

Minnesota Nurserymen's newsletter



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MANAGING NURSERY SOILS

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The concept of good soil management is based on the principles of maintaining a good structure and having the proper fertility balance. A well managed soil should form friable clumps or aggregates which allow water penetration, good drainage and at the same time retain the maximum amounts of moisture for good crop growth. Such a soil will aerate readily and will warm up quickly in the spring.

First of all, a nurseryman should choose his site carefully, because it is far easier to start with a good soil than build up a poor one. All nursery soils are being depleted in fertility from the growing of nursery crops and from erosion if the land is sloping. Erosion will be increased by running the rows up and down the slope and by continuous cultivation.

In addition to these two problems of maintaining good soil management, the nurseryman has the problem of hauling away large amounts of the top soil on balled and burlapped evergreens. This loss is an additional problem to soil losses caused by erosion.

Erosion losses, with a clean cultivated crop grown on a 7 to 8% slope with normal rainfall, will amount to 35 to 40 tons of soil lost per acre per year. In four years a total of at least 1 inch of soil, plus all the nutrients, will be lost over a given area. Add to this possible soil erosion, loss of what will be removed and hauled away by balling and burlapping of evergreens. Here the percentage of top soil removed depends on the planting, spacing and the size of the ball dug. Figuring spacing at 42-inch rows and 36 inches in the row, and the balls dug at 15-inch depths, the following approximate percentages of soil to the 15-inch depth are removed: 15-inch balls - 10%; 18-inch balls - 15%; 24-inch balls - 25%; and 30-inch balls - 40%. This is a heavy loss of top soil each time a crop of evergreens is removed with a ball of soil, and this condition must be corrected before the soil is again in good condition to produce nursery crops. Add to this loss of top soil by balling and the loss that may occur from erosion, all of the top soil which may be removed and lost during the time it would take to produce 50-year-old evergreens. Add to this also, the loss of plant nutrients of nitrogen, phosphate and potash. This may run into several hundred dollars per acre in terms of replacing the nutrients on a commercial fertilizer basis.

With these problems of management, keeping a nursery soil permanently productive calls for a program of balanced soil fertility and management.

An adequate concept of management must include the conservation of plant food nutrients, for without these, productivity cannot be maintained and erosion cannot be controlled. Such a system must be based on the following six points: (1) Drainage and cultivation, (2) Liming acid soils, (3) Supplying adequate amounts of organic matter, (4) Good crop rotation, (5) Using commercial fertilizers, and (6) Erosion control practices.

With good drainage, plant roots may grow down as much as five feet, while with poor drainage root growth maybe limited to a foot or less. Well-drained soils also warm up earlier in the spring and are less subject to frost heaving.

Proper cultivation, like drainage, encourages soil granulation and aeration. Cultivation mixes crop residues and manure with the soil, thus helping to maintain organic matter. It also conserves moisture by helping soil to soak up rain instead of letting it run off.

Liming is the foundation of a good soil management program where soil is acid. Tests should be made before liming to determine actual needs. Lime, on acid soil, is essential for successful legume growth which indirectly helps other crops.

Organic Matter is the life of the soil and the storehouse of fertility. Organic matter may be maintained and increased by adding barnyard manure at 10 to 20 tons per acre, growing and turning under green manure crops and the returning of all other crop residues. The effects of organic matter in the soil are: (1) Contains reserve supplies of plant nutrients, (2) Feeds a vast population of microorganisms in the soil, (3) Maintains physical condition of the soil, (4) Increases the intake and movement of water in the soil, and (5) prevents erosion. In nursery soil management, the crop rotation system is the basis for maintaining organic matter.

A well developed crop rotation plan for nurserymen involves the use of sod, green manure, fall cover and companion crops alternated with or accompanying the nursery crop. Such crops may include soybeans, millet, buckwheat, fall rye, spring small grains and sudan grass followed by a sod crop of a mixture of legumes and grasses. One of the best methods is the use of sod crops. Evidence would seem to indicate that even with the extensive use of green manure crops, it is barely possible to maintain the organic matter content of the soil. There is little precedent to follow, but nurserymen may be able to obtain the desired results by having the land in sod or green manure crops 30-40% of the time. The length of time it takes to produce a salable crop of nursery stock and the method followed in digging the crops are factors influencing the rotation adapted. If shrubs, fruits and small trees are grown, the digging and removal of topsoil

does not contribute to the soil loss as compared to the loss from the balling and burlapping of evergreens. Here is where adjustments in the rotation should occur. Sample rotations may be as follows:

Rotation (a) Nursery stock (shrubs and fruits) two and three years. No soil removed at digging time.

1. Nursery stock two or three years.
2. Green manure crop and fall cover crop after nursery crop is dug in third year.
3. Grain seeded with legumes and grasses to remain on the land two to three years. Clip and leave all residues on the land.
4. Repeat the rotation.
5. Use annual grains each year for fall cover between rows of nursery crop or straw as a mulch or an application of barnyard manure.
6. Fertilize with commercial fertilizer at the time of seeding the grain and legume grass sod and again when the sod is plowed for new nursery planting.

Rotation (b) Nursery stock (evergreens) four or five years. Stock dug with ball.

1. Nursery stock four or five years.
2. Use green manure crop and fall cover crop after nursery stock is dug in fifth year.
3. Grain seeded with legumes and grasses to remain on the land three or four years. Clip and leave all residue on the land.
4. Repeat the rotation each year.
5. Use annual grains each year for fall cover between the rows of nursery crops or straw as a mulch or an application of barnyard manure.
6. Fertilize with commercial fertilizer at the time of seeding the grain and legume and grass sod and again when the sod is plowed for new nursery planting.

Commercial fertilizer is an essential to nursery soils if the proper balance of plant nutrients is to be maintained. It is wise to base fertilizer applications on soil tests, but frequent testing will be necessary and records must be kept if the tests are to be interpreted correctly. Usually one test in each rotation cycle is sufficient. The suggested rotations indicate when the fertilizer may be applied in the rotation. Nitrogen, phosphate and potash are generally the nutrients most lacking in Minnesota nursery soils. The University of Minnesota department of soils maintains a soil testing laboratory to provide this service to farmers, nurserymen and others. See your county agent for further information.

Erosion control practices should be a part of any nursery soil management program. The practices should include grassed waterways, contour strip cropping, terracing, mulches and cover crops. Nurserymen should plan their layout so as to fit the lay or slope of the land so all cultural practices will be on the contour and around the slope. Contour planting will serve as a dam to stop the flow of water down the slope. Strip cropping includes alternate strips or buffers of sod and nursery stock. Terraces are division channels around the slope to carry away excess runoff water slowly into grassed outlets so no excess washing can occur. Grassed waterways are strips of sod left permanently in natural water courses to allow excess water runoff, but at the same time give protection from gully formation.

If these six principles of soil management are properly applied, nursery soils can be maintained and improved. In some cases all practices are essential, while in others only certain ones are necessary. There is no substitute for good soil fertility and management.

PLANT MINNESOTA PROGRAM AGAIN BEING CONSIDERED

Eldred M. Hunt
Sec'y, Minnesota Horticultural Society

The possibility of activating a "Plant Minnesota" program is being investigated by an informal committee of representatives of state-wide horticultural interests. Dr. Snyder, head of the University's department of horticulture, called the group together after conferences with W.A. Coupanger, Minnesota Nurserymen's Association president, horticultural Society members and other who had indicated a possible interest in such a program.

Dr. Snyder was named temporary chairman at the first meeting, held on the University St. Paul Campus on March 29. There appeared to be agreement among the 14 persons who attended that a promotional program would be desirable similar to the very successful "Keep Minnesota Green" program but confined mainly to the promotion of home and ornamental plantings.

It was suggested that the State Horticultural Society might be the logical organization to promote the Plant Minnesota Program, inasmuch as it represents more than 300 affiliated groups throughout the state whose members are interested in this type of planting and might furnish some of the wide-spread leadership necessary to the success of the program. The necessity was pointed out of finding additional leadership to head the state committee, as well as financial assistance, regardless of what organization is to be the direct sponsor.

A sub-committee was appointed to outline a possible more specific procedure in activating a program and to suggest a permanent chairman for the committee. The first meeting of the sub-committee was held on April 5.

Report from Twin City Nurserymen's Association

Russ Zakariasen
President, Twin City Nurserymen's Association
Homedale Nursery, Hopkins

Many nurserymen have commented on the "Buy Locally" advertising campaign started in the Minneapolis and St. Paul papers by the TCNA. We have been urging the public to patronize local nurseries rather than distant, out-of-state or mail-order type nurseries.

This year we plan to step up the program and carry some larger ads with change of emphasis. We now intend to try to sell particular items, at the same time explaining why it is to the customer's advantage to buy from local firms.

For instance we may run a large ad on evergreens explaining how, why and what they will do for a home and then explaining the benefits of patronizing a Twin City nursery where trees may be selected for exact size and good appearance and backed up for growing qualities. This is a more positive approach and should bring definite results. Our advertising budget for this year should exceed \$1000. Look for the ads in the Minneapolis and St. Paul papers.

Considerable study has been given by members of the TCNA to hourly costs of performing landscape work. So far, the study indicates that the cost, including overhead, depreciation, supervision, insurance, transportation, small tools, etc., averages around \$2.85 per man per hour. This cost has nothing to do with the sale of nursery stock, garden tools, fertilizer, insecticides, etc., but only concerns labor furnished for construction, planting, lawn work, sodding, etc. How does the figure compare with your cost?

Members of the TCNA report evidence of continued high interest on the part of prospective customers for landscaping or nursery stock, which seems to indicate that we are going to have a good business year.

Spring Insect Problems in the Nursery

W. P. Trampe
Supervisor of Nursery Inspection

Cutworms

Nature of Damage on Nursery Stock Cutworms have been observed in several types of broad-leafed nursery stock at various times. It is logical to assume that nurserymen are beginning to notice cutworm damage at this time.

Damage occurring on nursery stock is somewhat different from cutworm damage appearing on susceptible farm crops. In the nursery, damage is generally limited to feeding by climbing cutworms. These insects hide in the soil by day and then crawl from their hiding places at night to climb up the various kinds of nursery stock and feed upon the tender young foliage.

Certain tender perennials and annuals may be attacked by cutworms which will cut the plants off at the ground line. This type, like practically all cutworms, feeds only at night.

Control A sprayer of the type used for applying weed-icides may be used where the stock has not been planted. If the stock has been planted and is leafed-out, a weed sprayer may be used satisfactorily if it is equipped with nozzles. These nozzles should be dropped in such a manner that the spray mixture settles on the surface of the ground and not on the foliage of the plant. If the sprayer has been used for spraying weeds, it should be thoroughly cleaned (use 1 qt. of household ammonia in 25 gallons of water) and rinsed before using it in the nursery.

One gallon of a 25% emulsifiable concentrate of DDT may be used in 25 gallons of water and applied to one acre, according to the manner suggested.

An emulsifiable concentrate of chlordane, which contains 8 pounds of chlordane per gallon of concentrate, may also be used at the rate of 1 pint to 25 gallons of water per acre.

Two pints of an 8 pound emulsifiable concentrate of toxaphene may be used to 25 gallons of water and applied to each acre of stock.

Wettable powder and dust formulations of the above mentioned materials may be used with safety. DDT should be applied at the rate of 1½ pounds, chlordane at 1 pound and toxaphene at 1½ to 2 pounds of the technical product per acre of crop treated.

Cankerworms

Nature of Damage on Nursery Stock Fruit trees, shade trees and shrubs are susceptible to cankerworm damage, which usually appears as soon as the leaves of susceptible stock unfold in

spring. The damage is done by shot-holing, skeletonizing or possibly by defoliating the plant.

Control One gallon of 25% emulsifiable concentrate of DDT per 100 gallons of water applied to the foliage of the infested stock is an effective control. Application may be made by using a sprayer which has a gun attachment. The operator of the gun may ride on the spray machine, directing the spray in the desired direction, as the machine is driven along the nursery rows. Mist blowers are also effective on some types of nursery stock. When using a mist blower a 25% emulsifiable concentrate is mixed by adding 1 gallon of this concentrate to 10 gallons of water.

Forest Tent Caterpillar

Nature of Damage on Nursery Stock Nurseries north of a line which runs east and west across the state through St. Paul and Minneapolis may, in many instances, find forest tent caterpillar damage in their broad-leafed nursery stock this year. Tiny hairy black caterpillars hatch out when the trembling aspen is leafing out in the spring. The caterpillar may be definitely identified as it becomes mature by the white key-hole markings which run down its back.

Control It is important for nurserymen to inspect all susceptible stock closely for forest tent caterpillar infestation now, because chemical treatment is considerably more effective against these insects if it is applied before they are mature. The same treatment may be used for the control of forest tent caterpillar as that which is recommended for the control of cankerworms.

The Application of Insecticides by Airplane

The nurseryman may find the airplane a valuable adjunct for treating nursery stock under certain conditions. If nursery stock is so arranged that it is difficult to apply insecticidal treatment by ground sprayer, quite often an airplane can be employed to advantage. When weather conditions make fields impassible for wheeled machines, an airplane can probably solve the problem. All three of the insects referred to above can be controlled through the use of an airplane in the application of the chemicals. Any nurseryman interested can contact his nearest airport for names of aerial sprayers who can make an estimate for the job required.

Insecticides - Extension Bulletin No. 263

Dr. L. K. Cutkomp's recently revised bulletin is now available. It is a valuable reference for anyone who may have the occasion to use insecticides. This handy little booklet may be obtained from your county agent or directly from the Bulletin Room, University of Minnesota, Institute of Agriculture, St. Paul 1, Minnesota.

Small Amount of Spray

So often a customer asks, "How do I mix up a gallon of spray? All recommendations seem to be for such large quantities."

It is impossible to give exact figures for many different insecticides, for small amounts commonly recommended for the home gardener in the measuring units he knows and uses. Commercial insecticides vary in bulk per unit weight. Thus, to be accurate, one would have to use specific amounts for each insecticide.

Here are broad recommendations which might be used:

1 level teaspoonful per gallon of water is approximately equivalent to 1 pound of 50% wettable powder per 100 gallons of water.

1 level teaspoonful per gallon water is about equal to 1 pint of liquid insecticide per 100 gallons of water (A common liquid concentrate contains 2 pints of insecticide, DDT for example, in a gallon of concentrate).

1 level tablespoonful per gallon of water is about equivalent to 3 pints of liquid insecticide per 100 gallons.

CHEMICAL THINNING OF ORNAMENTAL CRABAPPLES

Dr. W. G. Brierley
Professor of Horticulture
University of Minnesota

Elgetol or Krenite are caustic sprays formerly used to remove a large percent of apple blossoms and thus thin the set of fruit. Both chemicals tend to scorch the foliage, and as they destroy blossoms, would not be of value with ornamental crabs.

Another chemical used in apple thinning goes by the name of "Stafast" or "Stopdrop" in stores. All are forms of naphthalene acetic acid. For orchard thinning the strength ordinarily used is 8 oz. of the dry powder in 100 gallons of water. You can figure the amount to use in your own sprayer. In an attempt to over-thin, or to remove the set of apple trees completely, we used "Stafast" at three times the usual strength, or at the rate of 24 oz. per 100 gallons of water. This application does not remove all fruit from the trees but took off about 80 per cent. If you use this strength on your flowering crab tree just after the petals have fallen, probably you will remove enough of the set to lessen your trouble with fallen and decaying fruit. Worth a trial at least!

Ornamental Horticulture Is Big Business

Dr. L. C. Snyder
Head, University of Minnesota
Department of Horticulture

Gardening has become America's number one hobby. Last year home gardeners spent one and one half billion dollars on their hobby. Of this amount, five hundred million dollars were spent for ornamental planting stock.

It is estimated that 30 million Americans will engage in some gardening activity this year. Some of these will be gardening for the first time and many others would be considered strictly amateur in their knowledge of plants. These inexperienced gardeners are easy prey for faulty advertising and unscrupulous dealers in nursery stock. The results which these gardeners obtain in their first gardening efforts may well determine whether they will confine gardening as a hobby. The entire nursery industry suffers when tender or undersized stock is sold. If a home owner plants a seedling magnolia or tulip tree and it dies the first winter, he loses confidence in nurseries in general.

Just how to combat this faulty advertising is the \$64 question. There seems to be no way to stop a company from advertising in newspapers or over TV and radio stations. We have appealed to the newspapers, radio stations, and the advertisers themselves with little results. Apparently the only sure way to combat this menace is through education and this method may well be too slow.

Perhaps if more of our Minnesota nurseries would use the advertising media to sell worthwhile plants, the effect of faulty advertising could be minimized. If it pays to advertise tender plants in this area, it certainly should pay to advertise hardy, adapted plants. If enough Minnesota Nurserymen would advertise in our papers and over radio, it would certainly be a good argument to force our papers and radio stations to give up certain questionable ads.

Comments from the Editor

Richard J. Stadtherr
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St. Paul 1, Minn.

We need your catalog or price list for our files. We receive many requests of where people can buy various plant materials and we would like to recommend several nurseries closest to the person making the request. We recommend nurseries which we know have the materials, but we can't recommend your nursery if we don't have your price list. Please send me your catalog, for we like to recommend Minnesota nurseries always.

The excellent Nurserymen's Information Letter for April from the State Entomologist's office should be useful throughout the summer. It will tell you how to identify and control all of the troublesome insects.

Mr. Walter Trampe, supervisor of Nursery Inspection, informed me that the State Entomologist's office will send out its letter between our newsletter. By following the Information Letter and the Newsletter you will thus be able to achieve good control of insects throughout the year. He has agreed to write a column for each Newsletter so we can keep you well informed on insect control.

MALATHION

We are impressed by the favorable reports being received of Malathion as an all-round insecticide. A close chemical relative of the powerful and poisonous commercially-used Parathion, it possesses many of its insecticidal properties but at the same time is much less toxic to man and warm-blooded animals. Reports of 1953 and previous years indicate Malathion to be an effective weapon for use against a wide range of insects affecting ornamentals, vegetables and fruits--scales, aphids, lacebugs, mealy bugs, some leaf miners and most leaf-chewing insects. It seems to come about as close to an "all purpose" insecticide for home garden use as anything we have at the present time. Malathion is available this year in garden supply stores under various trade names. Several companies are using the basic chemical in formulating their garden insecticides. Read the ingredient statement on the package and follow directions.