

SO YOU WANT TO GROW AVOCADOS

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SOILS

Loam is the ideal soil in which to plant a crop. It is a mixture of sand, clay, and organic materials. Unfortunately, there are very few spots in our territory that are made up of those materials. We are either decomposed granite, clay, or a little of both. The lucky growers are those in old river beds, or deforested areas. There are old tales of people using a half stick of dynamite to blast holes in the granite to plant their trees, but none that tell of having to build dikes to keep the water out. Often, the question is asked, why do you plant trees on hillsides. The answer is very simple. There is no more flat land.

Amended soil is that which has had organic materials such as mulch or animal manure or both blended into it. Because of the lack of required minerals in the DG or clay, it is frequently advised to add one or the other to the planting site.

SPECIES

There is over 300 species of avocado in the world, most of which originated in either Central America or in the islands surrounding Cuba. There are currently being grown in California, not more than a dozen species, primarily Haas, Fuerte, Lamb Haas, Pinkerton, and Bacon. Economics is the driving force for eliminating species that do not meet with the needs of the buyers.

Root Stock

To overcome the difficulties of such problems as root rot" and other diseases, various rootstocks have been cloned and grafted to known producers of high quality Hass, Lamb Haas and others. These trees are then planted in test plots in first, the South Coast Field Station, then in groves throughout the avocado growing areas around the state. They are provided by UCR to individual growers, and monitored several times per year to detect the qualities or lack of qualities that are necessary to produce a healthy, money producing product.

On my ranch I have 400 such trees growing on 20 different root stocks.

Planting method

Outside the dynamite method, there are several variations that include spacing, direction of planting, amended soil, and mounding.

Where there is no evidence of soil fungi, or other possible retardants to growth, it is possible to simply lay out a plot and dig holes large enough to allow the tree to be dropped in and cover up the roots.

Where the topsoil is scarce, it might be helpful to mix aged mulch with the soil that has been removed from the hole. It is also a good practice to surround the trunk out to about two feet with the same, aged mulch.

When working in an area that is known to have a fungus, particularly Phythoptera, the hole should be nearly filled with a new, amended soil, and the root ball completely covered with the same soil. This allows the tree to establish some root growth before encountering less than perfect soil. It is also a great idea to spray the hole and

surrounding area with the proper mixture of "Ridomil" which is an authorized fungicide. At no time is a basin created around the base of the tree.

WATER

The single most costly aspect of growing avocados is water. This can be broken down into several aspects, one is cost. There are several water agencies in San Diego County. Each of these agencies purchase water from senior agency called the Metropolitan Water Board. Each of these agencies pay a different cost for the water because of travel, facilities, and probably use.

In turn, each of these utilities charges a different price for essentially the same reasons. For some unknown reason agriculture has taken a second place to housing and industry.

The standard measure for water is acre foot which contains approximately 325,872 gallons. Prices within the county can reach to over \$800.00 per foot.

Where the rub comes is that each acre of adult trees relies on a minimum of 3 acre feet per year, and recently the Avocado Commission, thanks to the research of UCR stated that if you wish to remain competitive in size and numbers of fruit, you will use 4 acre feet per year.

Simple math tells you that growing avocados is not for the faint of heart, nor the tightness of purse.

The administration of this very expensive commodity is very crucial. One leak from a 1 inch pipe for three days equals 64,800 gallons.

The dispensing, particularly on a mountainside is an art. Pressure regulators, pumps and emitters all come into play. DRIP IRRIGATION ON ADULT AVOCADOS DOES NOT WORK. There are several types of emitters and each type has a different number of gallons per minute/hour. Cheap invites failure. Where wells are used, it is necessary to filter the water to keep out small pieces of rock that will clog the emitters. Well water is not always "good" water as it may contain many minerals that are not necessarily good for the tree. Many times well water is mixed with city water, but must be done in a holding tank that insures that there is no connection between the two sources.

IRRIGATION SYSTEMS

Most city water is delivered in metered systems ranging from one inch to possibly five inches. You would need 300 acres to be granted a system as big as the 5 inch. Usually for an average sized grove a 2 inch will suffice. I have seen groves with as many as five meters from as many as three different water agencies. Most backyard groves have a 1 inch system which limits the quantity of water considerably.

All groves must be divided into smaller areas to accomodate to the amount of water available.

Most irrigations systems follow the contour of the land to alleviate the need for great numbers of pressure regulators. The newer generations of emitters are pressure

compensated; meaning that no matter the inlet pressure (within limits) the output will remain constant.

Most designs of emitters have different flow rates. This is valuable for a couple of reasons: 1. Allows for a greater number of emitters to be on line at one time. 2. Allows for less water on some trees, such as new plants.

Many of our groves are manually irrigated, which means that a person must open and close the valves at the required times, and must examine the entire system for breaks or leakage.

Some of our groves are regulated by clocks, others by gallon limiting valves and others with both.

No matter what the system is, unless it is examined each watering, you could go broke for paying for water that was not going to the right place.

FERTILIZATION

There are 17 minerals necessary to grow trees (or any other plant). They are utilized in varied amounts to support the tree and to grow fruit. These are divided into Macro and Micro nutrients. The Macros include Nitrogen (N), Phosphorus (P) and Potassium (K). These are called Macros because of the amounts being required. N is utilized in making strong wood, manufacturing chlorophyll and as a synergist that aids in the utilization of all the other elements. P is utilized in making leaves and flowers.

Calcium is perhaps the most important element in the tree. Unless it is in the form of Calcium Nitrate fertilizer, it is sprayed on the tree as a micro. The words "Nitrate" means that the calcium does not require modification by the bacteria in the soil to be utilized by the tree. It is a ready

to eat 15.5- 0- 0. It is usually used in the summer and fall applications of soil fertilizer. Zinc is another micro that is very important to the growth of the fruit. It is used only in the apices (tips) of the branches and does not travel well through the vascular system. A popular method to apply is by foliar application. As a matter of fact the entire spectrum of micros, as well as some of the macros can be sprayed directly on the leaves as well as the bark.

GROWTH MANAGEMENT

If allowed, an avocado tree will grow to an excess of forty feet, particularly if it has been fed a diet of high Nitrogen. In the jungles where they originated, sixty feet was no problem for them. The down side of this is that all of the fruit was at the very top. In the past it was common to allow the trees to form a solid canopy, thereby blocking the sun and preventing fruit growth. In recent years the practice has been developed to keep as much of the tree in as much sun as possible, thereby increasing the yield at a much lower height.

Pruning of the trees is not simply lopping off branches it takes some thought to prune the right things at the right time. One must remember that the tree is a living organism and each cut that is made puts the tree into shock. Great limbs being cut off produce a great amount of shock for the tree to overcome. The same can be said of the cutting of many small branches. Most of the shock can be precluded by spraying the tree with a mixture of vitamins, hormones, enzymes and micro nutrition.

Pruning is the prime means of inoculation trees or plants with fungi and bacterial diseases. Care must be exercised to decontaminate all pruning gear before starting on another

tree. A simple mixture of 5% Clorox in water will take care of the problem, but it also corrodes the metal if not rinsed off.

PESTS

There are several pests that either attacks the leaves, or the fruit or both.

The University of California at Riverside through the auspices of the California Avocado Commission acts as our research team. They look for, find, and develop a treatment for each of the pests as they occur. Over the years we have been pestered by such critters as the Brown Mite, Omnivorous Looper, White Fly, Avocado Mite, Avocado Thrip and the most recent visitor, the avocado lace wing.

There are answers for each of these pests, but they are expensive and some times must be repeated. One must really examine the trees on a daily basis to insure that an infestation has not occurred. There are plentiful pamphlets describing the insects and generally the pesticide of choice is included in the information pack.

If you cannot find the authorized pesticide in the printed material, simply go to "avocado.org, then select "pests" and the IPM program from U.C.R. will appear. It will give explicit instructions as to what pesticide, how much, and how often it may be used. I make it a practice to include all the micros in each spray that I do. This helps the tree overcome the damage that the insects may have done.

PESTICIDE REGULATIONS

The regulations start with the federal EPA, trickle down to the state level where they are sometimes strengthened, then they are administered by the counties.

You cannot use any pesticide that is not registered by the state. You cannot use any pesticide unless it is registered for avocados for the specific insect you wish to eradicate.

You must have a certificate issued by the county Department of Pesticide Regulation. To obtain this certificate you must be able to pass a written test having to do with pesticide safety. To maintain this certificate you must obtain continuing education credit by attending periodic meetings sponsored by various sponsors.

Pesticides fall into four categories depending on the toxicity. You will not be able to purchase or use those categories that are restricted.

APPLICATION DEVICES

There are several types of applicators for pesticides beginning with spray bottles up to helicopters. It is obvious that the spray bottle is not sufficient to spray avocado trees, so a system that is capable of reaching the tops of the trees with a volume great enough to cover all the leaves. Unless you own several acres, you will probably rely on a Licensed Pesticide Operator to do your spraying for you. If your trees are less than five years old, you might be able to do the job with a small motor driven unit.

Each pesticide has on the label, instructions as to the safety requirements necessary for not only the sprayer, but your neighbors and any worker that must enter the sprayed area. Many times there is a "re-entry" period. This means that you cannot enter the sprayed area until this time has

expired. When there is a re-entry period, the property must be flagged with warning signs depicting the time that the field will be open.

Also on the label are instructions as to how much to use. Sometimes the directions are for acres, other times for trees, and other times the concentration of pesticide to 100 gallons of water.

YOU MUST FOLLOW THESE INSTRUCTIONS EXACTLY.

Every drop of pesticide you use must be reported to the county. There are forms you can fill out and send in, or you can send them via your computer.

HARVESTING

Most ranchers have an allegiance to a specific packer, others simply wait for a field man to show up and make a verbal contract to pick. Most growers who are not professional farmers see their neighbors picking, so figure it is time and fall in line. This is exactly the wrong thing to do. If you have a FAX machine most packers will send you a daily price quote. Most of the packers have a web site where you can also get daily quotes.

Remember, the quote is what they would pay if your fruit were to be sold that day. If it is held in the cooler for two weeks the price can either go up or down.

Smart growers follow the inventories (which are available several places on the net). Lots of things influence the inventory, such as shipments from other countries, rain, wind, and even heat. To be a good grower, each of these things must be considered before picking begins.

A couple web sites worth remembering are AvoHQ.com and "AviCrane" avicado@primeproduce.com.

CALIFORNIA AVOCADO COMMISSION

The avocado commission was created many years ago to aid the growers in selling the fruit, It has grown to include research on such subjects as selected species, several diseases, larger production, marketing, advertising, etc. It is made up of a board of directors and several board members. There are several committees covering several projects, including a goodly number of researchers at U.C.Riverside.

Their financial support is provided by a market order for the fruit sold by the entire industry. This means for every pound of fruit you sell, you must pay the going rate. The rate varies by species and the amount of fruit available for market.

HAAS AVOCADO BOARD

The Haas Avocado Board was recently created to oversee the production of Haas avocados grown around the world. It has, in a very short time made solid connections to every avocado growing country. It has improved the cooperation of the growers in other countries to level the flow of fruit to the U.S. market, and has established a universal standard for fruit coming to our marketplace.

Now you have the BASICS of being a good avocado farmer. As is with a new job or a new machine, you must pick up on the minutiae to become an expert.

Since having first written this to me, a very serious change has come to our industry. With the advent of the fruit of six different countries sending to us, their fruit to market, we have had to change the standards of excellence for our local fruit to show the consumer that they are being sold the absolute highest quality for the price they pay. What this amounts to is a much more strict grading policy which in turn allows for a lesser amount of fruit to be labeled in the Prime and Standard categories, and more in the #2's and culls.

Because of the great volumes of fruit coming to market, the price is reduced to guaranty sales. The #2 market is sometimes as low as 1/3 of the Standard grade, and of course culls have no return to the grower, and in some cases, there is a negative return.

To remain in the avocado production business, one must adhere strictly to the principles of good farming and be a better farmer than your neighbor.

This means that you have to give your trees exactly those things they need to produce not only a lot of fruit, but large, unblemished fruit as well.

My experience tells me that water must be increased at least 20%, fertilizer applied at the exact right times, and micros applied three times during the growing year. This has said nothing of pests, diseases, heat or cold. All of these must be addressed in a timely manner or you will fail.

This does not bode well for those who are content to farm as they are accustomed. Times have changed and we must abide by the new necessities.