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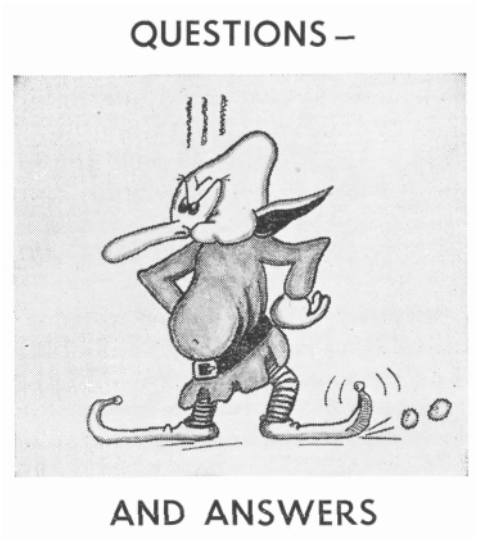

SOIL FOR AVOCADOS

Q. What is the best soil for growing avocado trees?

A. Avocados do well on a wide range of soils. Avoid poorly drained and excessively heavy soils. Hill sides are not necessarily well drained. Shallow soils will produce small trees, but if the climate is right they will yield well for their size. Planting closer will help to offset the small tree effect on yield. An avocado site should be selected first on history of production in the area, and second on the type of soil.

VARIETIES

Q. I hear all kinds of recommendations on what varieties of avocados to plant. What is the best variety to plant from the standpoint of income to the grower?

A. There are a number of good varieties that can be planted as far as income to the grower is concerned. The California Avocado Society Variety Committee recommends varieties for each avocado growing district of the state. These recommendations should be given first consideration for your locality. They are based on past performance and returns to growers. Other varieties should be planted only on an experimental basis. Your local farm advisor will give you more detailed information for your locality.

ROOTSTOCKS

Q. What is the best rootstock to use for Fuerte avocados?

A. There is no evidence that one rootstock is better than another for any variety of avocado. Choice should be limited to the strongest growing individuals on any of the commonly used rootstocks. Research is being conducted to determine the influence of the various species of rootstock upon avocados. To date no particular rootstock has shown any superiority to any other. These experiments, however, are only four years of age so no conclusions can yet be drawn. They are located in all avocado districts of the

state.

ROOTSTOCKS AND FROST

Q. I have heard that avocados on Guatemalan rootstocks are more susceptible to frost injury than those planted on Mexican rootstocks. Is this a fact?

A. There is no good evidence that trees on Guatemalan seedlings are more susceptible to frost injury than those grown on Mexican seedlings. Guatemalan strains in themselves are more easily damaged by frost than Mexican and hybrid varieties, but generally the rootstock is buried so well that any danger of frost is negligible. Trees budded or grafted high might have Guatemalan bark exposed which would be injured by extremely cold weather.

TIP GRAFTS

Q. What is a tip graft and how does it differ from standard nursery trees?

A. The only differences between a tip graft and a standard nursery tree are in the method of propagation, the age at which the tree is set out in the orchard, and the care the first year. In a tip graft the bud is grafted directly on the tip of a five or six month old seedling. When the bud has grown three or four months it may be set out in the orchard. In a standard tree the bud is inserted four to six inches above the ground on the side of a year-old seedling. The bud is then grown approximately a year in the nursery before it is set out in the field. Tip grafts require greater care the first year in the field. As far as fruit production is concerned, there is no difference between a tip graft and a standard budded tree.

CUTTING BACK NURSERY TREES

Q. Should nursery trees be cut back after they have been set in the field?

A. The cutting back of nursery trees at planting depends largely upon the state of growth of the young tree. If it is beginning to grow it should not be cut back. Trees which are dormant, however, should be cut back to the first main whirl of buds. It does not make much difference whether that whirl occurs high or low on the trunk of the young tree. The result will be a satisfactory growth in either case. Nursery trees should not be over 1 year old and well grown to get best results. Two to three year old trees which are 5 to 6 feet tall should be cut back severely even though growth may have begun.

YOUNG TREE PROTECTION

Q. What is the best method for protecting young avocado trees from cold weather?

A. The first and best protection for young avocado trees is never to plant them in areas which are susceptible to extremely low temperatures. In border-line areas, the best methods of protection are to mound the soil around the trees and wrap the trunks. In mounding around the tree the soil should be piled high enough to cover eight to ten inches of the trunk above the bud union. The second method, and one most commonly used, is to wrap the trunk in a thick layer of newspaper. These methods do not protect the top of the tree that is exposed. Corn stalks placed tightly around the trunks of young trees in two layers and tied securely will give a little more protection to the small branches. They are somewhat more costly and are harder to handle. Individual orchard

heaters for each tree will, of course, give protection, but are quite expensive to buy and to maintain.

IRRIGATING YOUNG TREES

Q. How often should newly planted avocado trees be irrigated?

A. Young avocado trees should be irrigated every seven to ten days the first year they are set in the orchard. The interval of irrigation will depend entirely upon the type of soil in the ball and in the orchard surrounding the ball. With extremely hot, dry weather there will be some cases on light soils where every seven days will not be frequent enough. Experience alone will tell you how often you should irrigate under your conditions. A straw or low grade manure mulch in the basin around the tree will do considerable toward keeping the top roots around the tree moist between irrigations.

FERTILIZING NEW TREES

Q. Some nurserymen say that a newly planted tree should not be fertilized while some of the growers are of the opinion that fertilizer will help new trees. What are the facts concerning this?

A. There are some soils which are so fertile in themselves that additional fertilization will yield no benefit on young trees. In land that has been cropped previously, and on very open gravelly types of soil it is advisable to apply frequent small amounts of nitrogen fertilizer to young trees. The additional cost is not great and it will insure the trees against a nitrogen shortage which will tend to reduce growth.

BARNYARD MANURE

Q. Is barnyard manure essential for the production of avocados?

A. There is no evidence that barnyard manure is essential for the fertilization of any crop. It does, however, provide a large amount of organic matter which is helpful in maintaining the physical structure or tilth of the soil. This is particularly true where cultivation is practiced. Good tilth provides better water penetration, aeration, and subsequently better root development and tree growth. Furthermore, manures provide large quantities of phosphate and potash, as well as small amounts of other minerals which are essential for plant growth. While it has not been shown that phosphate and potash need be added in California soils, the applications of manure will delay the day when those materials might have to be applied by the grower.

A FERTILIZER PROGRAM

Q. There seems to be considerable difference of opinion on how to fertilize avocado trees. Can you suggest a program which would be satisfactory in most cases?

A. While there is no definite scientific information on a satisfactory fertilizer program for avocados, the following program should maintain most orchards in a satisfactory condition. Apply two to three pounds of actual nitrogen per year, one-half in the form of simple chemical fertilizers, and the other half in the form of animal manures. Passing up manure for 2 or 3 years will not make any measurable difference in the production of the orchard. In this case all the nitrogen should be applied as simple nitrogenous chemicals.

ZINC DEFICIENCY

Q. What is the best spray formula for the control of zinc deficiency, and when should it be applied?

A. For the control of zinc deficiency, or mottle leaf as it is sometimes called, the best spray is composed of 5 pounds of zinc sulphate and 4 pounds of hydrated lime, to 100 gallons of water. In some areas of the state 2 pounds of zinc oxide to 100 gallons of water is used. The safest spray, however, from the standpoint of leaf burn is the zinc sulphate spray.

The best time to apply zinc is in the spring of the year just prior to the spring flush of growth. Severe cases of zinc deficiency which have caused defoliation as well as little leaf will require a second spray in the fall of the year. The same formula should be used at that time.

IRON CHLOROSIS

Q. I am told that the bright yellow color which appears on some of my avocado leaves is caused by a lack of iron. Is this true, and what can I do to correct it?

A. The trouble known as iron chlorosis, or lime-induced chlorosis, is quite common in all high-lime soils in California. Your description of your trouble sounds as if it might be caused by lack of iron. There is no leaf spray nor soil treatment which is satisfactory for the correction of this nutritional disease. The only thing known that will be of any benefit is to dry the soil well between each irrigation. Maintaining the soil moisture at too high a level will make the chlorosis worse. Drying it out may improve it but will not necessarily correct it entirely.

SUNBLOTCH

Q. What is sunblotch and does it hurt avocados?

A. Sunblotch is a virus disease of avocados which is distributed through taking buds, grafts, and seed from affected trees. In severe cases trees may be stunted and yields low. Fruits with sunblotch streaks on them are lowered in grade and bring reduced returns to the grower.

SUNBLOTCH THROUGH SEEDS

Q. Can sunblotch be transmitted through seeds taken from sunblotch affected trees?

A. Yes.

SUNBLOTCH TRANSMISSION

Q. Can sunblotch be carried from one tree to another on pruning tools and picking poles?

A. No.

AVOCADO ROOT ROT

Q. Will soil fumigation eliminate root rot so that the ground can be replanted successfully?

A. The work on soil fumigation has not yet been in progress long enough to determine

whether or not trees can be grown to maturity on treated ground. Soil fumigation should be considered only experimental as there is no assurance that trees will not become reinfected after five or six years.

ROOT ROT AND IRRIGATION

Q. What is the cause of avocado root rot, or decline, as it used to be called?

A. All work done to date on this project indicates that avocado root rot is caused by a certain "cinnamon" fungus in the presence of excessive soil moisture. It is not known how the cinnamon fungus was introduced into, or spreads in, avocado areas. Excessive moisture in the soil is due primarily to poor drainage or excessively slow drainage. Root rot conditions are aggravated by seasons of excessive rainfall. Such conditions have not existed for the past five years. Poor distribution of irrigation water is the major contributing factor in keeping soils excessively wet and so increasing the hazard from root rot. Good irrigation water distribution will help limit the spread of root rot in an orchard and help prevent new infections.

PRUNING

Q. Is it necessary to prune mature avocado trees?

A. There is no scientific evidence of the responses of avocado trees to pruning. There are, however, many observations that have been made by growers throughout the state. As a result, the opinion on the necessity of pruning is quite varied. It is generally recognized that the removal of dead wood in the coastal areas will reduce the incidence of Dothiorella rot on the fruit which is a disease harbored on the dead wood. The most reasonable program of pruning green wood is to remove those branches and limbs which interfere with some other necessary cultural practice in the orchard. Most observers believe that pruning does not affect bearing in any way except to remove some of the wood which might otherwise carry fruit. Some green wood pruning is indicated when orchards begin to crowd and shade out the lower branches on adjacent trees. Under these conditions it seems better to plan a tree removal program rather than try to keep the trees from growing any larger.