of trees about the home grounds may transform places which might otherwise seem bare and bald into interesting and often picturesque scenes. Trees should be disposed around our houses in informal groups so as to compose a pleasing effect of the scene as a whole as well as to



Fig. 28. Furnishing the living division of the home grounds to accommodate its use. Note the young plantings near the background that will later screen the barn.

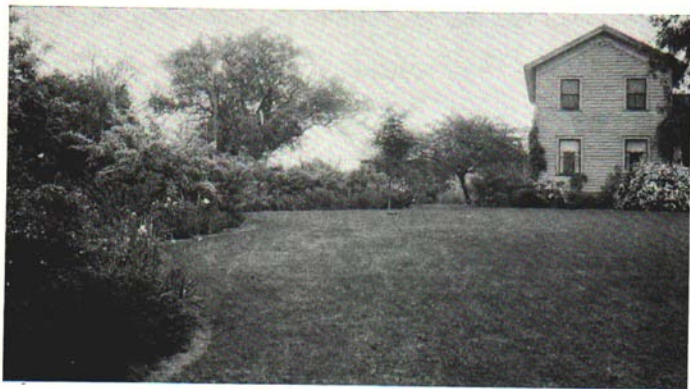


Fig. 29. An informal mass planting of hardy shrubs with perennials in front of them compose a pleasing enframement of the lawn.

provide all the comforts and conveniences desired about a dwelling.

In selecting trees for home planting, form, hardiness, adaptability, rapidity of growth, shade production, freedom from insects and diseases, neatness, and general beauty should be considered.

In purchasing trees, one should obtain healthy, well shaped trees. It is generally a waste of time and money to set poor, deformed trees. Wild trees may be used but they are more likely to succumb to the shock of transplanting than those that have been previously transplanted and grown in the nursery. As a rule, small trees may be transplanted more successfully than larger ones. Trees for street planting should be two inches or more in diameter and 10 to 12 feet in height to offer the physical resistance commonly required.

In transplanting trees, as many roots as possible should be preserved because trees with large root systems grow much better than those whose roots have been severely pruned.

As the tree is purchased from the nursery, the top or crown is usually already formed. This general shape of the top should be preserved in pruning after transplanting. If the root system has been severely pruned, it will be necessary, however, to cut back the branches of the top to maintain a balance between the roots and foliage, although it is better to maintain this balance by saving the roots than by sacrificing branches.

During transplanting, the roots of the trees should never be allowed to become dry. If a choice is allowed, transplant a tree on a cloudy day, as a bright sun or a dry wind exhausts the stored up moisture. As soon as the trees arrive from the nursery they should be "heeled-in" in moist soil until planting.

The hole in which the tree is to be set should be larger than is necessary to accommodate the roots without bending or twisting them. If the site, as is often the case, is on "made" ground, remove at least a cubic yard of the soil or rubbish and provide as much good loam. In planting the tree, spread a layer of fine mellow soil mixed well with about one-third its bulk of well decomposed stable manure, if available, in the bottom of the hole. Never use fresh manure. The tree should then be planted by packing the fine soil firmly about the roots, setting the tree about two inches deeper in the soil than it stood in the nursery. If the soil is dry at planting time, watering directly after planting will be beneficial as it will help much in packing the soil about the roots and supplying moisture.



Fig. 30. The farm home of Bruce Wheeler, Snover, Mich., shows the desirability of well arranged masses of hardy shrubs about the home to supplement the presence of trees.

DECIDUOUS TREES

Oaks—Of all the trees that may be used on the home grounds, the oaks are undoubtedly the best shade trees for, with few exceptions, they are beautiful, long-lived, and little subject to damage by insects and disease. Though oaks are generally considered slow-growing, some make very rapid growth when given good care. The white oak is probably the best known and one of the longest lived trees. It is slow in growth and is in such small demand that nurseries do not generally grow it. The red oak thrives upon lighter soil than maples or elms, develops a straight sturdy trunk and a symmetrical top, and its foliage turns a brilliant color in the fall. It is the most rapid growing of the oaks and good for both lawn and street planting. The scarlet oak is much like the red oak, although it is smaller and does well even on poorer soil. Its foliage becomes brilliantly colored in the fall, hence the name. The pin oak grows taller and more slender than most other oaks and usually has a straight trunk. The leaves are small and quite persistent through the winter. This tree thrives upon moist ground but grows equally well where the soil is relatively dry. It is especially suitable for street planting and also makes a very desirable lawn tree, the foliage being less brilliantly colored than the red oak although beautiful during all parts of the growing season.



Fig. 31. The farm home of John Schwark, Elsie, Mich., showing a pleasing arrangement of shrub masses.

Elms—The American elm is probably the stateliest tree grown in this country. Usually the tree assumes a high, upright, spreading form, and produces shade which is not too dense for either lawn or street purposes. As a street tree, it combines more desirable qualities than any other kind although it grows too large for narrow streets. It thrives best upon a reasonably fertile soil with plenty of moisture and under these conditions, is a comparatively rapid grower.

The Chinese elm is a very rapid growing tree that is more finely branched and leaved than the American and that is adapted to a drier



Fig. 32. The Norway maple is one of the best shade trees for lawn and street planting.

and lighter type of soil. Its rapid rate of growth results in the production of wood that is brittle and much subject to breaking in wind and storm. The tree is smaller, probably much shorter lived and otherwise not comparable in desirability to the native American elm.

Maples—No trees have been more widely used for planting the home grounds than the maples. They are a very satisfactory kind of shade tree for planting about the home grounds or for street planting. The white, soft, or silver maple is one of the species commonly used. Its susceptibility to borers and to the splitting and breaking of its branches in wind and storm make it less desirable than the hard or sugar maple and the Norway maple. The sugar maple thrives upon fertile soil conditions and is notable for the beauty of its form and the colorations of its foliage in the fall.

Where the soil is not fertile and moist, the Norway maple will thrive better. It also withstands the dust and smoke of towns and cities better than most other trees. The red-leaved variety of the Norway maple is a very attractive dark scarlet-leaved strain that is especially attractive when properly placed in a landscape setting.

The ash-leaved maple or box-elder is one of the least desirable kinds for a shade or ornamental tree. It is a rapid-growing kind but seldom produces a well formed specimen. It is subject to the splitting and breaking of its branches in storms, and its seeds, spread by the winds, become a general pest in nearby gardens and shrubbery plantings.

There are many other kinds of deciduous trees that are not so large growing as the foregoing ones but are more ornamental and in better scale with the moderate sized home grounds. For example, there are the redbud, saucer magnolia, flowering dogwood, Paul's scarlet hawthorn, mountain ash, white birch, cut-leaved alder, maidenhair tree, flowering crab, and flowering cherry that are very appropriate and attractive in season about the home without monopolizing a considerable area.⁴

EVERGREENS

There are few home grounds where a few evergreens cannot be advantageously used for enlivening the winter effects about the home grounds. They are desirable if planted sparingly in informal arrangements about the lawn where otherwise the repetition of effects as produced by deciduous plants tends to be monotonous. They are much used for foundation plantings particularly in front of the house where

⁴For more complete consideration of shade and ornamental trees, request Extension Bulletin 160.

if the dwarf kinds are selected and the conditions of soil and exposure favorable, they may prove most suitable. However, they do not thrive in the cities and some kinds commonly are winter injured when growing in a situation that is exposed to the southern sun and western winds. They are likewise excellent for garden hedges and screens since they appear equally well at all seasons of the year, and their dark foliage colors compose excellent backgrounds in the development of landscape effects with other plants.

Most evergreens are adapted to light, sandy, well drained soils, and do not thrive well upon stiff clay soils. The arbor-vitae, however, is a plant found in the wild, growing upon low, swampy situations. Likewise the hemlock thrives where there is ample soil moisture and a well moisture-laden atmosphere.

Spruce—More spruces have been planted about home grounds than any other kind of evergreen. They are fast-growing, very hardy, and do well on most kinds of soil. For quick effects under average conditions, the spruce are generally the best. They are much used for wind-breaks and hedges as well as for planting in groups about the lawn.

The Norway spruce is one of the best and commonest planted of all the spruces. It adapts itself well to any soil and almost any condition. The tree is clean, trim, and bright both in summer and winter.

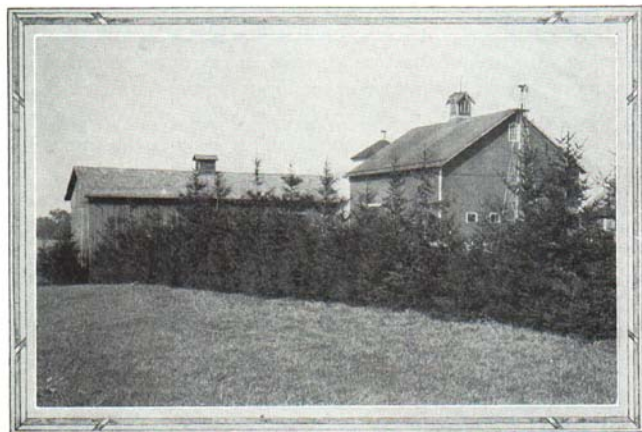


Fig. 33. The Norway spruce is a good kind of evergreen to use as a wind-break for the farm yard.



Fig. 34. When spruce and other hardy evergreens are arranged in informal groups about the lawn as a windbreak they are more pleasing in effect than when planted in a line.

For farm windbreaks, it is one of the very best. To maintain a thick growth at the base of the trees, it is often necessary to top the trees. Care must then be taken to prevent the formation and growth of two leaders. The beauty of all evergreens depends largely upon the preservation of a good healthy growth about the base of the tree, whether they are used as hedges, windbreaks, or lawn specimens.

The white spruce is one of the finest of all the spruces for landscape planting in Michigan. It is vigorous, large-growing, hardy, and densely leaved. Its branches hold their foliage well to the base of the plant and the tree is long lived.

The Colorado blue spruce is one of the most beautiful of the evergreens. The branches are produced in whorls around the trunk and the foliage is dense and bluish. It thrives in almost any soil and locality, is a vigorous grower, and does well in cold, exposed situations. The trees are propagated in the nurseries by grafting scions from the finest, bluest trees on vigorous seedlings, thus producing trees that are uniformly of a comparatively intense blue color. When seed of

this variety is planted, some of the seedlings come moderately blue while others revert to the green.

Pine—The white pine is one of the desirable species of pines, both for planting about the home and for producing windbreaks or shelter belts. When planted for windbreaks, white pine should be placed farther apart than other evergreens as the limbs grow out close to the ground and spread widely. The foliage is softer and finer than most other evergreens. The young trees look neat all the year around, while the old specimens are picturesque.

The red or Norway pine is one of the best pines for general landscape planting in Michigan. It is rapid in its growth and during its earlier years develops a dense luxuriant, bright yellow-green foliage that is very attractive. In maturity the tree becomes more open and picturesque and the foliage is darker in color.

The Austrian pine is likewise a good pine for landscape planting. In most of its qualities it is similar to the Norway pine. However, the foliage is somewhat coarser, more rigid, and darker in color.

Hemlock—The hemlock is a beautiful evergreen but is not recommended for general planting. The foliage is very fine, producing a delicate effect and the trees are graceful and usually long-lived. They stand shearing well when planted in hedges and will grow in the shade. For planting in groups with other evergreens, they are excellent. The trees do best with a northern or eastern exposure and when protected from the drying winds of the south and west. They prefer a moist soil and a moist atmosphere. Sometimes the trees have a tendency to grow rather straggly and should be topped if necessary to maintain a dense growth of the lower branches.

Arbor-vitae—These evergreens, also known as the white cedars, are usually small-growing, formal-shaped trees. They are different in texture and color from other evergreens and are very beautiful when well grown. The pyramidal varieties are most largely used and may be especially valuable in grouping with other evergreens for foundation plantings or for screens or hedges. They stand shearing very well and can be trained to almost any shape. They do best in a moist deep soil but will thrive on any moderately fertile, well drained soil. Arbor-vitae may be found growing wild upon many of Michigan's low, moist lands. They do not withstand the dry, dusty and smoky atmosphere and dry soil conditions that generally prevail in the cities.⁵

⁵For more complete information about evergreens, request Extension Bulletin 178.

TREES FOR SPECIAL PURPOSES

STREET PLANTING

<i>Acer saccharum</i> Sugar maple	<i>Ulmus americana</i> American elm
<i>Acer platanoides</i> Norway maple	<i>Quercus palustris</i> Pin oak
<i>Quercus rubra</i> Red oak	<i>Platanus orientalis</i> European plane-tree

TREES FOR SPECIMEN PLANTING

<i>Acer platanoides schwedleri</i> Schwedler maple	<i>Pyrus</i> (in variety) Flowering crab
<i>Magnolia soulangeana</i> Saucer magnolia	<i>Cercis canadensis</i> American redbud
<i>Crataegus oxyacantha</i> var. <i>pauli</i> Paul English hawthorn	<i>Betula</i> (in variety) Birch
<i>Cornus florida</i> Flowering dogwood	<i>Prunus cerasifera pissardi</i> Purpleleaf plum
<i>Quercus palustris</i> Pin oak	<i>Morus alba pendula</i> Weeping mulberry
<i>Sorbus americana</i> Mountain ash	<i>Thuja</i> (in variety) White cedar
<i>Fagus</i> (in variety) Beech	<i>Picea</i> (in variety) Spruce

TREES FOR EXPOSED LAKE FRONT

<i>Betula pendula</i> European weeping birch	<i>Pinus montana mughus</i> Mugho pine
<i>Betula populifolia</i> Gray birch	<i>Pinus resinosa</i> Red pine
<i>Caragana arborescens</i> Siberian pea-tree	<i>Pinus slyvestris</i> Scotch pine
<i>Crataegus oxyacantha pauli</i> Paul English hawthorn	<i>Pyrus baccata</i> Flowering crab

<i>Elaeagnus angustifolia</i> Russian olive	<i>Quercus macrocarpa</i> Mossycup oak
<i>Picea excelsa</i> Norway spruce	<i>Quercus palustris</i> Pin oak
<i>Picea canadensis</i> White spruce	<i>Robinia pseudacacia</i> Common locust
	<i>Sorbus americana</i> Mountain ash

TREES FOR WINDBREAKS

<i>Pinus strobus</i> White pine	<i>Thuja occidentalis</i> Arborvitae or white cedar
<i>Picea excelsa</i> Norway spruce	<i>Pinus resinosa</i> Red or Norway pine
	<i>Pinus sylvestris</i> Scotch pine

VINES

Vines are sometimes as essential in harmonizing the house with its surroundings as trees and shrubs. When used in this manner, their principal function is to tone down the stiff, bold angles and bare surfaces of the house, producing a unity of the house in the landscape that could be obtained in no other way. They are also valuable in covering steep banks, walls, and fences, and in the production of screens.

Success in their use depends upon selecting the proper places to plant the vines and upon choosing the most appropriate vine for each place. As one frequently sees them used, they are covering spaces which would be far more beautiful if left open or leaving spaces exposed which should be covered, thus ruining the architectural features of the building. If correctly used, they should embellish rather than conceal the architecture. Porch columns, cornice lines, corners and angles of buildings should be left open here and there to reveal the form and design of the structure. By planting the less sightly portions and leaving the more beautiful elements of the house exposed, even the most ordinary looking houses may often become very attractive. The style of architecture of the building will largely determine the character of the vine that should be selected to embellish it. The Dutch-

man's pipe and Boston ivy are more suitable for the development of the formal effect than the freer growing vines such as the clematis and honeysuckle. Some of the flowering vines that do not produce a dense shade are particularly valuable for draping porch columns and training about windows or along the cornice of a porch. The flowering clematis, wisteria, and honeysuckle may often be used in this way, while on porches with a western exposure where a dense shade is desirable, the Virginia creeper, bittersweet and others that produce a heavier foliage may be most desirable.

The planting of vines too closely to the foundation of a building is a frequent cause of failure in their development, because the soil is so dry in such a location that vines cannot thrive there. It is better to set the roots a foot to eighteen inches from the wall where the soil is moist and the roots may thrive better. Exposure is also an important consideration in planting vines. Many of the vines, such as wisteria, climbing roses, and clematis do best with a southeastern exposure, while the Virginia creeper, Dutchman's pipe, and the honeysuckles thrive in shady places with a northern exposure. Vines such as the Boston ivy that are clinging to a brick, stone, or cement surface are most subject to winter killing upon a southern exposed wall. Most vines, however, flower more freely if given plenty of sunlight. The soil is also a very important factor in growing vines successfully. They require a well drained soil, fairly moist, and fertile, although they sometimes survive and struggle along under adverse soil conditions. Poor soil, should be replaced with rich loam if this can be obtained. Otherwise, the soil should be enriched with well decomposed stable manure, peat moss, or commercial fertilizer; one should be careful that this material is not allowed to come in direct contact with the roots. After planting, the soil should be kept well cultivated and never allowed to become hard and dry.

The dust and gases of the cities ruin many of the vines, although certain kinds such as Veitch Japanese creeper (Boston ivy) and Virginia creeper seem to thrive even under these conditions. These vines, however, should not be allowed to climb upon wooden structures as they are likely to make the house damp and to cause the wood to decay. Vines are very acceptable in planting steep banks and thus preventing washing, while by covering bare and unsightly places under trees or over dead stumps, they may be made to produce excellent landscape effects. For covering stone walls, fences, arbors, and in countless other ways, vines will be found most effective.

VINES FOR SPECIAL PURPOSES

FLOWERING VINES

<i>Clematis jackmani</i> Jackman clematis	<i>Campsis radicans</i> Trumpet creeper
<i>Clematis paniculata</i> Sweet autumn clematis	<i>Wisteria sinensis</i> Chinese wisteria
<i>Lonicera japonica halliana</i> Hall Japanese honeysuckle	<i>Polygonum auberti</i> Silver lace vine

VINES FOR COVERING BRICK, STONE, MASONRY

<i>Parthenocissus tricuspidata veitchi</i> Veitch Japanese creeper	<i>Euonymus radicans vegetus</i> Bigleaf wintercreeper
<i>Parthenocissus quinquefolia engelmanni</i> Engelmann creeper	

VIGOROUS CLIMBING VINES WITH HEAVY FOLIAGE

<i>Celastrus scandens</i> American bittersweet	<i>Lonicera</i> (in variety) Honeysuckle
<i>Campsis radicans</i> Trumpet creeper	<i>Wisteria sinensis</i> Chinese wisteria
<i>Parthenocissus quinquefolia</i> Virginia creeper	<i>Aristolchia macrophylla</i> Dutchman's pipe
<i>Clematis paniculata</i> Sweet autumn clematis	

HARDY CLIMBING ROSES

Blaze (Scarlet)	King Midas (Yellow)
Climbing American Beauty (Carmine)	Mary Wallace (Light pink)
Doubloons (Yellow)	Mme. Gergorie Staechelin (Pearl pink)
Dr. Huey (Dark crimson)	New Dawn (Shell pink)
Dr. J. H. Nicolas (Pink)	Summer Snow (White)
Gardenia (Cream white)	



Fig. 35. *Coreopsis lanceolata* is a dependable free-flowering perennial.

HARDY PERENNIALS

Hardy perennials will always remain a most popular class of flowering plants. There is not a time during the whole flower season in which some hardy perennial is not in bloom, while during July and August, when almost all the woody shrubs have ceased blooming, these plants are mainly depended upon for flower display. There is such a wide selection of hardy perennials that kinds may be found that are adapted to almost any condition of soil or exposure that exists. For planting under trees or shrubberies, on sloping dry banks, or along the borders of ponds or brooks suitable perennials may be selected which thrive under such conditions. Their ability to exist with little care makes them a very suitable and desirable class of plants for the home grounds.

Perennials are especially suited for border planting and are most effective when placed in front of shrubbery masses. They are also used to advantage when planted along garden walks, walls, fences,

against buildings, and in innumerable other places about the home grounds. They should be arranged in groups or naturalistically massed, as the effect produced by a colony is more attractive than the effect of a mixture of kinds scattered aimlessly with few plants of each together.

Many of the perennials can be grown from seed. It is best to sow the seed in hotbeds or cold frames very early in the spring, and the seedlings may be afterwards transplanted out-of-doors. Many however, are propagated more easily by division.

Of the old-time favorites, there are the foxgloves, larkspur, hollyhocks, sweet-williams, and phlox which typified the plantings of the early colonial gardens and which are just as desirable today. There are the columbines, blanket-flowers, coreopsis, peonies, and poppies, favorites for their brilliant flowering effects. For planting about ponds or upon deep moist soil, the purple loosestrife, iris, forget-me-not, lily-of-the-valley, beebalm, trillium, cardinal flower, and the ornamental grasses are especially suitable, while for late summer and fall effects the hardy chrysanthemums, goldenglow, asters, and anemone

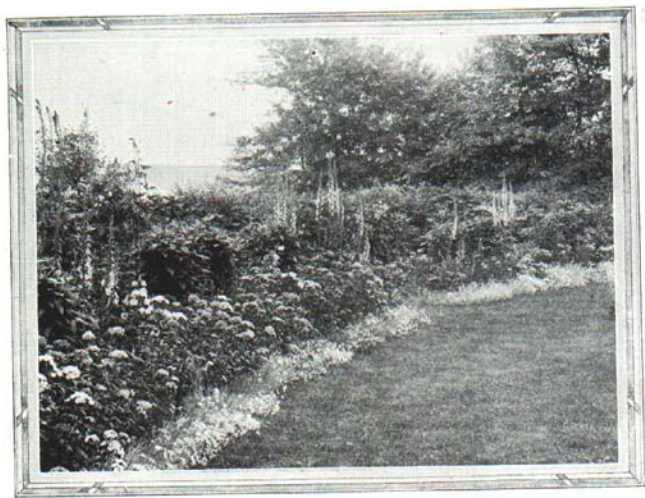


Fig. 36. Hardy perennials arranged in repeated groups and masses are most effective in the foreground of shrubbery.

or windflowers are best. So, from early spring until late fall when the ground is finally covered with a blanket of snow, the hardy perennials shed their robes of pleasing colors over the garden landscape.⁶

PERENNIALS FOR SPECIAL PURPOSES

STANDARD TYPES FOR GENERAL PLANTING

<i>Iris germanica</i>	<i>Rudbeckia laciniata</i>
German iris	Goldenglow
<i>Phlox paniculata</i>	<i>Coreopsis lanceolata</i>
Garden phlox	Lance coreopsis
<i>Paeonia</i>	<i>Dianthus barbatus</i>
Peony	Sweet-william
<i>Delphinium</i>	<i>Aquilegia</i>
Larkspur	Columbine
<i>Aster</i>	<i>Chrysanthemum</i>
Aster	Chrysanthemum
	<i>Althea rosea</i>
	Hollyhock

PERENNIALS WHICH SHOULD BE MORE LARGELY USED

<i>Achillea ptarmica</i> var. <i>boule de neige</i>	<i>Hibiscus moscheutos</i>
Ball of snow	Common rosemallow
<i>Monarda didyma</i>	<i>Gaillardia aristata grandiflora</i>
Oswega beebalm	Common perennial gaillardia
<i>Hosta plantaginea</i>	<i>Anemone japonica</i>
White plantainlily	Japanese anemone
<i>Gypsophila paniculata</i>	<i>Iberis sempervirens</i>
Babysbreath	Evergreen candytuft
<i>Papaver orientale</i>	<i>Aquilegia formosa</i>
Oriental poppy	Sitka columbine
<i>Phlox subulata</i>	<i>Veronica spicata</i>
Moss phlox	Spike speedwell
<i>Chrysanthemum coccineum</i>	
Painted lady	

⁶See Extension Bulletin 146, "Hardy Perennials for Landscape Planting in Michigan," for more detailed information.

ANNUALS

Annuals are always desirable on every home grounds as they are most essential in producing the best and most continuous display of flower during the summer months. Their great variety and adaptation to all soils and conditions as well as the many beautiful ways in which they may be used about the home grounds make them almost indispensable. As cut flowers, they are the particular favorites of nearly everyone, and the planting of the home grounds without a few such annuals as sweet peas, zinnias, asters, pansies, and nasturtiums would hardly seem complete.

Annuals are also especially valuable in producing quick effects as well as for beautifying the grounds of the renter or person who has not the means to procure the more expensive perennial or permanent kinds. When planted in the foreground of shrubs or among perennials, annuals are most pleasing, but it is not desirable to grow annuals in flower beds dotted over the lawn. In the free and informal style of



Fig. 37. Hollyhocks should be planted against buildings, walls, or in front of high plantings.

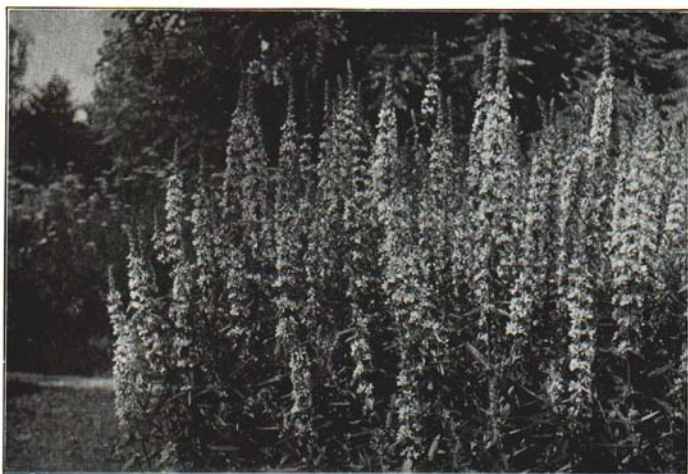


Fig. 38. Purple-loosestrife is a midsummer flowering perennial that thrives best in moist soil.

landscape gardening, they should be planted in informal areas about the borders of the home grounds, and, when so arranged, they enhance the beauty of the entire place. They may also be appropriately arranged as border plantings, along garden walks, about the base of buildings, or in front of walls or fences.

Annuals, fortunately, are very easy to grow. Almost any of them may be grown successfully by sowing the seeds, directly in the permanent beds, but usually better plants are obtained by seeding them in hotbeds or cold frames or in boxes of earth in the house, from which they may later be transplanted to the beds. Frequently the seeds may be sown a month earlier when started in this manner and a longer flowering season is obtained.

The kinds of annuals are so numerous that a selection is largely a matter of personal preference. The pansies, if sown in July or August, produce an excellent early spring display, while, if seeded indoors in late winter and planted in a partially shaded location, they should bloom continuously during the summer. The sweet alyssum, dusty-miller, candytuft, and lobelia make excellent edging plants; while for summer flower displays, nasturtiums, petunias, coxcomb, stocks, ver-



Fig. 39. Cobia is an annual vine attaining a great growth in a single season.

bona, annual phlox, poppies, salvia, zinnias, and balsams are all easily grown and very effective. Portulaca is most accommodating in covering dry sandy banks and the heliotrope, marguerites, stocks, and mignonette in furnishing the gardens with their delightful fragrance. For large foliage effects there is nothing to compare with ricinus or castor oil bean, while the large beautiful colored flower spikes of the snapdragon compare very favorably with the beauty of any of the perennials. In late summer, the asters, cosmos, and burning-bush add their brilliance to the flower display, and nearly all of these annuals continue to bloom till frosts dismantle their robes of beauty.



ANNUALS FOR SPECIAL PURPOSES

ANNUALS VALUABLE FOR CUT FLOWERS

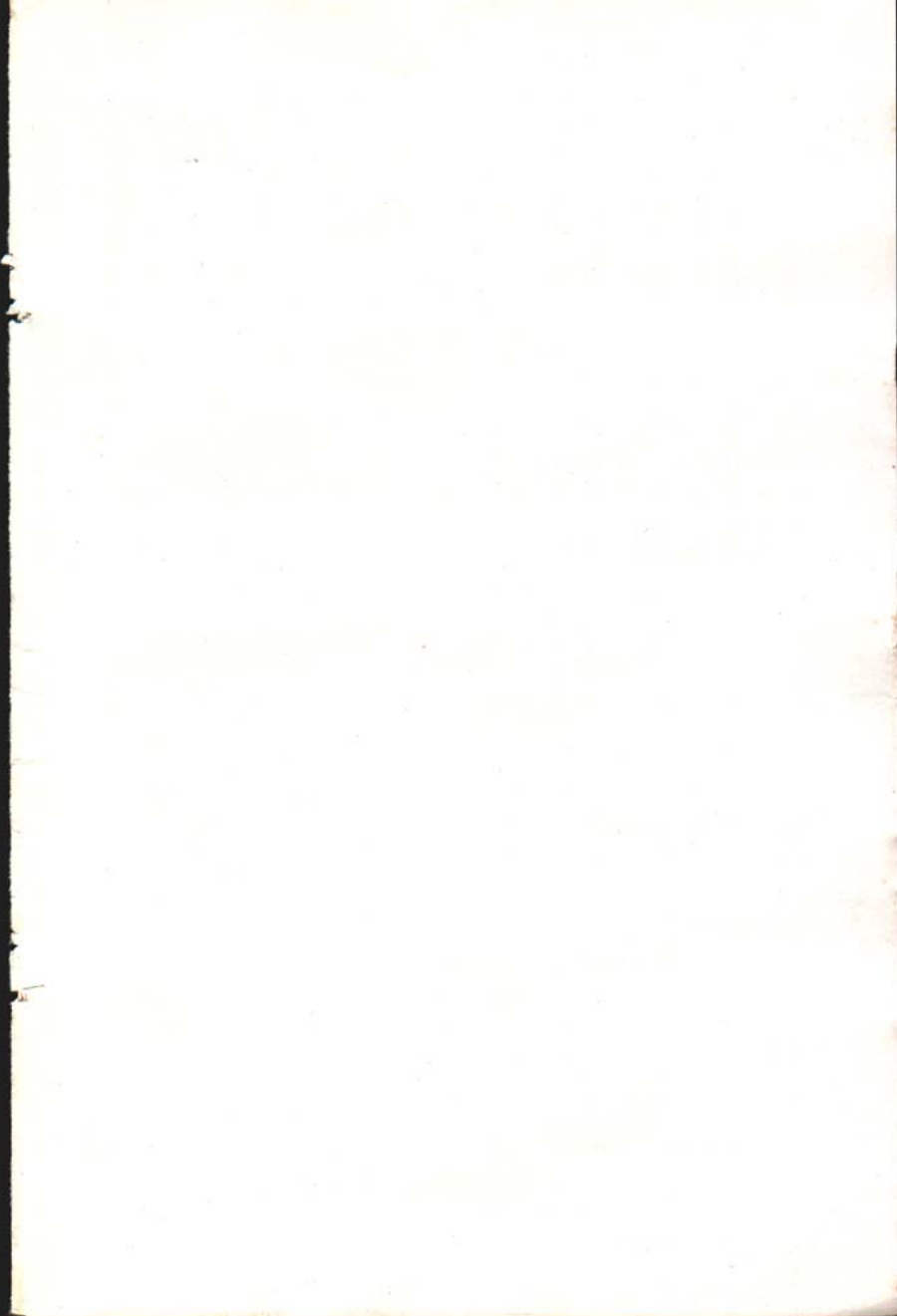
Asters, late branching	Bachelor buttons
Sweet peas	Zinnias
Cosmos, early flowering	Snapdragon
Pansies	Corn flower
Nasturtiums, dwarf	Heliotrope
Mignonette	Stocks
Calendula	Dianthus
	Annual Larkspur

ANNUALS FOR GARDEN EFFECTS

FOR	FOR	TALL
EDGINGS:	BEDDING EFFECTS:	GROWING ANNUALS
Sweet alyssum	Annual phlox	Castor oil bean
Lobelia	Verbena	Sunflower
English daisy	Annual poppies	Cosmos, late
Dwarf cockscomb	Petunia	
Dusty miller	African daisy	
Ageratum	Marigold	
Candytuft	Balsam	
	Celosia	
	Portulaca	

ANNUAL VINES

Cyperus vine	Wild cucumber
Balloon vine	Morning glory
Gourd, ornamental	Hop vine
Climbing nasturtiums	Moon vine
Scarlet-runner bean	Cobea



Cooperative extension work in agriculture and home economics. Michigan State College and U. S. Department of Agriculture cooperating. C. V. Ballard, Director, Cooperative Extension Service, Michigan State College, East Lansing. Printed and distributed under acts of Congress, May 8 and June 30, 1914.

11-49 : 20M