Grounds Maintenance Manual

LONGFELLOW and
FREDERICK LAW OLMS TED
HISTORIC SITES

NATIONAL PARK SERVICE

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GROUNDS MAINTENANCE MANUAL

LONGFELLOW AND FREDERICK LAW OLMSTED HISTORIC SITES

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SECTION A - MAINTAINING THE HISTORIC SITE

1. Appearance of the Historic Site

Until relatively recent times historic site maintenance was focused on structures rather than on landscape and structures. Today maintaining an historic landscape is considered just as important as maintaining the structures. In fact, in most instances, the two are seen as one whole as they should be.

In times past people put great emphasis on selecting sites on which to build structures. Obtaining just the right size with the proper mix of fields and woodland, high places and lowlands, was an important part of the settler's objectives. And maintaining the site afterwards was critical to everyday life.

Attempting to show this as part of the total restoration philosophy is important. The site must show the way its inhabitants lived, and it must serve, to the extent possible, as an educational exhibit. At the Longfellow House, the importance of the garden to the life of the poet and his family, especially his daughter, is an important aspect of the message to be conveyed. At "Fairsteds" showing that the grounds were a virtual arboretum and display garden further carries out the landscape architect's notions concerning plants and their use in the landscape.

Restored landscapes are difficult to care for because they are ever changing. They are subject to the ravages of time -- growth, storms, droughts -- and, unlike structures, they are not relatively set once restored. Landscapes are also subject to treatment that would have been unknown to them during their time. Such problems as visitor foot traffic causing soil compaction, litter, maintaining walks and drives wide enough to handle visitor circulation and keeping these smooth and free of weeds,
and maintaining rest facilities, picnic areas, litter receptacles, and places for people to sit and rest are all modern problems imposed upon the authentic and restored landscape.

Goals in maintaining a restored landscape are to keep the landscape vigorous and healthy using modern day knowledge and, at the same time, accommodating visitors without compromising authenticity. In a finite sense, this is virtually impossible to do in that the environment changes over time. Even the very composition of the air has changed since the mid to late 19th century. But in a general sense it is possible to convey the feeling of the desired period, in part, through careful care and maintenance.

2. Basic Areas of Concern in Landscape Maintenance

A. Soils

**Maintenance objectives:** Soil in which the landscape grows is extremely complex. Basically, it serves to anchor plants in place and to provide a vehicle through which water may be absorbed, oxygen may aerate the roots of the plants, and nutrients may be carried by soil water to the absorbing plant roots. If these objectives are not met, optimum plant growth declines causing a general deterioration of the landscape.

To meet these objectives, organic matter, or sometimes mineral matter such as sand, is added to the soil and spaded in. In so doing, compaction is eliminated and proper spaces for aeration are provided. Water taken in by plant roots keeps plant cells turgid and also carries chemical elements (nutrients) into the plant.

**Lawns:** At both historic sites in question (Olmsted and Longfellow) good lawns are already in place. Care of these will take the form of
fertilizing to add nutrients, liming to adjust the soil pH, watering, patch seeding, thatching, aerating, mowing, and weed control. On an historic site there is always a problem concerning how often a lawn should be mowed. In the 19th century people were not as concerned about mowing lawns on a weekly basis even after lawn mowers came into common use in the third quarter of the century. In these landscapes today we have the problem of visitor traffic over the lawns, leading to soil compaction. If we allow lawns to grow too high before mowing them, too much thatch will build up, leading to aeration and moisture problems as well as disease related issues. It becomes important to compromise, then, and to set a level concerning length of lawn. A height of two and one half inches is ideal in this case. In other words, when the lawn reaches a height exceeding this, mowing should take place with a mower set at that level. This mowing height should be reduced to 1-1/2 to 1-3/4 inches during the late summer and into the fall.

It is impossible to say that mowing should take place every week or every two weeks. This will depend upon the weather. During wet periods the lawn will grow faster than during dry ones. It will also grow faster immediately after fertilization. Lawns should be mowed as long as they grow into the fall.

Because of the problem concerning thatch build-up, lawn clippings should be collected and composted (see section on composting). While it is no doubt true that neither Longfellow nor Olmsted collected lawn clippings, today, when we are trying to maintain a healthy lawn against modern day stresses, it is important to compromise and do so. Too much thatch forms an impenetrable layer that prevents absorption of water by the soil.

The lawn should be thatched as needed (usually once every two years)
in spring with a verticutting/slicing machine which cuts through the thatch into the soil. Power rakes may remove debris from the soil but they do not necessarily remove thatch.

An average lawn may not need aerating but lawns at historic sites often do because visitors walk across them and thus compact the soil. The ideal time for soil aerating is in the early spring (April) and in September.

Fertilization, another soil related practice, should be done according to soil test recommendations. Soil from both sites should be sent for testing in the late autumn before it freezes. Samples (about one half cupful) should be taken about three inches below the surface from at least ten places throughout the site. These should be mixed together and from this mixed sample about a cupful should be sent in for testing.

When you receive your report from the soil testing laboratory at least three items will be recorded: (1) nutrient levels and pH; (2) recommendations for fertilizer and lime application; (3) how often to apply each during the year. The fertilizers recommended are usually high in nitrogen in relation to phosphorous and potash (3-1-2, 2-1-1, 4-1-2 ratios).

Recommendations will usually suggest a spring feeding, another in September, and still another in November. Lime may be applied anytime that the soil is not frozen but it must be remembered that it will take several months for results to be effective.

While with home lawns it may not be necessary to test the soil every year, on historic sites yearly soil testing is critical because we are trying to maintain lawns at their best since they receive so much wear and tear through visitor traffic. It is better to manage a lawn based on soil tests than through a hit or miss program of applying lawn fertilizers three
times during the season without specifications as to what grade to use and when to apply it.

Water is another soil related factor that must be considered. Without water, plants will not grow. Without it plant cells dry up, and water is also necessary to carry nutrients to these cells. The function of water in plants is very complex, and it is important to keep water at an optimum level in the soil. An application of one inch of water per week is ample in most cases unless natural rainfall is abundant.

Overwatering, on the other hand, can be just as bad as under-watering. When a soil becomes water-logged it does not permit proper aeration, and plants will also wilt and eventually die. The correct water level is critical to plant growth, be the plants lawn grasses, perennials, shrubs or a tree. The rule to follow is that if the soil is moist at a level of three to six inches in depth for lawns, do not water. If it is dry, then water. The sprinkler should be left on long enough to water deeply, to three-six inches. As mentioned above, one inch of actual water applied each week should satisfy these goals.

It is best to program sprinkler systems so that watering occurs in the early morning before visitation begins. Watering in the evening may leave the lawn wet which will encourage disease growth.

**Perennials and Roses:** In perennial gardens soil must be amended with organic material on a regular basis. One of the best materials to use for this on an historic site is well decomposed compost (see below). While mulching during the summer with peat humus, pine bark, or other similar materials is a relatively modern practice, mulching with compost or well-rotted manure is an old garden practice. This should be done and then at
the end of each season the mulch may be worked into the soil, through careful, deep cultivation, thus improving its condition.

Compost mulch should be spread to the depth of about three inches throughout the perennials bed in the late spring, with a fork, and any clods broken up during the spreading process. While it is important to break up large clods, care should be taken not to pulverize the compost or it will not work as well as a summer mulch. You should strive for an average particle size of one inch.

In working compost into the soil at the end of the season care should be taken not to disturb plant roots. A good way to work the compost-mulch into the soil is by inserting a spading fork into the soil about three inches in depth and then gently turn it to the right, or left, bringing some fresh soil to the surface. Then the whole area should be smoothed over with the tines of the fork. DO NOT GET CLOSE TO THE ROOTS OF PERENNIALS. You can tell when you are because the soil will be fibrous with roots.

Winter mulching is important to keep perennials from heaving as a result of the freezing and thawing of soil. But winter mulches are also useful as a means of adding organic material to the soil. The same types of mulches used in summer may be used here as well. They should be applied in late November and then they may be added to in the spring, if there is not enough, to act as a summer mulch.

With annuals the entire soil surface may be spread with decomposed compost before they are planted and the compost may then be turned or spaded into the soil. It is easier to add humus to the soil in annual beds than in perennial gardens.

When perennials are reset this is the time to add significant amounts
of organic material to the soil (see below). As perennials are dug and set aside, spread the area with three to four inches of compost and spade it into the soil just as with annuals (above). And in each hole where the perennials are to be returned, two or three shovelsful of compost should be worked into the soil.

Perennials should be fertilized according to soil test recommendations. Soil samples should be taken from a depth of three to six inches from about ten places in the garden. These should then be mixed together and a representative sample (about one cupful) sent to the laboratory. If there are problem areas, representative samples should be taken from them and sent in separately.

The results of soil testing will suggest the addition of a complete fertilizer if fertilizer is needed at all. However, the ratio will be different from that recommended for lawns. It will probably be a 1-2-2, such as 5-10-10 or an equivalent type. The normal rate of application is 3-4 pounds per 100 square feet of garden area, but the soil test report may suggest variations. Lime may be needed as well to keep the pH level to the desired level. It may not be necessary to add lime every year, but fertilizer is usually needed in the spring as growth begins and again in the early summer (see Section B).

As with lawns, maintaining a moist soil is essential for the good growth of perennials. During the times that these gardens were maintained by their original owners they probably were not watered on a regular basis during dry periods. But today we compromise in an effort to show the garden plants not as show specimens but as their owners would have seen them during optimum growing seasons.

The watering program should be managed so that the soil is watered
thoroughly to the depth of six inches, even if it dries out slightly between waterings. The objective is to encourage deep root growth. Shallow roots dry out faster and thus the entire plant suffers. As with lawns, care should be taken not to overwater. One inch of water applied per week, when natural rain is absent, should suffice.

**Shrubs and Trees:** Once a tree has been planted it is virtually impossible to add amendments to the soil. At the time of planting it is sometimes desirable to dig a whole two to three times larger than the tree's root ball and to add a good top soil and organic matter as backfill. For each four shovels of garden soil, one shovelful of compost should be worked into the mixture.

This practice is good for shrubs as well but, in addition, shrubs will benefit from mulch applied to the soil around their root systems. As this decomposes organic matter is added. In the case of groundcovers grown between shrub plantings (of which there are many such instances at the Olmsted site), it is impossible to add mulches. The groundcovers themselves will collect leaves, some of which may be allowed to remain to decompose.

When mulches are left on shrub plantings indefinitely, care should be taken to remove some of the mulch around tender azaleas, in the fall, so that the base of the stem may condition to the cool weather. There have been instances where the base of the stem has been kept too warm, keeping the plant tissue too tender and thus subject to severe freezing.

As with all other plants, soil samples should be taken from shrub beds and from around tree plantings. Methods for taking these are the same as for lawns and perennial flowers. The range for taking them is, for trees, in a band about three feet wide under the drip line (directly under the
outer branch tips). For shrubs, the feeder roots are mostly under the outer branches, so this is the range for taking representative samples.

Trees will probably obtain all of the fertilizer they need from normal lawn feeding if they are planted in a lawn, but for those planted in large borders it will be necessary to take special samples.

As with all other plants, shrubs and trees should be fertilized according to soil test recommendations. Usually, complete fertilizers are suggested having a 2-1-1 ratio. Sometimes 1-1-1 ratios are suggested for special situations. Applications are usually made in the spring when growth begins and again in early summer (see Section B).

Soil pH is critical with shrubs. Ericaceous plants (Rhododendrons, Azaleas, Kalmias, Leucothoe, Andromeda, Enkianthus) require acid soil. Other plants such as lilacs require a soil almost neutral. Lime will not be necessary for those requiring acid soils while those needing almost neutral soils will need lime every three to four years. Consult the schedule in Section C for specific pH requirements.

The same principles apply for soil watering as with other plants. With broad-leaved and needle-leaved evergreens it is critical to continue watering until the ground freezes. For these plants there must be sufficient water in the soil because they give off water through their leaves throughout the winter months. When they reach the point of dry soil in winter, the leaves will then dessicate and die. Much winter damage is caused in this way.

Composting: Making compost in order to produce decomposed organic matter to use as a soil amendment is an important part of landscape maintenance. It is an old practice and, along with the application of barnyard manure, was very common in the 19th century. Today barnyard manure is
difficult to obtain, and visitors to historic sites often find it offensive. For this reason, producing compost is an important practice because it is an authentic, inexpensive, and ideal way to produce organic material.

Make compost piles large enough so that proper bacterial action can occur. A pile 8 x 10 feet is ideal. You may want several. Snow fences, wire fences, or boards may be used to make a bin for holding the compost, or it can be free standing.

To build the pile, make a layer of organic material about six inches deep. This should be material such as leaves and green matter from the garden or lawn (see sketch). Do not use diseased or insect-riddled material or weeds that have gone to seed. Woody material is undesirable because it decomposes too slowly.

Sprinkle a 2-inch layer of garden soil over the organic material. This helps to inoculate the pile with beneficial microorganisms. Then sprinkle a complete fertilizer and some ground agricultural lime over the soil. A fertilizer such as 10-10-10 is ideal.

The next step is to add more organic material and continue the above procedure until the pile is 3 to 4 feet high. Let the pile soak up moisture over winter. In the following spring, cover the entire pile with black plastic and weight down the plastic with boards or stone around the base. By the end of the season you will have good compost without even turning it as was the old practice.

If the pile cannot be made in a hidden location, do not use the plastic but, instead, turn the pile several times during the summer season to get even decomposition.
3. **Care of Landscape Plants**

**Lawn Grasses:** Since the lawns at both the Olmsted and Longfellow Historic sites are established, any lawn planting will be repair. This may be done in two ways: patch seeding or sodding. In the former, grass seed is purchased and sown on a prepared seed bed. In the latter method strips of sod are purchased and laid down.

During the late 19th century grass seed mixtures consisted of either chaff (sweepings from a hay mow), or when seeds were purchased, the mixture made up was rather coarse and consisted of the following: White Clover, Fescue, Perennial Rye Grass, Red-top, Timothy, and sometimes even Red Clover. While a mixture like this would be authentic, lawns of these grasses are difficult to maintain and they do not withstand foot traffic as well as some of the modern mixtures. Also, White Clover tends to attract bees and is slippery and stains clothing.

As with mowing heights, compromises are made with lawn grasses. While it is not recommended that modern hybrids be used, a lawn seed consisting of a mixture of making up 40% of Kentucky Blue Grass, 25% Fescue and 25% perennial rye is recommended. This mixture will adapt to either sun or shade, have some degree of coarseness, and yet the lawn will withstand visitor traffic. The other twenty percent may be made up of perennial Rye grasses, annual Rye grass, or other stabilizing grasses. If sodding is done, however, you will have to accept more modern grass hybrids.

While grass mowing and cutting was discussed in the last section, it bears repeating here. You should strive to set your mower height at two and one half inches. During the heat of the summer, the height should be no lower than two inches. The mower may be lowered to 1-1/2 to 1-3/4 inches in late summer and fall. While the tendency is to reduce the height
of cut grass as close as possible, lawns should not be shorn too closely or they will deteriorate in quality. Also, since in the late 19th century and up to World War II, people did not shear their lawns as closely as we do now, two and one half inches is a good compromise height, one that will also withstand visitor traffic and not build up too much thatch.

Lawn clippings should not be allowed to fall on the lawn area. They should be collected and composted. The reason for this is that, if they are allowed to fall thatch will build up rapidly and thus deteriorate the state of the lawn. Also, clippings adhere to peoples' shoes and are tracked into the building. Granted, clippings were probably not collected in period but this is another compromise.

In period, lawns at both the Olmsted and Longfellow sites were no doubt mowed with a reel mower. This type of mower would produce the most authentic appearance. Yet, one cannot mow as efficiently with a reel type mower. It is easier to cut close to trees, garden edges, walk and drive edges, and all similar spaces with a rotary mower, so again, a compromise is made.

With a proper feeding and liming program, as well as adequate irrigation, lawns at both sites should grow well and thus prevent heavy infestations of weeds. Lawn weeds on both sites are to be accepted, mowed off, just as they would have been in period. Concern over weeds in lawns, such as dandelions, plaintain, etc., is a post-World War II mania. Before that time they were more generally accepted except in very refined places such as central lawn panels in a formal garden.

At the Frederick Law Olmsted site goutweed invasion in the lawn, as well as some other weeds, has been observed. These are to be accepted and mowed off. Should certain areas become too thick, then the areas should be
treated with "Round-up" and then reseeded. It is quite obvious that when F.L. Olmsted, Jr. introduced such plants as this, and when his father introduced blackberry, they were more interested in the effect they would create than what they would do to the lawn.

During the growing season, lawns should be checked between mowing to remove debris that has blown into the properties, or small limbs and leaves that have fallen from trees or shrubs. When autumn begins, fallen leaves should be raked regularly. It is expected that some leaves will be on lawns during this season, but when they start to accumulate they must be removed lest they cause suffocating and matting of the lawn grasses. It is also important to remove leaves (and compost them) so that lawn mowing may continue as long as the grasses grow. As we go into winter, the lawn should be one and one half inches in height.

Trees: In addition to the feeding of trees mentioned in the previous section, they must be cared for with regard to pruning. In the Job Description for these two sites it states that Park Service employees must not do tree work higher than fifteen feet off the ground. This means that tree maintenance experts will have to be employed to prune trees when they have rubbing or touching branches, weak growth, damaged limbs due to weather, or diseased limbs, or structural hazards. Trees must be observed carefully so that any irregularities may be noted and proper care arranged.

At both the Longfellow and Olmsted sites the American Elm must be under constant care for Dutch Elm disease. The trees must be pruned of any damaged or dead wood. If there is any indication of Dutch Elm disease, samples should be sent to the shade tree laboratory at the University of Massachusetts. It will be necessary to see the tree experts perform their work according to specifications. (See Elm (Ulmus) in Section C.)
When older trees die out or are destroyed by storms, they are replaced with the same species. It is impossible to maintain a nursery containing samples of every plant on the two sites in question. A nursery should exist to grow replacements for plants that are very weak or very old. For example, seedlings of the large Longfellow site (or the pyracantha at the Olmsted site), should be selected from the crotches of the tree where they now grow and planted so that one may be selected as a replacement when the old tree is removed. The nursery should strive to the extent possible to make replacements with cultivars.

When new trees are planted they should be planted according to the procedure mentioned previously. The hole should be at least twice as wide as the root ball with ample organic matter worked in. The tree must then be carefully tamped and the tree staked with three inch sapling poles of cedar or a similar material. There is twofold: (1) to keep the tree erect until solid root growth occurs and (2) to stake the tree in a manner of the period. Ties for staking should be 3/4 inch hemp rope.

**Shrubs:** Shrubs must be planted in a good sized hole allowing for the soil available. For a plant in a ten inch pot, dig a hole two feet across and 18 inches deep. If the soil removed is poor, improve it by adding good, rich topsoil or discard it completely and fill with all new, good soil. Compost or well-rotted manure may also improve the soil.

Remove plants from metal or plastic containers with utility knives. Some containers have sliding bottoms that may be pushed up and the entire root ball removed in one piece. Others do not have this built-in feature.
removing the plant becomes more difficult. If the soil ball does not slide out when you invert the container and tap its base, cut the pot with heavy-duty shears.

In theory, peat pots and burlap can be planted right into the soil with the plant, but observe a few precautions when using peat pots. First, thoroughly soak the container and the soil within before planting. Or better yet, soak the pot, and without injuring the roots within, make several slits with a knife down the sides of the pot, but do not try to remove it. With pots that have rims, remove them down to soil level to prevent the rim from acting as a wick and drying out the soil around the roots. This procedure is necessary because the peat pot may dry out after planting and become unusually hard preventing water absorption and penetration of roots through the pot into the soil. Many peat-potted plants are lost because of this. With burlap, make sure it is untied.

Tar paper, or paper or plastic pots should be removed from the soil ball. Never plant them in the soil.

Always make sure to plant shrubs (roses included) at the same level at which it grew in the pot. Many shrubs are killed by being planted too deep or too shallow. When replacing the soil in the hole, fill the hole half full, tamp the soil down and thoroughly water it. Allow time for the water to be soaked up. Then fill the hole with soil, tamp and water again.

It is wise not to fertilize shrubs at the time of planting, especially since some nurserymen pre-fertilize them before they are sold. Fertilizer placed into the hole at the time of planting can injure new roots. Therefore, just plant the shrub, let it show signs of growth, and then fertilize it.
**Shrub Pruning:** There are four main reasons for pruning shrubs. First, we prune to restore the shape of the plants. We are all familiar with the forsythia that produces a branch or two that take off halfway across the yard. These should be removed so that the plant is restored to its typical vase-like shape.

Secondly, shrubs are pruned to remove excess wood such as weak and crossing branches. Branches that cross and rub are undesirable because in so doing the bark is injured thus providing an excellent spot for dehydration, and invasion by insects and diseases. All branches that rub must not be removed or the result will be a shrub possessing only one limb. Only the larger branches that produce the worst rubbing damage should go.

Limbs that have been damaged by disease, insects, or storms must also go. If they are allowed to remain, they too will serve only as a harboring spot for pests. Also remove any branches which may cause visitor hazard.

Lastly, and perhaps most important is renewal pruning. This is done to rejuvenate a shrub and keep new wood coming along and in proper balance with the old. A shrub that is never pruned will end up with a high percentage of old wood that eventually does a poor job of flowering. For this reason, renewal pruning is important.

Renewal pruning consists of removing one-fourth to one-third of the old wood each year. These limbs should be taken out right close to the ground. No stubs should remain. Some shrubs such as viburnums and lilacs have few upright stems. Most of the branches on these shrubs are secondary, coming from a main stem as laterals. Here then, renewal pruning is not as important as with spirea, but still, new shoots should be encouraged to eventually replace the old ones. Of course, with plants grafted onto a single root-stock, only branches above the graft should be pruned out.
As with any other major operation, the proper tools are good set of hand pruners are essential for wood up to three inches in diameter. Then you must graduate to long handled clippers for the larger wood. When the diameter of the branch exceed quarter inches, you must then use a pruning saw. Use only single teeth on one side of the blade. Some pruning saws have teeth on both sides, but these are difficult to use since the side not in contact damages adjoining desirable wood while you are removing under branches. Curved bladed pruning saws are the best for pruning.

When you are removing limbs from a shrub or tree, cut either to a good lateral node or to the main branch. Cut to the swollen collar. Stubs only dry out and serve as an entry for pests. Cuts that are made close to the remaining stem of the plant are the best for pruning and cutting flowers.

Flowering shrubs should be pruned immediately after they flowered. For some of our shrubs like lilac, this means they should be pruned in late May or early June. Spring-flowering shrubs should be pruned in the winter time such as many people do. If we prune in the summer, we remove the potential flower blooms so that there will be as many.

Flowering shrubs will be setting buds for next year in the summer, so by pruning them at this time of year, you will prevent any of your potential blossoms. This means also that not all spring-flowering shrubs will be pruned at the same time. One example of this is Clematis. These should be pruned in the very early spring growth begins to shape the vine.
The best time of year to prune evergreens such as yews, or any other evergreens is in winter or early spring before they make their new growth. If we prune the evergreens immediately after they make their new growth, they look sheared or clipped through most of the summer. So we like, especially with plants arranged in a hedge-like manner, to prune them just before the new growth starts. In this way, they will look fuzzy when the new growth comes and they won't look all summer long as if they had been to a barber shop.

Somewhat related to pruning is the practice of cutting into the stem of a Dogwood or a Wisteria to make it flower. THIS PRACTICE SHOULD BE EMPLOYED ONLY AS DIRECTED BY THE SITE SUPERVISOR AND AS A LAST RESORT! Both these plants, oftentimes as a result of an imbalance in the soil or just after planting, go into a "stubborn period" and will not flower. Sometimes if the trees are fed with superphosphate flower buds will form. This should be done in the late spring. But if that does not work, in early July at a point on the stem below where branching begins, take a sharp knife and cut into the wood cutting through the bark and just into the stem. Cut all the way around the stem BUT DO NOT LET THE CUT MEET. In other words, cut as though you were spiraling around the stem. The following season the plant should flower because carbohydrates produced in the upper portion of the plant are trapped there temporarily thus assisting in the formation of flower buds.
DECIDUOUS SHRUB PRUNING
EVERGREEN SHRUB PRUNING

SHRUB

TWIG TIP
TO REMOVE
APPLE
PEAR
WISTERIA
FLOWER SPURS
Garden Perennials and Annuals: All garden flowers should be planted in soil of tilth meaning that the existing loam has been enriched with compost as outlined earlier. When this has been accomplished, the flowers should be planted in the soil at the same level at which they grew in the nursery or greenhouse. Planting too deep or too shallow will retard the growth of the plants. Some plants, especially Petunias and Verbenas, suffer in this regard. Care should be taken at the time of planting to press the plants in place being careful not to break off roots. This will establish needed contact between roots and soil.

Spring flowering bulbs or lilies are planted to a depth determined by the diameter of the bulb. A good rule of thumb is to plant these three to four times their diameter in depth. Daffodils, tulips, hyacinths, and all of the larger spring flowering bulbs should be spaced about a foot apart. The smaller ones, such as scilla, crocuses, chionoxias, snowdrops, and those of similar size, may be planted six to eight inches apart. Summer flowering lilies are best spaced twelve to eighteen inches.

It will be observed in the calendar of garden activities, Section B, that perennials should be fertilized once in the spring when growth begins, and once again in the early summer using a complete fertilizer (see above). While some advocate fertilizing once again in the late summer, it seems best not to force the plants to this extent and risk tender growth into the fall. For this reason, no fertilization should occur after the 4th of July.

With spring flowering bulbs the time to fertilize is in the spring when they are in full leaf. Fertilizing after they have flowered is not as effective. It is also desirable, with new plantings, to feed at the time of planting using a high phosphorous fertilizer such as 5-10-10.
Annuals, such as Heliotrope, petunias, snapdragons, or any spikey plant, pinching the seedlings after they first begin to grow yields a bushier plant and one that is showy because of additional blossoms. This should be done unless long single spikes are desired. Pinching out the one-half inch of the terminal growing point encourages lateral shoots to grow and develop. Certain perennials, such as chrysanthemums, may also be pinched for bushiness, but this should not be done after July 4th.

When flower heads have gone by, the flowers should be removed immediately after the flowers fade. This is called "dead-heading." In the case of Phlox, Chrysanthemums, Goutweed, Lupine, Larkspur, and many other perennials, if allowed to go to seed, the seed will germinate in the soil and plants will be produced that do not have flowers which are true to variety. In other words, the flowers revert back to a poor color which crosses with the good varieties and eventually no distinct varieties will remain. The seedlings, also, may become pests. This causes headaches, heartaches and the expense of replacing the varieties again. If flower heads are removed immediately after the flowers go by, the problem may be prevented. In the case of Phlox, Foxgloves and Hollyhocks, if the flower heads are removed and the plants cut back, they may produce lateral shoots which will bloom again in early fall. This provides extra beauty for the same amount of work.

Keeping plants free of weeds in the summer is a constant chore. The use of summer mulches in the form of compost, an old garden practice, is useful in keeping weeds down. Nevertheless, the surface of the mulch may sometimes need cultivation to loosen it up and also to remove stray weeds. Groundcovers are useful in weed prevention in shrub planting, but the
groundcovers themselves have to be checked for weeds on a regular basis, and they should not be used unless they are historically correct.

As taller plants grow they may need staking. If the plants are well protected from winds, such as the hollyhocks growing against the building at the Longfellow site, they may not need to be staked, but most tall plants in the open (hollyhocks, delphinium, dahlia, heliotrope, lupine, foxgloves, clockvine, canterbury bells, peonies, lilies) may need staking.

In staking plants, be sure that the stake is sturdy enough to do the job. These may be purchased at practically every garden center, but if you have access to lots of land you may like to cut saplings from over-grown pasture land or the edges of forests. These look quite natural.

There is one trick to tying up the plants in that the twine you use should be tied securely to the stake, not to the plant. The loop you put around the plant should be loose so that the plant will have room to grow and to give a little with the breezes. Baling twine is a strong and authentic material to use. Aside from using a good and sturdy twine (like baling twine), stakes should be saplings (1-2" in diameter), or square cut wood of oak 1-1/2" x 1-1/2" (in diameter).

Lawns have a tendency to spread in flower gardens creating a visually uneven edge to the garden. At least once each year it is important to recut the edge with an edger. Before edging is done, a string line should be strung and followed carefully so that the edge will be straight and perfect. With curved beds lay cut a flexible hose or rope and follow it. You must take care not to enlarge the beds in so doing. It is a good practice to drive stakes into the ground, flush with the surface, to mark the original corners.
APPROPRIATE STAKING

BINDER TWINE

TIED AROUND STAKE
As perennials grow over the years the clumps become too large in diameter and spread together. In so doing, some perennials, such as gas plant and Siberian iris, push themselves out of the ground. When this occurs these perennials must be dug and divided. Under normal circumstances we would advise dividing the clumps down as much as possible so that the new clumps would be about the size of a clenched fist. But in historic gardens, the new clumps should be about six to eight inches in size so that they will bloom quickly and thus be effective.

Certain perennials, such as gas plant (Dictamnus) and peonies, should be left undisturbed. Actually, any plant, which is growing well and is too large or heaving itself from the ground, may be left in place.

Bulbs need not be divided until they become too thick. Perennial doubles, in daffodils may suddenly stop flowering if they are too large or heaving itself from the ground, may be left in place.

Vines: At both the Olmsted and Longfellow sites are vines, trellises on the barn at Longfellow, and also against the barn front. Care must be taken to train these vines on their support. Suitable supports for these vines are shown on the accompanying plans.

At regular intervals (every two weeks or so) you should thin the leaders on the support. If there are too many leaders due to growth, some of them should be thinned. In the case of Clerodendrum, the leaders should remain, but in the case of more rampant Virginia Creeper and Wisteria, some of them may be thinned (every quarter).
4. **Observation**

The calendar in Section B lists the chores required to maintain the two sites. Material contained in this section indicates how this work is to be done and why. In addition to these, constant observation should be done on the site by the head gardener to see that everything is being performed as it should, that all plants are healthy and growing well, and to generally check the site.
OVERLAPPING VINE SUPPORT WICKETS
LONGFELLOW SITE
TO BE PLACED 6" FORWARD OF FRONT BALUSTRADE FOR WOODBINE

SECTION

STAKE 18" IN GROUND

VINE SUPPORTS
SCALE: 1" = 1'0"
SECTION B - WEEKLY CALENDAR OF GARDENING ACTIVITIES

GENERAL CHORES: The following general chores do not relate specifically to any week or month: litter removal; snow removal; raking gravel if they need it; checking drains for performance; checking for virus; deadheading of flowers; weeding driveways and walks; sanding drives. (F = Fairsted; L = Longfellow)

NOTE: Recommendations for pesticide use anywhere in this text are exempt Park Service staff from obtaining annual approval as required by National Park Service policy.

JANUARY

2nd week
Check perennial gardens. Press heaved plants If weather is suitable, remove dead or broken from plants, beds, or lawns.

3rd week
Check summer bulbs in storage to see that they are retaining turgidity if you have them on-site.

4th week
Prune damaged or broken limbs from trees and prune so-called bleeders--maples, birches, (See Diagram, pg. 19 for grapes.)

FEBRUARY

1st week
Engage or contract with tree care companies work on trees for this year (pruning), and

2nd week
Plan seed starting operation if any are to Order seeds and plants according to needs restoration plans for the garden. Order lime based on soil test reports. Order and order other materials.
3rd week

Check tools and see that they are in working order. Also inventory tools to make sure they are adequate for the season. Prune apples, pears.

MARCH

1st week

Do not remove winter mulch now (See April) (L). Observe winter damage on shrubs and remove now. Make notes and check again later in month to note progress.

2nd week

Rake lawns, remove broken limbs, branches from shrubs and the ground within the shrub beds.

3rd week

Lime lilacs if soil test indicates the need (L). Lime any other shrubs that may need it (F) (see Section C).

4th week

Clean out all drains on the site. These should be checked throughout the season after all big storms. Apply dormant oil to roses and any other plants with problems indicated in Section C -- mites, sucking insects. Remove old flower trusses from hydrangeas (F). Prune climbing hydrangea (F) to keep below second story of vault. If snow mold appears on lawn, brush affected areas with a broom or wire rake. Remove leaves and debris from shrub beds. Test soil if you didn't get to it last fall.

APRIL

1st week

Prune roses. Divide those perennials that need it. Resurface gravel walks that need it.

2nd week

Thatch and aerate lawns if needed. Fertilize and lime lawns according to soil test recommendations. Remove mulch from perennials when the daffodils are in bloom. Do not remove winter mulch from roses until the Darwin tulips bloom.
3rd week
Re-seed bare spots in the lawn. Set mowers at 2-1/2 inch mowing height and mow lawns when they exceed 2-1/2 inches. Begin patch seeding or over-seeding for lawns where needed. Apply milky-spore control if grubs have been a problem. Fertilize roses and shrubs using a complete fertilizer (5-10-10). Fertilize rhododendrons, azaleas, pieris, leucothoe, and kalmia with chelated iron if the leaves are yellowed with dark green veins. Follow directions on the package. Mulch these with peat, compost or other acidic organic materials (3-4" deep).

4th week
Plant trees and shrubs that are needed. Prune any flowering shrubs that have already flowered. Divide perennials that need it (see Section C). Plant new perennials/biennials. Watch roses for disease problems from now on. (See Section "C" for controls.)

MAY
1st week
Get watering system in order in case of dry weather. "Dead-head" any gone by flowers on flowers or shrubs. (This should become a weekly chore). Remove winter mulch from roses if the tulips are in bloom. Prune boxwood, both in perennials garden and in front of house (L). Weed under flowering quince (F).

2nd week
Train vines on their supports. Install any new supports that are needed (see sketches, page 22). Prepare soil mixtures for planters (L). Put stakes in place in perennial garden (L). (See sketch for appropriate type, page 21). Start trimming in areas where mowers will not reach (under
fences, along buildings, walls, etc.). Start all beds, flowers and shrubs.

3rd week
Prune spring flowering shrubs that bloomed during the month. Prepare beds to plant annuals and perennials when weather is suitable. Plant tender summer bulbs now. Perform "dead-heading" flowers and shrubs. Fertilize perennial gardens with a complete fertilizer according to test recommendations.

4th week
Spray hollyhocks against rust and phlox again (use sulphur). Also spray roses for mildew if present (L). Check dogwoods, birch, cherries for borers (F). If mildew problem on lilacs, spray with sulphur. Apply annuals gardens as summer mulch (L). Pinch annuals page 20. Continue weeding walks, drives.

JUNE
1st week
Start seeds of old varieties which need to be started now. Start lawn watering if needed, as well as continue weeding in gardens and shrub borders this time. Thin any seedlings or plants that have become too thick. Dead-head pieris (F).

2nd week
Continue training vines on supports and prune unneeded portions. Continue "dead-heading" flowers. Tend compost piles by adding organic matter as required. Continue season (see sketch, page 10). Spray hollyhocks for mildew if present.

3rd week
Prune flowering shrubs that bloomed since
Stake any plants missed last month. Feed roses with complete fertilizer (5-10-10 or equivalent). Continue weeding the gardens, as well as trimming.

4th week
Weed driveways and walks and continue practice as needed. Continue "dead-heading" all flowers and shrubs. Spray phlox and hollyhocks. Prune climbing roses that are not everbloomers. Dead-head lilacs (L). Fertilize broadleaved evergreens. Raise mower height to 2 and 1/2 inches at this time. Keep minimum during summer season.

JULY

1st week
Fertilize all deciduous and needle evergreen shrubs with a complete fertilizer. Fertilize perennials and annuals according to soil test recommendations. Continue dead-heading all plants.

2nd week
Train vines as before. Continue watering operation if conditions warrant same. Spray for mildew as before. Continue watching for insect problems throughout the grounds. Dead-head groutweed (F).

3rd week
Continue weeding, trimming. Remove suckers and watersprouts from bases of trees.

4th week
Go over shrub areas carefully and remove all weeds. Regulate lawn traffic (see sketch, next page). Trim vines to keep in bounds. Trim Arborvitae, False Cypress, Yews (F).
AUGUST

1st week  Weed driveways and gravel walks. Continue "dead-heading." Continue spraying for mildew on hollyhocks and phlox.

2nd week  Train vines as before. Prune any spring flowering shrubs that flowered since the last pruning. Tend compost.

3rd week  Keep up with weeding. Patch seed any bare lawn areas.

4th week  Order spring flowering bulbs. Spray hollyhocks and phlox for mildew. Trim Boxwood.

SEPTEMBER

1st week  Transplant peonies if needed.

2nd week  Continue weeding gardens, shrub beds and gravel walks and driveways.

3rd week  Plant spring flowering bulbs or divide and replant old plantings.

4th week  Plant or transplant any shrubs or trees that need transplanting. Continue weeding. Start raking leaves from walks, lawns, parking areas and gardens, as weeded, on a regular basis. Compost all undiseased leaves. Fertilize lawn according to soil test report. Lower mower height to 1-1/2 to 1/3/4".

OCTOBER

1st week  Continue lawn mowing for as long as the grass grows. Make sure shrubs, especially evergreens, do not suffer from dryness from now until the ground freezes. Keep lawns raked so that leaves do not suffocate the grasses. Take soil test samples and mail them to the soil testing laboratory for testing (University of Massachusetts, Soil
Labotary, 240 Beaver Street, Waltham, MA

2nd week All spring flowering bulbs should be planted.

3rd week Compost leaves and make sure the compost is spread as shown on the sketch on page. Start except around azaleas and rhododendrons.

4th week If frost has come, dig corns and tubers ofing bulbs for winter storage. If not, do so after. Cut back frosted perennials, annuals, and shrubs.

NOVEMBER

1st week Drain the sprinkler system of any other pipe, tubing, etc. Store any left-over fertilizer in clean plastic bags.

2nd week Fill in any depressed areas around trees so they do not collect and freeze. Place 1/4 inch wire around trunks of deciduous trees to keep rodents from gnawing. Wrap tender broad-leaved, evergreen shrubs, such as azaleas and rhododendrons, with burlaps or exposed ones.

3rd week Store any left-over fertilizer in clean plastic bags.

4th week Apply winter mulch to perennial gardens (L).

DECEMBER

1st week Tie up any multi-leaved evergreen shrubs. Clean up all equipment and tools for winter storage.

2nd week Clean up all equipment and tools for winter storage.

3rd week Compost leaves and make sure the compost is spread as shown on the sketch on page. Start except around azaleas and rhododendrons.

4th week If frost has come, dig corns and tubers ofing bulbs for winter storage. If not, do so after. Cut back frosted perennials, annuals, and shrubs.
3rd week

Go over the past year's records and start compiling notes for ordering materials (seeds, plants, fertilizer, lime, etc.) in January. Complete records for the year for maintenance schedule and budget.
SECTION C - SPECIFIC CULTURAL REQUIREMENTS FOR PLANTS AT EACH SITE

Each plant growing at the Frederick Law Olmsted Historic Site and the Longfellow National Historic Site is listed below in alphabetical order according to its botanical name starting with those at the Olmsted site. Where the same plant also grows at the Longfellow site, reference is made to the first listing so as to avoid needless duplication.

Under each plant is listed potential pests that may attack that plant. This is not an exhaustive list of every potential pest but it does list those that are most common. For the control of these pests, THE INTEGRATED PEST MANAGEMENT INFORMATION MANUAL OF THE NATIONAL PARK SERVICE should be consulted. A copy is filed at each site.

I. THE FREDERICK LAW OLMS TED HISTORIC SITE, BROOKLINE, MASSACHUSETTS

NAME: Acer palmatum, Japanese Maple
HABIT: Small Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun.

FLOWERING PERIOD: May-June.

GENERAL CULTURE: Prefers well-drained soil that is not excessively dry. Summer mulching helps.

PRUNING REQUIREMENTS: Prune to keep shape and to remove damaged parts.

DISEASES:
Leaf Spot. Spots 1/4" in diam. are irregular with brownish centers and purple-brown margins.

Anthracnose. Entire leaf often turns black and shrivels.

Nectria Canker. On the trunk these cankers have concentric rings of dead callus tissue resembling a target. No bark in center of canker.

* * *
NAME: **Acer platanoides**, Norway Maple; **Acer psuedoplatanus**, Planetree Maple; **Acer plantanoides 'Schwedleri'**, Rewelder Maple; **Acer pensylvanicum**, Striped Maple; **Acer saccharum**, Sugar Maple

HABIT: Trees

SOIL pH: 5.5-6.5.

FERTILIZER REQUIRED: None required if lawn or bed beneath is fertilized.

EXPOSURE: Sun to partial shade.

FLOWERING PERIOD: Late April/May.

GENERAL CULTURE: Tolerates a wide range of growing conditions. Sensitive to salt damage. The keys or sumaras will fly throughout the grounds and sprout. These should be pulled up before they become established.

PRUNING REQUIREMENTS: Remove damaged or rubbing branches. Prune to keep shape.

PESTS:

- **Anthracnose.** Light brown spots irregular in shape. May enlarge and run together, causing death of entire leaf. Leaves partially killed appear as if scorched.
- **Leaf Spot.** Spots 1/4" in dia. are irregular with brownish centers and purple-brown margins.
- **Powdery Mildew.** Leaves covered with whitish, felt-like patches of mycelium.
- **Wilt.** Sudden wilting and dying of leaves on individual limbs, particularly on one side of tree and a reduction of the size of leaves which turn yellowish. Infected trees may die slowly or suddenly.
- **Bleeding Canker.** Oozing of sap from fissures in the bark. Toxic material secreted by the fungus causes wilting of leaves and dying back of the branches.
- **Maple Decline.** Especially on Sugar Maples because of excessive salt during the winter months.
- **Girdling Roots.** Choking action restricts the movement of nutrients in the trunk. Certain branches show weak vegetative growth and eventually die of starvation.

***

NAME: **Aesculus hippocastanum**, Horse Chestnut

HABIT: Tree

SOIL pH: 6.5 but tolerates wide range.

FERTILIZER REQUIRED: Fertilizing lawn or bed beneath is enough.

EXPOSURE: Sun.

FLOWERING PERIOD: mid-May.
GENERAL CULTURE: Avoid excessively dry conditions. Fruit or "nuts" fall and can become a problem on walks and driveways. Keep them raked.

PRUNING REQUIREMENTS: To remove damaged wood and to keep shape of tree.

MOST COMMON PESTS:
- **Powdery Mildew.** Undersides of leaves frequently are covered with white mold. Fruiting bodies appear as small black dots over the mold.
- **Anthracnose.** Terminal shoots become blighted down to several inches below the buds. Diseased tissue is shrunken and the epidermis and young bark are ruptured; pustules are formed containing the pink spores.
- **Scale.** Many kinds attack the main trunks. Several layers of scales collect in cracks and under the bark.
- **Japanese Beetle.** During hot days of July and August, pests eat top and south side. Tree looks scorched, only the leaf veins remain.

NAME: Albizia julibrissin, Silktree
HABIT: Tree
SOIL pH: 6.5.
FERTILIZER REQUIRED: Feeding lawn or beds beneath is sufficient.
EXPOSURE: Full sun for best flowering.
FLOWERING PERIOD: May, June, July.
GENERAL CULTURE: Extremely tolerant of a wide range of conditions.
Self sows readily. Volunteers must be weeded out regularly.
PRUNING REQUIREMENTS: Prune to restore shape and to remove damaged wood.

NAME: Aralia spinosa, Devil's Walkingstick
HABIT: Tree
SOIL pH: 6.5.
FERTILIZER REQUIRED: Feeding lawn or beds beneath will suffice.
EXPOSURE: Sun.
FLOWERING PERIOD: Late July, August.
GENERAL CULTURE: Tolerates a wide range of conditions. Very easy to grow without special requirements.
PRUNING REQUIREMENTS: Prune to remove rubbing and touching or damaged wood, and to keep desired form.

***

NAME: Berberis vulgaris, European Barberry HABIT: Deciduous Shrub

SOIL pH: Tolerates wide range from acid to neutral.

FERTILIZER REQUIRED: Regular as described in text.

EXPOSURE: Full sun is preferred.

FLOWERING PERIOD: April-May.

GENERAL CULTURE: Tolerant of a wide range of cultural conditions though it prefers a well-drained sandy soil. Will seed itself and seedlings will emerge throughout the property. Must be weeded out. Plant is especially attractive while in fruit in the autumn.

SPECIAL PRUNING REQUIREMENTS: Renewal as described in text.

***

NAME: Betula lenta, Sweet or Black Birch HABIT: Tree

SOIL pH: 5.5-6.0, tolerant of broader range as well.

FERTILIZER REQUIRED: Feeding adjoining areas, lawns or beds, will suffice.

EXPOSURE: Sun or shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: Will grow in a wide range of soils but rich, moist and acid soils are desirable.

PRUNING REQUIREMENTS: Prune to restore shape and to remove damaged wood.

DISEASES:
Canker. Fungus attacks branches near the forks and causes very irregular swellings which crack open and expose the wood. Cankers on trunks cause a flattening and bending of trunk at canker. When trunks are girdled, death results.

***

NAME: Betula papyrifera, White Birch, Paper Birch HABIT: Tree

SOIL pH: 6.0.

FERTILIZER REQUIRED: Feeding lawn or bed in area will suffice.
EXPOSURE: Sun.

FLOWERING PERIOD: May.

GENERAL CULTURE: Must have well-drained, sandy soil. Not a strong tree and can break up in storms. During winters when heavy snow occurs it may be necessary to prop up branches with forked saplings that have been prepared in advance, or to shake off snow as soon as it falls.

Watch base of trunk for possible gridling roots. If they occur they should be removed.

SPECIAL PRUNING REQUIREMENTS: Prune to keep desired shape or to remove damaged parts.

MOST COMMON PESTS:
INSECTS:
Birch leaf miner. Insects mine beneath leaf epiderm and leave a dried out blotch.

DISEASES:
Canker. Fungus attacks the branches near the forks and causes very irregular swellings which crack open and expose the wood. Cankers on trunks cause a flattening and bending of trunk at the canker.

***

NAME: Buxus sempervirens, Common Boxwood
HABIT: Evergreen shrub

SOIL pH: 6.5-7.0.

FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Sun or partial shade.

FLOWERING PERIOD: Late spring.

GENERAL CULTURE: Mulch roots to keep cool and moist using compost or leaf mold. Do not cultivate around roots because they are close to the surface. If the shrub is located in path of a driving winter wind, protect by erecting a burlap or twig barrier to cut down on the force of the wind.

PRUNING REQUIREMENTS: Clip to keep shrub in balance and at desired height.

MOST COMMON PESTS:
Canker. Certain branches do not start new growth when others do nor is new growth so vigorous. Leaves turn tan, turn upward and lie close to the stem instead of spreading out. Small rosecolored waxy pustules.
Nematodes. Leaf-bronzing, stunted growth, and general decline.
Giant Hornet. Strips bark from branches.
Boxwood Webworm. Chews leaves and forms webs.
Boxwood Psyllid. Terminal leaves and young twig growth is checked by this small, gray, sucking insect covered with a cottony or white, waxy material.

Leaf Minor. Blister-like lesions on leaves.

** * * *

NAME: Calycanthus floridus, Strawberry Shrub
HABIT: Deciduous Shrub
Sweet Shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun or slight shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: A well-drained, sandy soil is most desirable although the shrub is highly desirable. The shrub forms large fruits in the fall that are of interest but it is best to remove them for even flowering over the seasons.

PRUNING REQUIREMENTS: Renewal pruning is essential.

** * * *

NAME: Carya ovata, Shagbark Hickory
HABIT: Tree

SOIL pH: 5.5-6.5.

FERTILIZER REQUIRED: Feeding of lawn or beds beneath is sufficient.

EXPOSURE: Sun, partial shade.

GENERAL CULTURE: Adaptable to a wide range of soils but a rich, well-drained soil is preferred. It is difficult to grow other plants beneath them. When the nuts fall it is important to collect them if visitors will be walking beneath the trees.

PRUNING REQUIREMENTS: Prune to keep shape and to remove damaged parts.

DISEASES:
Leaf Spots. Large irregular spots which are reddish-brown on upper leaf surfaces and brown on the lower. Margins of spots are not sharply defined. Minute pustules appear on lower leaf surfaces.

** * * *

NAME: Chamaecyparis obtusa, Hinoki False Cypress
HABIT: Evergreen shrub

SOIL pH: 6.5.
FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

GENERAL CULTURE: Well-drained, moist soil. Summer mulching is text).

PRUNING REQUIREMENTS: Requires very little, only to remove dead

INSECTS:

Mites. Microscopic insects that suck on undersides of th

NAME: Cladrastis lutea, Yellowwood

HABIT: Tree

SOIL pH: Tolerates acid or alkaline soils.

FERTILIZER REQUIRED: Fertilization of lawn or bed beneath is

EXPOSURE: Full sun.

FLOWERING PERIOD: Late May or early June.

GENERAL CULTURE: Do not move young one's bare root, always ol

tainer or balled and burlapped specimens.

SPECIAL PRUNING REQUIREMENTS: Prune to keep desired shape.

develops crotches which can br

Encourage strong crotch growth young through proper pruning.
trees, remove weak wood. Prun
or in early winter as tree ten

NAME: Clethra alnifolia, Summersweet

HABIT: Deci

SOIL pH: 4.5-6.0.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Partial shade.

FLOWERING PERIOD: Late July.

GENERAL CULTURE: Definitely requires a moist soil. Will gr

conditions but will not flower or grow as
the soil during summer helps to add organi
soil and to keep it moist.

PRUNING REQUIREMENTS: Renewal pruning is essential.

* * *
NAME: Cornus florida, Flowering Dogwood

HABIT: Tree

SOIL pH: 5.5-6.5

FERTILIZER REQUIRED: Feeding bed or lawn beneath is sufficient.

EXPOSURE: Sun or partial shade.

FLOWERING PERIOD: Mid-May.

GENERAL CULTURE: Summer mulching is desirable to keep soil moist and cool. Must have a well-drained soil.

PRUNING REQUIREMENTS: Remove dead or damaged wood and also any shoots growing from base.

MOST COMMON PESTS:
- Dieback. Branches die.
- Flower and Leaf Blight. In rainy seasons this fungus causes white flowers and rot of the leaves onto which the botanists apply a fungicide.
- Leaf Spots. Many species of fungi cause leaf spots on the leaves. The leaves become yellow and fall off. But this is not a serious problem.
- Borers. Twig and tip. Borers invade tips of twigs causing the leaves to wilt and appearance. Borers also enter the stems at the point where they connect to the main stem.

NAME: Cornus kousa, Kousa Dogwood

HABIT: Small Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Late June but bracts persist for as long as they wish.

GENERAL CULTURE: Requires a well-drained, sandy soil into which organic matter has been incorporated. Will not tolerate excessively moist soil.

Fruit is relatively large and soft. As it ripens, it may attract birds, people may walk, rake it up on a daily basis.

PRUNING REQUIREMENTS: Prune to restore shape and to remove any injured branches.

MOST COMMON PESTS
- INSECTS:
  See C. Florida
DISEASES:

Dieback. Branches die.

Flower and Leaf Blight. In rainy seasons this fungus causes fading of white flower bracts and rots the leaves onto which the bracts drop.

Leaf Spots. Many species of fungi cause leaf spots on this host.

***

NAME: Contoneaster apiculatus, Cranberry Cotoneaster
HABIT: Deciduous shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Sun is best but can tolerate light shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: Will grow in a wide range of soils but a light, well-drained soil that retains moisture is best.

PRUNING REQUIREMENTS: Prune to keep desired form and to remove damaged or diseased wood.

INSECTS:

Mites. Feed on undersides of leaves which then turn brown.

DISEASES:

Leaf Spots. Reddish-brown spots bordered by darker zones, outside of which is a zone of Indian red.

Fire Blight. Branches appear as if burned and die.

***

NAME: Crataugus "Toba," Toba Hawthorn
HABIT: Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: May.

GENERAL CULTURE: Prefers a rich, well-drained soil.

PRUNING REQUIREMENTS: Prune to restore shape and to remove damaged parts.

DISEASES:


Aphids. Several species.
Apple Leaf Blotch Miner. In May or June a small channel shows in the leaf which widens to a blister-like area that is light brown.

Rust. See Malus.

Leaf Spots. Fungi cause circular brown blotches on leaves.

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NAME: *Cydonia sinesis*, Fruiting Quince  
HABIT: Deciduous Shrub  
SOIL pH: 6.0.  
FERTILIZER REQUIRED: Regular feeding as described in text.  
EXPOSURE: Full sun.  
FLOWERING PERIOD: Early to mid May.  
GENERAL CULTURE: Mulch soil in summer. Remove any unwanted suckers to keep shrub in bounds.  
PRUNING REQUIREMENTS: Renewal.

MOST COMMON PESTS:  
Rust. Occurs on leaves, stems, and fruit. On leaves it produces small orange-colored spots, on the stem it causes swollen gall-like growths, and on the fruit it appears as circular orange-colored areas which may comprise half the surface area.

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NAME: *Deutzia scabra*, Fuzzy Deutzia  
HABIT: Deciduous shrub  
SOIL pH: 6.0-6.5.  
FERTILIZER REQUIRED: Regular feeding as described in text.  
EXPOSURE: Sun.  
FLOWERING PERIOD: Early June.  
GENERAL CULTURE: Tolerates wide range of conditions except over-watering.  
PRUNING REQUIREMENTS: Renewal pruning after lowering.

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NAME: *Enkianthus campanulatus*,  
*Red-veined Enkianthus*  
HABIT: Deciduous Shrub  
SOIL pH: 5.5-6.0.  
FERTILIZER REQUIRED: Regular feeding as described in text.
EXPOSURE: Full sun or partial shade.

FLOWERING PERIOD: May-June.

GENERAL CULTURE: Requires a humusy, moist, but well-drained soil. The soil must be kept acid as for Rhododendrons, Mt. Laurel, and other ericaeceous plants.

PRUNING REQUIREMENTS: Prune to maintain shape and to remove damaged wood. Renewal pruning is not necessary with this plant.

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SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: May, fruit in fall.

GENERAL CULTURE: Require a rich, well-drained soil. The vines (the first four listed above) require support. Birds carry seeds throughout which grow into seedlings needing weeding out.

PRUNING REQUIREMENTS: Prune to restore shape, keep in bounds, and to remove damaged parts.

MOST COMMON PESTS:
- Anthracnose. Brown lesions on the leaves, in which tiny fungus fruiting bodies may be seen with a hand lens.
- Crown Gall. Both the roots and stems bear good-sized galls.
- Leaf Spots. Ten fungi are capable of causing spots with severe outbreaks occurring during the rainy seasons.
- Dieback. Premature reddening of the leaves, followed by wilting and browning, and then dieback of large branches.
- Scales. Many species infest Euonymus. The most common and destructive is the euonymus scale. The males are narrow and white and cluster in great numbers on the leaves and stems. Females are dark brown.

***

NAME: Gleditsia tricanthos var. inermis, HABIT: Tree
Thornless Honeylocust

SOIL pH: Wide range, 6.5 best.
FERTILIZER REQUIRED: Feeding lawns and beds beneath suffice.

EXPOSURE: Sun.

FLOWERING PERIOD: Late May, June.

GENERAL CULTURE: Tolerates a wide range of soils, though moist, well-drained conditions are best. Large seed pods in fall are of interest but can be messy when they fall.

PRUNING REQUIREMENTS: Prune to restore shape and to remove damaged wood.

MOST COMMON PESTS:
- Honey Locust Borer. Flat-headed borer burrows beneath the bark and eventually may girdle tree. Large quantities of gum exude from bark near the infested nodes.
- Pod Gall Midge. Larvae feed on inner surfaces of leaflets.
- Honey Locust Plant Bug. Discoloration of leaves and stunting of new growth. Complete defoliation may occur during heavy infestations. Seed pods are interesting but messy. Keep picked up on a regular basis.

* * *

NAME: Hedera helix, English Ivy HABIT: Vine

SOIL pH: 6.5 ideal, will tolerate acid soil also.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun to heavy shade.

GENERAL CULTURE: Will grow well in any well-prepared soil (as for perennials in text). Does suffer from winter burning due to wind and sun in highly exposed areas. May need a wind barrier (burlap or snowfence or evergreen twigs laid on top) if winter conditions are severe. Will need pruning or digging out as it grows out-of-bounds.

PRUNING REQUIREMENTS: Clip back to keep in bounds and to keep from growing up tree trunks and shrub stems.

DISEASES:
- Bacterial Leaf Spot. At first spots appear as light green and water-soaked areas. Later they burn brown or black with reddish margins. Leaf stalks also become black and shriveled.

* * *

NAME: Hydrangea petiolaris, Climbing Hydrangea HABIT: Vine, Perennial

SOIL pH: 5.5-6.0.
FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Sun.

FLOWERING PERIOD: Late May–Early June.

GENERAL CULTURE: Prune to keep from climbing above the first floor of the vault at Fairsted.

* * *

NAME: Kalmia latifolia, Mountain Laurel

HABIT: Evergreen Shrub

SOIL pH: 5.0–6.0

FERTILIZER REQUIRED: Regular feeding.

EXPOSED: Partial shade.

FLOWERING PERIOD: Early June.

GENERAL CULTURE: Requires moist soil. Summer mulching is useful. Make sure to keep soil acid or chlorosis of the leaves will occur. Dead-head when flowers go by, being careful not to injure adjoining buds.

PRUNING REQUIREMENTS: Renewal.

DISEASES:

Leaf Spot. Fungus produces irregular or circular, light gray spots with a purplish-brown border. Leaves may fall prematurely.

* * *

NAME: Leucothoe fontanesiana, Drooping Leucothoe

HABIT: Evergreen Shrub

SOIL pH: 5.5–6.0.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Partial shade, through will take full sun if soil is kept moist.

FLOWERING PERIOD: May.

GENERAL CULTURE: Will not withstand severe drought or harsh winter winds. If growing in a windy spot, provide a barrier of burlap or snow fencing.

PRUNING REQUIREMENTS: Renewal pruning by cutting some of the older branches to the ground each year.

DISEASES: Several species of fungi may cause leafspots.

* * *
NAME: Lonicera tatarica, Tatarian Honeysuckle  
HABIT: Deciduous Shrub

SOIL pH: 6.5, bud will tolerate a broad range.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: May, fruit in fall.

GENERAL CULTURE: See ligustrum.

PRUNING REQUIREMENTS: Renewal.

***

NAME: Liriodendron tulipifera, Tuliptree  
HABIT: Tree

SOIL pH: Tolerates wide range.

FERTILIZER REQUIRED: Feeding lawn or beds beneath is sufficient.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: Moist, well-drained soil.

PRUNING REQUIREMENTS: Prune to restore shape or to remove damaged parts.

***

NAME: Ligustrum obtusifolium "Regalianus,"  
Regal Privet  
HABIT: Deciduous Shrub

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: May-June.

GENERAL CULTURE: Tolerant of a wide range of conditions, though it prefers a well-drained soil. Tends to grow vigorously so keeping up with pruning is essential. Prolific seed producer and the seeds tend to self-sow. The volunteer seedlings should be weeded out.

PRUNING REQUIREMENTS: Renewal pruning and pruning to restore shape is important.

***
NAME: Malus, Apples or Crabapples

HABIT: Small Trees

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Fertilizing lawns or beds beneath should suffice.

EXPOSURE: Full sun.

FLOWERING PERIOD: Early to mid-May.

GENERAL CULTURE: Very easy to grow with reasonable moisture.

SPECIAL PRUNING REQUIREMENTS: Prune apples in the late winter and Crabapples right after flowering. With apples, make sure to leave fruiting spurs (see text and illustration). Also, open up centers of trees for good aeration, and remove sucker shoots (these are long, straight shoots, often called "water sprouts" as well.

INSECTS:
- Aphids. Sucking insects on the leaves (no need to control unless severe damage is done).
- Scale. These coated insects appear on the twigs. Dormant oils are good for controlling these before the tree leaf out.
- Periodical Cicadas. These insects make deep, long slits in the bark and wood of the twigs. Prune out.

DISEASES:
- Fireblight. Ends of twigs die-back. Prune out and burn.
- Cedar apple rust. Rust spots on the leaves. Should not be a problem since there are not too many Cedars (the alternate host) in the area.
- Apple Scab. Scab marks on the flesh of apple fruit. No need to spray since a commercial crop is not desired.

** * * * **

NAME: Magnolia acuminata, Cucumbertree Magnolia

HABIT: Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Feeding lawns or beds beneath will suffice.

EXPOSURE: Full sun to partial shade.

FLOWERING PERIOD: Late May, early June.

GENERAL CULTURE: Does not tolerate extremes, drought or excessive moisture, well. Difficult to transplant because of fleshy rather than fibrous roots. If planting new ones, purchase balled and burlapped or container plants.
PRUNING REQUIREMENTS: Prune after flowering only to maintain balance of growth and to remove rubbing and touching or damaged wood.

MOST COMMON PESTS:
- **Leaf Blight.** Infects the leaves eventually killing them.
- **Magnolia Scale.** Brown, varnish-like hemispherical scale, 1/2" in dia. Underdeveloped leaves occur as a result of the scales which appear in August and over winter.

**NAME:** Menispermum canadense, Moovine  
**HABIT:** Vine  
**SOIL pH:** 6.5.  
**FERTILIZER REQUIRED:** Regular feeding as described in text.  
**EXPOSURE:** Sun, partial shade.  
**FLOWERING PERIOD:** May.  
**GENERAL CULTURE:** Very adaptable. Requires support on which to grow.  
**PRUNING REQUIREMENTS:** Renewal and to keep in bounds.

**NAME:** Parthenocissus quinquefolia, Woodbine  
**HABIT:** Tree  
**SOIL pH:** 5.5-6.5.  
**FERTILIZER REQUIRED:** Regular feeding as described in text.  
**EXPOSURE:** Sun, partial shade.  
**FLOWERING PERIOD:** May, berries in fall.  
**GENERAL CULTURE:** Needs support. A rich, well-drained soil is best, though the plant is adaptable.  
**PRUNING REQUIREMENTS:** Prune to keep in shape and within bounds.

**NAME:** Phellodendron amurense, Amur Corktree  
**HABIT:** Tree  
**SOIL pH:** Tolerates wide range.  
**FERTILIZER REQUIRED:** Fertilizing lawn or beds beneath should be sufficient.  
**EXPOSURE:** Full sun.
FLOWERING PERIOD: Late May or early June.

GENERAL CULTURE: Not demanding, very easy.

SPECIAL PRUNING REQUIREMENTS: Pruning to rid of damaged or rubbing branches. Tree naturally maintains a good shape. Pruning should be done in winter.

* * *

NAME: Philadelphus coronarius, Mockorange HABIT: Deciduous Shrub

SOIL pH: 6.5, but tolerates broad range.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Late May, early June.

GENERAL CULTURE: Requires a well drained, though rich soil, though it will tolerate varied conditions except very moist. Summer mulching is useful.

PRUNING REQUIREMENTS: Renewal pruning is required.

* * *

NAME: Pieris floribunda, Mountain Pieris or Andromeda HABIT: Evergreen Shrub

SOIL pH: 6.0.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: March-April.

GENERAL CULTURE: Must have moist soil. Summer mulching of leafmold is helpful. It is important to keep soil on the acid side by monitoring with soil tests and following results. Unless nearby shrubs or areas are limed, the natural acidity of the soil should be fine. If in very windy spot, the plants should be protected with burlap, snowfencing or boughs.

PRUNING REQUIREMENTS: Prune after flowering to keep shape of plant or to remove damaged parts.
MOST COMMON PESTS:

Leaf Spots. During rainy season.
Dieback. Fungus enters roots from the soil causing root decay and eventually death of entire plant.
Lace Bug. Sucking insect causes leaves to be mottled gray or yellow.
Two-Spotted Mite. Sucking pest also causes leaves to turn yellow.

* * *

NAME: Pinus strobus, White Pine
HABIT: Evergreen Tree

SOIL pH: 4.5-6.5.

FERTILIZER REQUIRED: Feeding lawn or beds beneath will suffice.

EXPOSURE: Sun.

GENERAL CULTURE: A well-drained sandy soil is best for this tree. It will not tolerate wet soil.

PRUNING REQUIREMENTS: Prune to remove damaged parts.

MOST COMMON PESTS:

White Pine Blister Rust. Rust attacks the living bark and cambium first breaking out in blisters which exude a sweetish secretion, later forming larger, bright orange-colored pustules.
Pine Bark Aphid. Insects work on the undersides of limbs and on trunk from ground up. Recognized by white, cottony material that collects in patches.
Pine Needle Scale. Needles appear nearly white with this elongated insect 1/10" long, white with a yellow spot at one end.
Pine Shoot Moth. A moth of which the larval stage destroys growing shoots.

* * *

NAME: Populus deltoides, Eastern Poplar or Cottonwood
HABIT: Tree

SOIL pH: Tolerates a wide range from acid to neutral.

FERTILIZER REQUIRED: Fertilization of lawn or bed beneath is sufficient.

EXPOSURE: Sun.

FLOWERING PERIOD: Late March through April depending upon season.

GENERAL CULTURE: While its native habitat is along stream beds, it will tolerate almost any situation. Has no specific cultural requirements excepting that it seeds itself profusely so the seedling should be pulled and destroyed.

PRUNING REQUIREMENTS: Damaged wood or branches that do not conform to desired shape should be removed.
DISEASES:

**Leaf Spots.** Brown spots appear on the foliage with darker brown leaf margins and early defoliation. Destroy fallen leaves.

***

NAME: **Prunus avium, Sweet Cherry**

HABIT: Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: May.

GENERAL CULTURE: Requires a rich and well-drained soil.

PRUNING REQUIREMENTS: Pruning to restore shape and to remove damaged, rubbing or touching wood, and sucker growth is essential.

DISEASES:

**Black Knot.** Black, rough cylindrical shaped galls develop on twigs.

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NAME: **Prunus virginiana, Chokeberry**

HABIT: Tree

SOIL pH: Wide range.

FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: No special requirements. Birds carry seed so seedlings grow throughout property and must be pulled up.

PRUNING REQUIREMENTS: Remove damaged, diseased, rubbing and touching wood. Prune to keep balance of form.

MOST COMMON PESTS:

**Leaf Curl.** Leaves appear much thickened and individual leaves are puffed and folded with edges curled inward. Affected leaves acquire red or purplish tints.

**Tent Caterpillar.** Web-like tents made in crotches of limbs. Prune out and burn.

***
NAME: Pyracantha coccinea, Scar et Firethorn  HABIT: Deciduous Shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun, partial shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: A well drained soil is essential. Summer mulching is useful. If winter winds are severe the shrubs should be protected with burlap or evergreen bows.

PRUNING REQUIREMENTS: The plant has no set form. Pruning should be used to keep it in bounds. Renewal pruning is useful.

INSECTS: Many insects infest Firethorn: aphids, lace bugs, several scales.

DISEASES:

Bacterial Fire Blight. New shoots wilt suddenly in late spring, turn black or brown, and die.

NAME: Pyrus communis, Common Pear  HABIT: Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Full sun.

FLOWERING PERIOD: Early to mid-May.

GENERAL CULTURE: No special care except to pick up fruit as it is ripe or drops from the tree in an attempt to prevent spread of disease or attracting insects.

PRUNING REQUIREMENTS: Remove rubbing and touching wood, suckers. Take care not to remove fruiting spurs as in Apples. Prune in late winter.

MOST COMMON PESTS:

Fire Blight. Kills twigs, foliage, and fruit. Wood of infected twigs is black and bark is darker than normal. Edge of infected area of bark is slightly sunken and very sharply defined. Prune and burn.

Fall Webworm. White webs or nests are formed on the ends of branches.

Pear Psylla. Sap is excreted and drips on lower leaves and in it a sooty fungus grows.

San Jose Scale. Small circular dark gray scale infests the bark. Prune yearly in February leaving flowering spurs.

** * **
NAME: **Quercus rubra**, Red Oak  
HABIT: Tree

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Fertilizing lawn or shrub beds beneath is sufficient.

EXPOSURE: Sun.

GENERAL CULTURE: A well-drained soil is best. If soil is not kept acid, the tree will develop a chlorotic condition. Periodic soil testing is important.

PRUNING REQUIREMENTS: Prune to keep shape and to remove damaged or severely rubbing branches.

* * *

NAME: **Rhamnus cathartica**, Common Buckthorn  
HABIT: Deciduous Shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Sun, partial light shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: Very adaptable. No special requirements. Birds carry fruit and seedlings come up over the grounds and must be weeded out.

PRUNING REQUIREMENTS: Renewal.

INSECTS:  
**Aphids**. Leaf-sucking. Usually do not cause severe damage.

* * *

NAME: **Rhamnus frangula**, Glossy Buckthorn  
HABIT: Deciduous Shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun or partial shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: Tolerates a wide range of conditions except excessive soil compaction. Prefers well-drained soil.
PRUNING REQUIREMENTS: Renewal.

INSECTS: 
Aphids sometimes attack new growth.

* * *

NAME: Rhododendron catawbiense, Catawba Rhododendron
R. calendulaceum, Flame Azalea
R. x gandavense, Ghent Azalea
R. obtusum, Hiryu Azalea
R. yedoense poukhanense, Korean Azalea
R. vaseyi, Pinkshell Azalea
R. maximum, Rosebay Rhododendron
R. Kaemferi, Torch Azalea

SOIL pH: 5.5-6.0.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Light sun to partial shade.

FLOWERING PERIOD: May, June.

GENERAL CULTURE: Rhododendrons, like most members of the ericaeaceous family, require a humusey, moist, but well-drained soil. A summer mulch is essential to keep the soil moist and cool. These species will not withstand drought conditions without causing a great deal of die-back on the plants. The two evergreens (Catawba and Rosebay) will require protection from strong winds in winter, and all of the species should into the winter with a very moist soil. As the flowers fade it is important to dead-head them, especially with the two evergreen species.

SPECIAL PRUNING REQUIREMENTS: Prune to keep shape or to remove damaged parts. Renewal pruning does not apply with these plants.

MOST COMMON PESTS: 
Leaf Spots. Fungi cause brown spots on leaves. 
Shoot Blight. Leaves and young shoots are attacked when the plants are in full bloom early in June. 
Rhododendron Tip Midge. Newly developing leaves are rolled and their edges browned by small white maggots. New growth is stunted. 
Mites. Four species infest the Rhododendron. 
Mealybugs. Three species attack Rhododendron. 
Rhododendron Whitefly. Yellowish mottling on the upper sides of leaves. Honeydew is secreted and causes black sooty mold.

* * *
NAME: **Rohinia pseudo-acacia**, Black or Common Locust  
HABIT: Tree

SOIL pH: Wide range.

FERTILIZER REQUIRED: Fertilizing adjoining lawn or shrub bed is enough.

EXPOSURE: Full sun.

FLOWERING PERIOD: Late May - early June.

GENERAL CULTURE: Tolerant of a wide range of conditions except over-moist soil. Tree is prone to send up suckers. Remove these by pulling them when they occur.

PRUNING REQUIREMENTS: Remove damaged wood, keep a balance of form.

INSECTS:
- Borer. Remove damaged wood.
- Leaf miner. Larvae enter leaf and make irregular mines giving a netted appearance to the green tissue. Ignore unless condition becomes severe.

**NAME:** **Rosa species**, Roses  
HABIT: Deciduous Shrubs

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun.

FLOWERING PERIOD: June and throughout growing season for some species.

GENERAL CULTURE: Roses require a very rich soil, high in humus and in fertility. The soil should and must be kept constantly moist and well drained for proper growth and flowering. Summer mulches, as described in text, are useful in keeping the soil moist and as a means of keeping weeds down, and adding organic matter to the soil. Throughout the growing season it is important to pick up any fallen leaves that may be diseased or harbor diseases. If continuous flowering is desired, dead-heading is important. Winter mulches are essential for keeping the soil temperature constant and thus preventing winter killing.

PRUNING REQUIREMENTS: With climbing roses, remove 1/4 to 1.3 of the canes each year. The remaining canes should be trained to a support. Shrub roses should be cut back to within six to nine inches of the ground, cutting back to strong lateral buds. As the new shoots come forth, they should be carefully pruned to produce the desired shape.
INSECTS:

**Japanese Beetles, Rose Chafers.** These feed on the leaves leaving unattractive holes. Handpicking is useful.

DISEASES:

**Black Spot.** Dark color and fringed borders distinguishes this from other types of spots. Occur on either side of leaf.

**Botrytis Blight.** Prevents blooms from opening. Buds turn brown and decay. Sometimes partially opened flowers are attacked, the individual petals turning brown and shriveling.

**Powdery Mildew.** Tendency of young leaves to curl exposing lower surface. Leaves are dwarfed and deformed. Ends of canes are killed.

**Common Stem Canker.** Black pycnidial spots. Develops at point where canes have been cut back in pruning. Young cankers are pale yellowish becoming brown, sunken and cracked with age.

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**NAME:** Rubus allegheniensis, Blackberry  
**HABIT:** Deciduous Shrub

**SOIL pH:** Tolerates a wide range.

**FERTILIZER REQUIRED:** Complete once a year in spring if fruit is desired. Otherwise, none is necessary.

**EXPOSURE:** Sun.

**FLOWERING PERIOD:** Mid-spring with fruits in late July.

**GENERAL CULTURE:** Very easy to grow. Problem is that they may grow rampantly and have to be pulled up when they out-grow their bounds. For shrubbier growth, cut back tips so that canes three feet high remain.

**PRUNING REQUIREMENTS:** Cut back one third of the old canes (to the ground) each year.

**DISEASES:**


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**NAME:** Rubus idaeus, Raspberry  
**HABIT:** Deciduous Perennial

**SOIL pH:** 6.5.

**FERTILIZER REQUIRED:** Regular feeding as described in text.

**EXPOSURE:** Sun.

**FLOWERING PERIOD:** May.
GENERAL CULTURE: Keep free of weeds especially the vine type Bineweed and Dodder that tend to invade plants. Plants respond well to shallow cultivating and then a mulch of compost (best not to be applied during the summer. This should be applied described under summer mulches in text.

SPECIAL PRUNING REQUIREMENTS: Each early spring cut back to right to the ground. The older canes are fatter and greyer than the new Young canes are a russet brown color. Young canes should be pruned back so that the remaining canes are at least 3 feet high. This should also be done early spring.

DISEASES:
Mosaic. Infection delays leaf development, and the cane becomes stunted and rosetted. Leaves exhibit chlorotic mottling.

* * *

NAME: Sambucus canadensis, Elderberry, HABIT: Deciduous, American Elder

SOIL pH: 5.5-6.5.

FERTILIZER REQUIRED: 3-4 lbs. 5-10-10 or similar complete fertilizer in the spring.

EXPOSURE: Full sun to partial shade.

FLOWERING PERIOD: Late spring.

GENERAL CULTURE: Prefers a moist soil but will grow even in dry conditions though fruiting will not be as abundant if over-fertilize. Summer mulching useful to retain moisture even.

PRUNING REQUIREMENTS: Renewal.

INSECTS:
None.

DISEASES:
Mildew on berries. No need to spray.

* * *

NAME: Syringa x chinensis "Alba," White Chinese Lilac, Syringa x prestoniae, "Isabelle," Preston Hybrid Lilac, Syringa vulgaris, Common Lilac
SOIL pH: 6.5-7.0.

FERTILIZER REQUIRED: Regular feedings as described in text.

EXPOSURE: Full sun.

FLOWERING PERIOD: May, June.

GENERAL CULTURE: Test soil on regular basis as described in text and be sure to maintain it at the recommended pH level for good flowering. Make sure to dead-head these shrubs when the flowers go by. On S. vulgaris remove excessive sucker growth.

PRUNING REQUIREMENTS: Renewal as described in text.

MOST COMMON PESTS:

Phytophthora Blight. Dark brown lesions on shoots which often kills them to the ground. Root sprouts that have come up under the bush often have leaves blackened and are extensively killed.

Powdery Mildew. Leaves are covered with a whitish, felt-like patch of mycelium.

Wilt. Leaves lose their glossiness and appear pale and wilted; they fall prematurely, leaving branches bare during end of summer.

Lilac Borer. Infested branches often wilt because of the destruction of sapwood. Branches are so weakened, they break.

Scales. Seven species infest Lilac, most commonly the Chinese Lilac.

NAME: Spirea thunbergii, Spirea HABIT: Deciduous Shrub
Spirea x Vanhouttei, Bridalwreath

SOIL pH: 6.0-7.0.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun.

FLOWERING PERIOD: May.

GENERAL CULTURE: Requires a well-drained soil. Extremes, either high drought or excessive moisture, are not desirable.

PRUNING REQUIREMENTS: Renewal pruning is essential for best growth and flowering.

NAME: Sorbus aucuparia, European Mountain Ash HABIT: Tree

SOIL pH: 5.5-6.0.
FERTILIZER REQUIRED: Feeding lawn or bed beneath is sufficient.

EXPOSURE: Sun.

FLOWERING PERIOD: Late May.

GENERAL CULTURE: Requires well drained soil.

PRUNING REQUIREMENTS: Remove damaged woods. Prune to retain desired form.

MOST COMMON PESTS:
- **Fire Blight.** A very serious disease on Mountain Ash.
- **Leaf Rusts.** On leaves circular, light yellow, thickened spots first appear during the summer. Later, orange cups develop on the lower surface of these spots.
- **Mountain Ash Sawfly.** Green larvae with black dots feed on leaves from early June to mid-July leaving only the larger veins and midribs. Adults, yellow with black spots, deposit eggs on leaves in late May.
- **Scales.** Five species infest this host.

NAME: *Symphoricarpus x Chanaulti*, Chanault Coralberry

HABIT: Deciduous Shrub

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding, see text.

EXPOSURE: Sun, partial shade.

FRUITING PERIOD: Autumn.

GENERAL CULTURE: No special requirement. Moderate soil moisture and partial shade are useful. Spreads rapidly by underground suckers some of which may have to be removed with it grows out-of-bounds.

PRUNING REQUIREMENTS: Renewal.

DISEASES:
- **Anthracnose.** Cinnamon-colored spots on fruit. Infected berries become black, rough, and mummified before they drop off prematurely.
- **Berry Rot.** Berries turn yellowish or brown and are affected by a soft, watery rot. Bud scales and bark also become infected.
- **Powdery mildew,** which disfigures leaves and fruit.

* * *
NAME: Taxus cuspidata "nana," Dwarf Japanese Yew  
HABIT: Evergreen Shrubs
Taxus baccata "Repandans," English Weeping Yew
T. canadensis, American Yew
T. x media "Hatfieldi," Hatfield Yew
T. cuspidata "nana CapiCaCa," Pyramid Dwarf Japanese Yew

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun to partial shade.

GENERAL CULTURE: Rich, moist, well-drained soil. When planting new ones, do not plant them deeper than they grew in nursery or they will die. Heavy snow should be brushed off as soon as it falls so as to prevent breakage.

PRUNING REQUIREMENTS: As described for evergreens in text.

INSECTS:
Black Vine Weevil. Leaves turn yellow and whole branches or even entire plant may die when the roots are chewed by the larval stage, a white-bodied, brown-headed pest, 3/8" long. The adult, a snout beetle, feeds on the foliage at night. Edges of leaves are scalloped.
Taxus Mealybug. 3/8" long bug covered with white wax, may completely cover trunk and branches of Yews.

* * *

NAME: Tilia americana, American Linden  
HABIT: Tree

SOIL pH: 6.5-6.9, but will tolerate a wide range.

FERTILIZER REQUIRED: Lawn or garden fertilization is sufficient unless tree appears to yellow in which a soil sample should be taken and its recommendations followed.

EXPOSURE: Sun or partial shade.

FLOWERING PERIOD: Late spring.

GENERAL CULTURE: Keep well pruned of severely rubbing and touching or damaged branches. Prefers moist soil but will tolerate a wide range of soil moisture.

INSECTS:
Linden aphid which sucks from the leaves and exudes a sticky substance. Not necessary to spray.

* * *
NAME: Tsuga canadensis, Canadian Hemlock
       Tsuga Caroliniana, Carolina Hemlock

HABIT: Evergreen Tree

SOIL pH: 5.5-6.5.

FERTILIZER REQUIRED: Complete fertilizer in spring.

EXPOSURE: Sun (if enough moisture provided) and shade.

FLOWERING PERIOD:

GENERAL CULTURE: Does not tolerate heavy wet soil. Moist well-drained soil is desirable. Shallow-rooted so will not take soil compaction. When soil compaction occurs, needles will slowly yellow, then drop.

PRUNING REQUIREMENTS: Clip back terminal tips to get compact form (see text and illustration).

INSECTS:

Mites. Almost microscopic sucking insects. Ignore unless severe for then needle drop will occur on the lower branches.

***

NAME: Viburnum dentatum, Arrowwood
       V. plicatum var. tomentosum, Doublefile Viburnum
       V. dilatatum, Lindenleaf Viburnum
       V. lantageo, Nannyberry
       V. setigerum, Tea Viburnum

HABIT: Deciduous Shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: May

GENERAL CULTURE: Required rich, well drained soil though not fussy. Do not dead-head because Viburnums are noted for their attractive fruit in the late summer and fall. A summer mulch is helpful in conserving moisture. Birds carry seeds and seedlings grow up throughout the site. These must be weeded out.

PRUNING REQUIREMENTS: Renewal as described in text.

INSECTS:

Viburnum Aphid. Insects cluster together in great numbers at tips of branches, causing leaves to curl over and become deformed.
DISEASES:
Powdery Mildew. Leaves become completely covered with this mildew late in summer when bushes are in shaded places.

* * *

NAME: Vitis labrusca, Fox Grape  
Vitis vinifera, Wine Grape  
HABIT: Vines

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: May.

GENERAL CULTURE: Provide a trellis support for all grapes, or some type of support on which they may grow.

SPECIAL PRUNING REQUIREMENTS: Prune as described in text in winter before sap starts to flow (see schedule of weekly activities). Trim off long sucker shoots during the growing season.

DISEASES:
Downy Mildew. Appears as a white mold-like growth on the fruit, leaves, and young stems. Recognized by the reddish areas on upper side of leaf. Infected fruit may develop light brown rot or maintain a nearly normal appearance but fail to ripen.
Powdery Mildew. Appears as a white mealy growth on upper surfaces of foliage, reaching its peak in late summer.

* * *

NAME: Ulmus americana, American Elm  
HABIT: Tree

SOIL pH: 6.5-6.9.

FERTILIZER REQUIRED: According to soil test recommendations. Normally, fertilization of the lawn will also benefit the tree, but if a soil test indicates that the tree is in need of additional nutrients, then 1/3 cup of fertilizer should be placed in holes made with a bar 6 inches deep. These holes should be made 18 inches apart in three rings 18 inches apart starting under the drip line of the tree and working towards the center. 10-10-10 is a good fertilizer grade to use.

EXPOSURE: Full sun.

FLOWERING PERIOD: Mid spring.
CENERAL CULTURE AND PEST CONTROL: The following excerpts were taken from a report by Dr. James Sherald, Ecological Services Laboratory WASO, dated 6 June 1984:

INSERT - see attached.

PRUNING REQUIREMENTS: See above.

* * *

Olmsted Elm

Dutch elm disease (DED) symptoms usually begin to appear toward the end of the first week in June.

Recommendations

1. **Thoroughly examine the tree weekly** throughout the growing season for DED symptoms. Since the elm is so tall, binoculars should be used.

2. Twig samples, 6" long x 0.5" diameter, consisting of live tissue should be collected from chlorotic and/or wilted branches for culture confirmation of the DED pathogen. If scattered chlorosis appears again in 1984; samples should be collected from all limbs, labeled according to the branch from which they were taken and submitted for analysis.

3. If DED is confirmed in two or more disjunct limbs, the infection is likely systemic and treatment will not be effective since systemic infections cannot be cured. Systemic infections in older, weakened trees sometimes occur as chronic infections killing the tree slowly over several years rather than in the characteristic acute fashion most commonly observed.

If the disease is localized in a single limb, fungicide therapy and surgical removal of the limb should be performed immediately. If possible the fungicide (Arbotect) injection should be made before the infected limb is removed since there may be a backflush of the pathogen into noninfected wood when the pruning cut is made. If fungicide cannot be injected immediately, then the limb should be removed as soon as possible. The limb should be pruned as far back as possible, preferably removing ten feet of sapwood clear of fungal discoloration.

4. All dead and weakened wood should be removed. The weakened portions of the tree can serve as breeding sites for the European elm bark beetle Scolytus multistriatus, the DED vector.

5. Since beetles are attracted to pruning cuts, all pruning and dead wood removal other than removal of hazardous limbs, should occur when beetles are inactive, October-March.

6. Unless sanitation is particularly poor in the immediate community, methoxychlor treatment for the elm bark beetle will not be necessary.
7. Since the tree appears weak, attention should be given to fertilization and irrigation.

8. Cabling should be examined regularly and additional cables installed, particularly on limbs near the house. However, no investment in cabling, pruning, or fertilization should be made until the tree can be declared free of DED.

9. Considering the age of the Olmsted Elm, its general lack of vigor and vulnerability to DED, plans should be made for its inevitable replacement. Considering the significance of the Olmsted Elm as the focal point in the landscape, it should be replaced with an American elm.

Since American elms are difficult to find commercially, the staff should consider growing several potential replacements on the site.

The Elm Research Institute (ERI) is offering the DED resistant American elm cultivar "Liberty." I have discussed the tree with its founder, Dr. Eugene Smalley, Plant Pathologist, University of Wisconsin. Dr. Smalley has provided six cultivars to ERI all of which are being distributed under the name "Liberty." The selections are a result of over 20 years of selection and testing. Dr. Smalley indicated that selection M-8 is the most resistant cultivar being distributed by the Institute. If a resistant selection is used, it must be understood that it is only resistant and not immune and that infection can occur under certain circumstances.
II - LONGFELLOW NATIONAL HISTORIC SITE, CAMBRIDGE, MASSACHUSETTS

NAME: Acer, Maples

(See under Olmsted Historic Site, Section C-I)

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NAME: Aesculus hippocastanum, Horse-Chestnut

(See under Olmsted Historic Site, Section C-I)

* * *

NAME: Althaea rosea, Hollyhock

HABIT: Perennial

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: June through July.

GENERAL CULTURE: See Digitalis pupurea (Foxglove).

PESTS:

Japanese Beetle. Hollyhocks are the plants most often attacked during the blooming season.

Hollyhock Leaf-Skeletonizer. Tan and gray moth completely skeletonizes leaves.

Two-Spotted Mite. This parasite is most serious pest of hollyhock, often causing the leaves to become spotted, dried out, and unsightly.

Rust. Small brown spots about the size of a pinhead develop on the undersides of leaves and are seen on the upper sides as larger, bright yellow or orange spots with reddish centers.

* * *

NAME: Antirrhinum majus, Snapdragons

HABIT: Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURES: Sun, partial shade.

FLOWERING PERIOD: Late June throughout the summer and early autumn.

GENERAL CULTURE: Same as for Petunia, excepting that Snapdragons may require staking as they grow upright.
MOST COMMON PESTS:

INSECTS:

Aphids. Feed on upper sides of leaves and on tender tip ends.
Caterpillars. Yellow woolly-bear and stalk borer are troublesome.
Two-Spotted Mite. In dry seasons, this pest is abundant.
Red and Black Stink Bug. 1/4" long attacks plants.

NAME: Athyrium filix-femina, Lady Fern
(See Osmunda, this section)

NAME: Berberis thunbergii, Japanese Barberry
(See under Olmsted Historic Site, Section C-I)

NAME: Buxus sempervirens, English Boxwood
HABIT: Evergreen Shrub
SOIL: 6.5.
FERTILIZER REQUIRED: Regular feeding as described in text.
EXPOSURE: Sun, partial shade.
GENERAL CULTURE: Requires a rich, well-drained soil. The soil must be moist. This plant will not stand extremes in soil moisture. It is surface rooted so cultivation within its root zone must be very shallow. A summer mulch to protect the roots and to keep them cool is ideal.

SPECIAL PRUNING REQUIREMENTS: At the Longfellow Historic Site this plant is used as an edging plant. It should be pruned as a low hedge, its ultimate height to be 1 foot maximum and no more than that in width. It should be sheared slightly wider at the base than at the top in order to encourage full growth to the ground.

PESTS:

Boxwood Psyllid. Terminal leaves are cupped and young twig growth is checked by this small, gray, sucking insect covered with a cottony or white, waxy material.
Boxwood Leaf Miner. Oval, water-soaked swellings on the lower leaf surface.
Boxwood Webworm. Chews leaves and forms webs.
Nematodes. Leaf-bronzing, stunted growth, and general decline.
Boxwood Mite. Light mottling followed by brownish discoloration of the leaves.
NAME: Campanula media, Canterbury Bells  HABIT: Biennial

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: June, July, August.

GENERAL CULTURE: Requires a rich garden loam. Plants will need staking (see text). It is important to dead-head the older flowers so that the newer ones will receive all of the plant nutrients. Because the plant is biennial it is good to purchase second year plants in the early spring so that the garden will have them in bloom each season. If one-year plants are installed they will not bloom that first year.

INSECTS:
    Onion Thrips. Sucking pest.
    Slugs. Chew leaves during night.
    Since these are biennials, plan to replace them every two years.

***

NAME: Catalpa speciosa, Catalpa  HABIT: Tree

SOIL pH: 6.5 ideal but tolerates wider range.

FERTILIZER REQUIRED: If lawn beneath is fertilized no additional is needed.

EXPOSURE: Sun.

FLOWERING PERIOD: June.

GENERAL CULTURE: Very easy to grow. Long fruiting pods must be raked up as the tree seeds easily and young Catalpas will volunteer. The large leaves should not be allowed to sit on the lawn beneath when they fall, especially during wet seasons, because they form a shingling effect which excludes soil aeration to the lawn below.

PRUNING REQUIREMENTS: Prune to maintain shape and to remove damaged wood.

INSECTS:
    Comstock Mealybug. Distorted growth of twigs, limbs, and trunk may be produced by the sucking of this small, elliptical, waxy-covered insect. Leaves may be covered with black sooty mold from this pest.
    Catalpa Midge. Leaves are distorted, and circular areas inside the leaves are chewed, leaving a papery epidermis.

***
NAME: Cedrus libani, Cedar of Lebanon  HABIT: Evergreen Tree

SOIL pH: 6.5.

FERTILIZER REQUIRED: Fertilizing lawn or beds beneath will suffice.

EXPOSURE: Full sun is essential.

GENERAL CULTURE: Requires a rich, moist, well-drained soil. The tree must not be shaded or crowded for optimum growth.

PRUNING REQUIREMENTS: Prune to restore shape and to remove any damaged parts.

INSECTS:

Black Scale. Secretes on the leaves and stems a substance on which the sooty mold fungus grow.

Deodar Weevil. Leaders and terminal twigs turn brown and die. Small trees may be killed by this pest.

NAME: Clematis hybrids, Clematis  HABIT: Vine

SOIL pH: 6.5-7.0.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Mid-May through June.

GENERAL CULTURE: Requires a rich, well-drained soil. The roots must be kept cool in summer with deep summer mulching of compost. The vines need trellis support and while they will usually climb a trellis without additional tying, it may be necessary in some instances to do so.

PRUNING REQUIREMENTS: In the late winter, prune back the lighter, outer wood to the sturdier wood towards the center of the plant. This wood will usually be a reddish-brown color.

PESTS:

Black Blister Beetle. Flowers and leaves devoured.

Clematis Borer. Fleshy roots and crown attached by 2/3" long, dull white larva. Adult is clear-winged. Infested vines are stunted and lack vigor.

Whiteflies. Small white flying insects.

Mites. Tiny sucking insect, causes stunted growth, stippled leaves.

Scales. Soft bodied, brownish, scaly covering.
Leaf Spot and Stem Rot. Small water-soaked spots, buff-colored with red margins, develop on leaves. Fungus extends into stems, girdling them and causing the upper parts to die.

* * *

NAME: Convallaria majalis, Lily-of-the-Valley HABIT: Perennial

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Light sun, partial shade.

FLOWERING PERIOD: Late May, early June.

GENERAL CULTURE: Requires a rich, well-drained soil. Given these conditions the plant is not fussy and should thrive well. Summer mulching is useful in keeping weeds down if the planting is not thick.

* * *

NAME: Crataegus, Hawthorn

(See under Olmsted Historic Site, Section C-I)

* * *

NAME: Dahlia hybrids, Dahlia HABIT: Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Full sun.

FLOWERING PERIOD: July through the summer.

GENERAL CULTURE: A rich, well-drained soil is required. The tubers will be planted out each year into holes dug twice as large as the tubers and twice as deep. The final level of the tuber should be so that the stems are an inch below the finished soil surface. The plants will require staking (see text). If the tubers are to be held over they should be dug after the first killing frost. The tops should be cut back to six inches of the top of the tuber. They should be stored in soil over winter in a place where the temperature will not drop below 50 degrees F. The soil must be kept moist. Placing the container in which they are stored into a large, closed plastic bag is helpful in maintaining the soil moisture throughout the
winter. The bags should be opened and the tubers checked every few weeks to make sure that soil moisture is being maintained.

INSECTS:

**European Corn Borer.** First flesh-colored, later smoky and reddish along the back. They feed on tender bud ends, flower parts and leaves, causing them to become distorted and turn brown. Tips die completely.

**Leafhopper.** Discoloration of the leaf, which appears first along one margin and spreads toward the mid-vein. Plants become stunted.

**Thrips.** Under surfaces of petals turn whitish and wither.

***

**NAME:** Delphinium ajacis, Larkspur  
**HABIT:** Biennial

**SOIL pH:** 6.5.

**FERTILIZER REQUIRED:** Regular feeding as described in text.

**EXPOSURE:** Sun.

**FLOWERING PERIOD:** Late May through summer.

**GENERAL CULTURE:** Requires a well-drained, rich, moderately moist soil. Staking is necessary as the plants come into flower. Dead-heading gone-by spikes is useful in keeping new shoots coming into flower. As with other biennials, they should be replaced after flowering with new plants ready to bloom.

**MOST COMMON PESTS:**

**INSECTS:**

**Aphids.** Three species cause the leaves to cup downward.

**Borers.** Infested stalks are weakened, wilt, and fall over.

**Larkspur Leaf Miner.** Large areas of leaf-blades become discolored and collapsed as though blighted. They pupate outside the leaves near a mine in brown seedlike cases which are attached to the leaf.

***

**NAME:** Dianthus carophyllus, Carnation  
**HABIT:** Annual and Perennial

**Dianthus species,** Pinks

**SOIL pH:** 6.5.

**FERTILIZER REQUIRED:** Regular feeding as described in text.

**EXPOSURE:** Full sun.

**FLOWERING PERIOD:** Late May through summer.
GENERAL CULTURE: Dianthus require a rich, moist, well-drained garden loam. The Pinks will not need staking but the Carnations will need support. Small forked branches of wild cherry or similar material make excellent supports and are authentic.

INSECTS:
Variegated Cutworm. Eggs laid on stems or under leaves. Caterpillar is 2" long. Feeds on buds, often cutting stem just below. June and July.
Two-Spotted Mite. Leaves turn pale and have a dusty coating and fine webs, and the plant is stunted when heavily infested.

** **

NAME: Digitalis atropupurea, Foxglove HABIT: Biennial

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Late June through July, sometimes second bloom.

GENERAL CULTURE: Same as for Campanula, Canterbury Bells, except that sometimes the plants will live longer than two years. However, on an historic site it is important to replace them with second year plants in order to be assured of bloom each season.

Good dead-heading will often yield a second flush of bloom.

PESTS:
Aphids. Sucking insects.
Beetles. Feed on leaves and flowers.
Mealybug. Beetles that chew on leaves.
Stem and Bulb Nema. Development of angular leaf spots.
Rust. Disease causes rusting of leaves.
Replace plants every two years. Tall plants may need staking.

** **

NAME: Gleditsia tricanthos, Honer Locust

(See under Olmsted Historic Site, Section C-I)

** **

NAME: Helianthus tuberosa, Sunflower HABIT: Perennial

SOIL pH: 6.0-6.5.
FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Mid-summer.

GENERAL CULTURE: Not particular as to soil but a rich garden loam is preferred. The clumps or planting of Sunflower may need to be staked when they come into bloom. When the plantings get established they may have to be kept in bounds by digging out undesired plants.

***

NAME: Heliotropum arborescens, Heliotrope HABIT: Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Mid-May through summer.

GENERAL CULTURE: See Pelargonium (Geranium).

INSECTS:

Aphids. Soft-bodied sucking insects.
Mealy Bugs. Chewing, mealy-coated beetles.

***

NAME: Hosta species, Hosta HABIT: Perennial

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: Early summer.

GENERAL CULTURE: A rich, well-drained soil is best although the plant is tolerant of a wide range of conditions. In the fall when the hard frosts kill back the leaves it is important to remove and destroy them (not as compost) because they occasionally have leaf spots that should not be perpetuated. When the clumps get too large or push themselves out of the ground they should be divided into clumps six inches in diameter and reset.

***
NAME:  Iris siberica, Siberian Iris  
HABIT:  Perennial

SOIL pH:  6.5.

FERTILIZER REQUIRED:  Regular feeding as described in text.

EXPOSURE:  Sun.

FLOWERING PERIOD:  Late May, early June.

GENERAL CULTURE:  Requires a good, rich, well-drained soil. An even moisture is also desirable. After a period of time the clumps will get large and work their way greatly above the soil surface. About every five years the clumps should be divided with each new clump being about eight inches in diameter. When the flowers go by remove the entire flowering stalk. These plants to not require staking.

INSECTS:

* * *

NAME:  Ligustrum, Privet

(See under Olmsted Historic Site, Section C-I)

* * *

NAME:  Lilium japonicum, Japanese White Lily  
HABIT:  Perennial

SOIL pH:  6.5.

FERTILIZER REQUIRED:  Regular feeding as described in text.

EXPOSURE:  Sun.

FLOWERING PERIOD:  July.

GENERAL CULTURE:  A well-drained soil is essential. Reset the bulbs in the early spring every three to four years. If the bulbs have declined in size or number, purchase replacements. The plants will require staking as they come into bud (see text).

PESTS:
Fuller Rose Beetle.  Grayish-brown weevil, with a short, broad snout and a white diagonal stripe across each wing-cover, feeds at night leaving ragged areas from the margins of the leaves.
Stalk Borer. One inch long larvae feed on lily stalks.
Bulb Mite. Feed around the basal plate of bulb and destroy roots. They burrow into stems. Leaves and stems developed from infested bulbs become yellow and the basal parts of the stem are corroded. Mosaic Virus. Masked infection or chlorotic mottling.

** **

** **

NAME: **Lonicera sempervirens**, Trumpet Honeysuckle HABIT: Vine

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding, spring treatment only.

EXPOSURE: Sun.

FLOWERING PERIOD: Late June through August.

GENERAL CULTURE: Well-drained, rich soil is best. Summer mulch is useful to keep soil evenly moist. The vine needs a trellis support.

SPECIAL PRUNING REQUIREMENTS: Prune to restore shape and to remove highly rampant parts that grow out-of-bounds.

INSECTS:

Woolly Honeysuckle Aphid. Yellow with black head and thorax causes leaf curling.
Leaf Rollers. Three kinds infest plant by feeding inside the rolled up leaves.
Four-Lined Plant Bug. Yellow-green with four black stirpes down wing covers, they usually feed on topmost leaves and cause an irregular bronze or brown spotting.
Planthopper. Young insects are enveloped within a cottony fungus-like mass. They are pale green with an upturned tail covered in hair. Trim regularly to keep in check.

** **

** **

NAME: **Lupinus polyphyllus**, Lupine HABIT: Perennial

(See Delphinium (Larkspur), the section)

** **

** **

NAME: **Malus** (Apple)

(See under Olmsted Historic Site, Section C-I)

** **
NAME: Osmunda cinnamonea, Cinnamon Fern  HABIT: Perennial

SOIL pH: 5.5-6.5.

FERTILIZER REQUIRED: Regular feeding but very lightly and only in spring.

EXPOSURE: Partial shade or shade.

GENERAL CULTURE: Requires a moist, rich soil. Culture is easy. Requires no staking. A summer mulch of leafmold is useful.

INSECTS:
- Nemas. Easily recognized by the reddish-brown or blackish bands which extend from the midribs to the borders.
- Fern Aphids. Small, pitch-black aphid with whitish legs and conspicuous, black, clouded areas in the wings.
- Thrips. Brownish appearance of the fronds.
- Scales. Reddish-brown and flat.

***

NAME: Paeonia officinalis, Peony  HABIT: Perennial

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Late May, early June.

GENERAL CULTURE: Require a rich, well-drained soil. New plants cannot be planted too deep. The place where the stem junct the root system cannot be deeper than one inch below the soil surface lest the plants will not flower. Staking is a must for peonies because the flower heads are heavy. Immediately after flowering the head should be cut back to the leaves so that the stubs do not show. Peonies respond well to summer mulches of compost. When the clumps get too large and work their way to high above the ground it is a good idea to divide the clumps. Each new clump should be about one foot in diameter for an historic site. Divisions should take place in early September, not the spring as with some other plants.

INSECTS:
- Ants. Crawl over buds.
- Rose Leaf Beetle. Small, shining-green to blue beetle infests the leaves and flowers.
- Scales. Three species attack in late summer.
Flower Thrips. Minute insects suck the juice from petals, causing brown spots on light-colored varieties and red spots on dark varieties. Botrytis Blight. Gray mold appears on young leaf bases in spring when shoots are 1' long. Leafy shoots wilt suddenly and fall over.

* * *

NAME: *Parthenocissus quinquefolia*, Virginia Creeper

(See under Olmsted Historic Site, Section C-I)

* * *

NAME: *Pelargonium zonale*, Geranium  
HABIT: Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Mid-May through summer and early autumn.

GENERAL CULTURE: Require a rich, well-drained soil. A moist soil is important. It is important to carefully remove gone-by blossoms and yellowing leaves as the plants grow in the garden. If the plants get too rampant and out-of-bounds, the rampant shoots should be broken off (not cut with shears). With Geraniums it is better for the soil to be slightly dry than too moist.

PESTS:

INSECTS:
- Caterpillars. Several kinds feed on the leaves.
- Mealybugs. Chewing beetles.
- Four-Lined Plant Bug. Dark, depressed spots on the leaves.
- Mites. Infested leaves are curled, distorted, or scorched.
- Sales. Cottony-cushion and lesser snow.

* * *

NAME: *Petunia hybrida*, Petunia  
HABIT: Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in the text.

EXPOSURE: Sun.

FLOWERING PERIOD: Early June throughout the summer and early autumn.
GENERAL CULTURE: Set seedlings out in a rich, well-drained, moderately moist soil, but do not set them too deep. When the plants start to grow, pinch out the center to encourage good laterals and bushy plants. As the plants flower, cut off the gone-by flowers or flowering shoots. Go over the bed and do this about every two weeks to encourage good flowering throughout the season. Also, as the plants get too leggy, cut back the stems to encourage a new flush of vegetative growth and subsequent flowering. In the fall, when the garden is cleaned, remove the plants from the garden. Do not compost them.

INSECTS:
Beetles. Several kinds feed on Petunias.
Fleahopper and tarnished plant bug attack leaves.
Caterpillar. Several kinds chew the leaves.
Trim off flower clayxes when flowers drop off to encourage flowering.
Prune back plants when they get leggy.

* * *

NAME: Philadelphus coronarius, Mockorange  HABIT: Deciduous Shrub
SOIL pH: 6.5.
FERTILIZER REQUIRED: Regular feeding as described in text.
EXPOSURE: Sun.
FLOWERING PERIOD: Late May, early June.
GENERAL CULTURE: The same as for Deutzia and Lilac (See under Olmsted Historic Site, Section C-I).

* * *

NAME: Phlox paniculata, Summer Phlox  HABIT: Perennial
SOIL pH: 6.5.
FERTILIZER REQUIRED: As described in text with no special requirements.
EXPOSURE: Full sun - will take half day of sun without plant decline.
FLOWERING PERIOD: Depends on cultivar. Summer blooming, mid-July through mid-August.
GENERAL CULTURE: As described in text for fertilizer, liming, and general soil preparation, as well as watering. Remove flower heads immediately after petal drop so that seeds will not form. This may also encourage a second flowering with early blooming cultivars. No need to stake unless the cultivar is unusually tall growing and in a windy spot.
About every three years, if clumps show signs of mounding at the crown and heaving themselves out of the soil, they must be divided and reset. In historic gardens, don't make the division as small as in a regular garden (no less than 3-4 inches in diameter). Winter mulching, as described in text is useful.

DISEASES:
- Mildew - to control: start spraying before signs of the disease appears, in late May if the season is advanced, or early June if the season is late, spray every ten days to two weeks throughout the summer (until late August).

** **

NAME: Picea abies, Norway Spruce
HABIT: Evergreen Tree
(also dwarf form on site)

SOIL pH: 5.5-6.0.

FERTILIZER REQUIRED: If lawn or bed beneath is fertilized this will suffice.

EXPOSURE: Sun.

GENERAL CULTURE: Requires a moderately moist, sandy, well-drained soil.

PRUNING REQUIREMENTS: Prune to restore shape or to remove damaged parts.

INSECTS:
- Spruce Gall Aphid. Elongated, many-celled, cone-shaped galls less than 1" long result from feeding and irritation by this pest.
- Spruce Bud Scale. Globular red scales, 1/8" dia. infest twigs.
- Spruce Needle Miner. Light greenish larvae web leaves together and mine the inner tissues. Leaves turn brown. Adult is grayish moth.
- Spruce Spider Mite. Yellow, sickly needles covered with fine silken webbing. Young are pale green, adult is greenish-black.

** **

NAME: Pinus strobus, White Pine
(See under Olmsted Historic Site, Section C-I)

** **

NAME: Primula vulgaris, Primrose
HABIT: Perennial

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Partial shade.
FLOWERING PERIOD: May.

GENERAL CULTURE: Require a rich, moist, well-drained soil. Moisture is of utmost importance. A summer mulch is also important to keep the soil cool and the moisture content even. Over the winter some planners may die out so spring replacements may be necessary. A winter mulch helps to preserve the plants.

INSECTS:
- Aphids. Four species infest the leaves.
- Corn Root Aphid. Feeds on roots causes leaves to turn yellow and plants to develop very poorly.
- Beetles. Four species.
- Mealybugs.
- Black Vine Weevil. Black snout 3/8" long feeds on roots and tunnel through finally invading the crown.
- Two-Spotted Mite. Causes foliage to turn yellow in summer.

* * *

NAME: Prunus (Cherry, Peach)
(See under Olmsted Historic Site, Section C-I)

* * *

NAME: Prunus glandulosa, Flowering Almond
- Prunus japonica
- Prunus triloba

HABIT: Deciduous Shrub

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSED: Sun.

FLOWERING PERIOD: Late May, early June.

GENERAL CULTURE: Require a rich, well-drained soil.

SPECIAL PRUNING REQUIREMENTS: Renewal as described in text.

DISEASES:
- Die-back. Branches die back to ground. Cut out and burn.

* * *

NAME: Rhamnus

(See under Olmsted Historic Site, Section C-I)

* * *
NAME: Reseda odorata, Mignonette  HABIT: Annual

(See Petunia, this section)

***

NAME: Rhododendron species  HABIT: Shrub

SOIL pH: 5.5.

FERTILIZER REQUIRED: As described in text.

EXPOSURE: Partial shade.

FLOWERING PERIOD: Depends on cultivar by usually late May or early June.

GENERAL CULTURE: A humusy soil is required. Roots are very near to the surface so if cultivation is required for weed control, keep it shallow (upper one inch). A summer mulch is preferable. An even water supply is essential. Make sure that plants have plenty of water as they go into the winter because they give off water all winter through their leaves (as well as in the summer). Test soil every two years to make sure pH level is kept low. Dead-heading the plants is essential for even blooming. Extreme care must be used to remove the head without injuring next year's bud, but the bud does snap off easily with a gentle twist.

INSECTS:

Lace bug appears on undersides of leaves. Control: use soap emulsions as more potent sprays are not permitted.

There are other insects to be aware of such as stem borers, but these are not as common.

***

NAME: Ribes sativum, Scarlet Currant  HABIT: Deciduous Shrub

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: Late April, early May - fruit in July.

GENERAL CULTURE: Requires a rich, well-drained soil, and moderate moisture. Plants are easy to grow. If fruit is desired, the plants may have to be protected from the birds.

SPECIAL PRUNING REQUIREMENTS: Renewal pruning as described in text taking out 1/3 of the older wood to the ground each year.
MOST COMMON PESTS:

INSECTS:

Currant Aphid. Leaves are curled, crinkled, or humped up by this pinkish, yellowish or dark green aphid. Curled areas turn red.

Imported Currant Worm. Dark green with black spots. Larvae eat small holes in leaves. All leaves can be eaten up by heavy infestation.

Scales. Seven species infest Ribes.

Currant Bud Mite. Buds do not open and the infested canes die or develop abnormally.

NAME: Rosa species, Rosa

(See under Olmsted Historic Site, Section C-I)

NAME: Salvia coccinea, Scarlet Sage

HABIT: Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: June throughout the summer.

GENERAL CULTURE: A well-drained, moderately moist, rich soil is required. Plants grow erect and upright not requiring staking. Keep faded flowers clipped off for continual flowering. Summer mulching is useful.

INSECTS:

Asiatic Garden Beetle. Chewing insect.

Stalk Borer. Larvae that bores stem.

NAME: Spirea prunifolia, Bridal Wreath

Spirea x Van Houttei, Bridal Wreath

(See under Olmsted Historic Site, Section C-I)

NAME: Syringa vulgaris, Common Lilac

(See under Olmsted Historic Site, Section C-I)
NAME: Taxus cuspidata, Japanese Yew
(See under Olmsted Historic Site, Section C-I)

***

NAME: Thuja occidentalis, Arborvitae

HABIT: Evergreen shrub

SOIL pH: 5.5-6.5.

FERTILIZER REQUIRED: Regular feeding as described in the text.

EXPOSURE: Sun, partial shade.

GENERAL CULTURE: Needs a well-drained, rich, and moist soil. Tends to brown under high winter wind conditions. If the shrubs are multi-stemmed it is good to tie the shrub together before the heavy winter snow and ice storms to prevent the branches spreading apart and breaking.

PRUNING REQUIREMENTS: Prune as any other evergreen (see text).

INSECTS:
- Bagworm. Caterpillar builds around itself an elongated sac, 2 or 3 inches in length. Adult stage is a moth.
- Mites. Sap-sucking pest turns leaves brown. In severe infestations it produces a fine silken webbing over the leaf surfaces.
- Leaf Miner. Leaf tips turn brown as a result of the feeding within the leaves of the small leaf miner maggot. Adult stage is a tiny gray moth.
- Weevil. White to pink larvae with brown heads feeds on roots. The adult, covered with greenish scales, feeds on the upper parts from May to July.

***

NAME: Thunbergia grandiflora, Clockvine

HABIT: Annual Vine

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: May throughout summer.

GENERAL CULTURE: Requires a rich, well-drained soil. Staking or a trellis support is required. Because the vine is annual, it should be dug and discarded in the autumn, at garden clean up time, and new ones planted in the spring after danger of frost has passed (late May).
PRUNING REQUIREMENTS: Prune out long, rampant stems that cannot be trained on support.

MOST COMMON PESTS:
INSECTS:
Aphids. Sucking insects.

NAME: Tilia americana, American Linden  HABIT: Tree

GENERAL CULTURE: See Tilia under Olmsted Historic Site, Section C-I, for general culture. The tree at Longfellow Historic Site is a large and ancient specimen. Care must be taken to see that the existing cabling remains intact, that damaged wood is removed. As seedlings occur beneath the tree or in limb crotches, these should be transplanted into a nursery to use when the old tree dies.

NAME: Tsuga canadensis, Hemlock

(See under Olmsted Historic Site, Section C-I)

NAME: Ulmus americana, Elm

(See under Olmsted Historic Site, Section C-I)

NAME: Verbena bipinnatifida, Verbena

(See Petunia, this section)

NAME: Viola cornuta and species, Violets  HABIT: Perennial

SOIL pH: 6.0-6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: May.

GENERAL CULTURE: Very easy to grow. While a rich garden loam is desirable, they are not particular. Even soil moisture
is also ideal. The seedlings which volunteer may become invasive, but they are easy to pull out.

***

NAME: Viola tricolor, Pansies

HABIT: Biennial, treated as an Annual

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun, partial shade.

FLOWERING PERIOD: Late April through summer (see below).

GENERAL CULTURE: Plant in a rich, well-drained, moderately moist soil. Keep faded flowers picked off for continuous blooming. If this is done and season is not too hot, they will bloom throughout the summer. Replant each year. When plants get too leggy, trim them back to encourage lateral growth.

INSECTS:

Cutworms. Four species attack in the spring. Mealybugs.
Violet Sawfly. Leaves are eaten by bluish-black larvae 1/2" long. Skeletonize the leaves; later they eat out holes.
Slugs. Slimy tracks where they have crawled away after eating holes in the leaves.

***

NAME: Wisteria japonica, Japanese Wisteria

HABIT: Vine

SOIL pH: 6.5.

FERTILIZER REQUIRED: Regular feeding as described in text.

EXPOSURE: Sun.

FLOWERING PERIOD: Late May, early June.

GENERAL CULTURE: Plant requires rich, well-drained soil. It should be grown on a trellis and trained to stay within bounds on the trellis. See text under pruning for any problems related to flowering.

SPECIAL PRUNING REQUIREMENTS: Prune to keep in bounds. See text concerning the appearance of flower buds, that should not be removed, as opposed to vegetative buds.

***
SECTION D - RECORD SHEETS
DAILY MAINTENANCE RECORD FOR _____ SITE

DATE: ____________________ DAY OF WEEK: ____________________

NAME OF PERSON FILLING OUT RECORD: ____________________

POSITION: ____________________

<table>
<thead>
<tr>
<th>Job Completed or in Process</th>
<th>Special Equipment or supplies needed to perform job and quantity used.</th>
<th>Total time for job</th>
<th>Total Number of Man Hours</th>
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MONTHLY SUMMARY OF GROUNDS MAINTENANCE

SITE: __________________________

MONTH: ________________________ YEAR: ________________________

PERSON COMPLETING THIS FORM: __________________________

<table>
<thead>
<tr>
<th>JOBS COMPLETED*</th>
<th>MAN HOURS REQUIRED</th>
<th>NOTES OR COMMENTS</th>
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</thead>
<tbody>
<tr>
<td>*Divide into categories (lawns, flowers, trees, shrubs, etc.) use separate sheet(s) for each.</td>
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