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NECESSARY METHODS FOR IRRIGATION

It is a Scientific Problem and Vital
Principles Now In-
volved.

(By H. L. McIntyre, C. E.)

Don't irrigate too much. Over saturation checks the growth of plants and trees by lowering the soil temperature and at the same time completely shuts out the air. This practice takes money out of the grower's pocket. Roots, like human beings or anything else that breathes, must have air for life and growth. The water-holding capacity of soils runs from 40 to 60 per cent of the total solid volume, and 45 per cent of the whole is about as much water as should be put on the soil at any time. The best result from the application of moisture on ordinary crops have been obtained by using 25 per cent of the water-holding capacity of the soil at planting, decreasing gradually to 15 per cent, remaining at that point until leaves are formed; then, increasing quickly to 40 per cent and allowing the water to fall rapidly to from 12 1/2 to 15 per cent, and remain there during the fruiting and maturing period.

H. L. McIntyre, C. E., an authority on irrigation subjects, emphasized the foregoing points in his paper on "Practical Irrigation," read before the Washington Horticultural Association at its annual meeting in Spokane, December 8 to 12. He indicated that practical irrigation is scientific in form and covers a broad field in its many phases and urged irrigationists to study dry farming methods, as well as read irrigation and farm journals, declaring that the first requisite to be a successful irrigator is to be a first-class dry farmer, adding: "If you can't dry farm, you can't irrigate." Mr. McIntyre said it is the practical side of irrigation that appeals to the farmer and orchardist and fruit grower. They want to know how much water to use, when to apply it and how. To know these things the grower must first ascertain certain facts regarding the land before he is ready to irrigate practically and intelligently. The speaker grouped them as follows:

First—The depth of soil.

Second—The relative position of top and soil.

Third—Slope of surface for drainage purposes.

Fourth—Slope and characteristic of subsoil for under drainage.

Fifth—The percentage of moisture the soil holds stored in its present condition.

Sixth—The water-holding capacity or amount of water the soil contains when in a state of complete saturation.

Seventh—The degree of fineness or grain of the soil.

"With these questions solved," Mr. McIntyre said, "The grower is ready to irrigate with some degree of certainty as to what the result will be; without the facts the grower occupies the position of the head of a mercantile house without his books and statements and invoices. To ascertain these facts is not a complex process as you can see:

"First—The way to ascertain the depth of the soil would be to bore auger holes at short intervals over your tract of land. Bore one foot in depth at a time, pull the auger, save the soil and put it in a glass jar and seal it up to prevent the moisture from evaporating. Bore the second and third foot, and on down to the subsoil in like manner until you have a sample of each foot of soil.

"Second—The relative position of top and bottom soil you have ascertained by boring holes in the first instance.

"Third—If the surface slope is too level to determine by the eye, employ a surveyor to run levels over the ground and furnish you a map showing the elevations in one-foot contours, or in squares of 100 feet. This will always be extremely useful to anyone in the distribution of water for irrigation.

Fourth—Knowing the depth of your subsoil at all points and the surface slope, the relative slope of the two is apparent.

"Fifth—To ascertain the percentage of moisture the soil holds stored in its present condition, take the samples of soil you have in the sealed glass jars from your borings. Weigh each sample separately, noting the part of the field from which it was taken, then dry each sample perfectly and weigh again. The difference is the amount of moisture in the soil, from which you ascertain the percentage of moisture in each foot of soil from the subsoil to the top.

"Sixth—The water-holding capacity of the soil may be determined by taking a box one foot square and one foot high with a fine screen for the bottom. The capacity of the box will be one cubic foot. Fill the box with soil, pour water on it with a sprinkler until the water drips off at the bottom through the screen. As soon as the dripping stops, weigh the box and contents. Then dry the earth and weigh again. The difference between the two weights gives you the amount of water the soil will hold in its water-holding capacity.

"The soil is a sponge and you can only fill the voids with water. Having learned all the conditions, you then know how much water it will require to bring about a certain percentage of moisture in the land you wish to irrigate. You know how it drains, whether it leaches down or runs off in the subsoil. You can ascertain at any time if your percentage of moisture is too low or too high, also how deep you can store water in the soil, and know how much it takes to wet it one foot down.

"Seventh—When you begin to experiment you will find that the saturating capacity of soils, even in the same field, vary greatly. When the soil is so full of water that the air is shut off, no new roots are formed, and no new water is taken up, and as a result the growth suffers. The soil requires air and sun as well as moisture.

"Shallow soils with grave or open subsoils leach the moisture rapidly and there is less danger of over-saturation, but the continual pouring of water through such soil will also carry away the fertilizing elements which are in solution and soon deplete the soil. Find out how much water your soil will hold in suspension and irrigate accordingly. The soil is a chemical laboratory and you are the chemist. The soil must have moisture, air and the heat of the sun to keep the chemical action at work making plant food. When you have too much water in the soil there is no air, hence no chemical action. With too much air there is no moisture and no chemical action. With proper moisture and cultivation the chemical action is complete, the capillary attraction bringing up the moisture from the lower levels to the top mulch. Here the sun and air manufacture the fertilizing elements and the next rain or irrigation washes them down to be taken up by the roots. The process repeats it-

self without end, so long as we water and cultivate properly.

"Cultivation is more important than irrigation, and in the arid regions one is of little use without the other. Don't overlook the fact that a weed is a pump and that it draws water out of the soil at a rapid rate. Of course it is difficult to control exactly the amount of moisture, but a great deal can be done in this direction and will amply repay any one who will take the trouble to apply his water to crops scientifically.

"The most economical method of irrigating land and at the same time one that gives the almost complete control of the water is the pipe system, delivering water under pressure to each tract of land. Pipe lines are used in California for surface and sub-irrigation systems. In some cases as high as 1000 acres of land are watered with a flow of one cubic foot per second. In Washington, under the present open ditch system of irrigation, 200 acres with this amount of water would be above the average.

"Where water is spread over the land in open ditches, the ditches should be close together and large enough to carry water in big heads. By using the large heads, you can irrigate the ground more rapidly, thus saving in the quantity of water wasted by seepage, and also have better control of the percentage of moisture you wish to put in the soil. Under long canals where there are numerous users of water, where the water is divided into several heads, the waste is very large. The soil is over-saturated and in many cases the land is ruined.

"The system of delivering water to individual users in a constant flow of small rivulets is a bad practice. The time flow system would be much better, delivering the water in large heads for short periods. Generally 60 to 70 per cent of the water diverted from streams by open canals and distributed by lateral ditches is lost before it is stored up in the soil for use by the vegetation. Water is too valuable to allow this kind of waste.

"In the inland Empire we find the amount of water used in different districts to run from one-half to four feet the acre, but why the growers use this amount of water few, if any, seem to fully understand. The fact is most people use from three to four times as much water as is necessary, and do a great deal of harm to their soil, and also to the crop by an unbusinesslike and really ignorant use of a valuable quantity. The soil is a sponge, which will only retain a certain amount of moisture. If more water is supplied it simply leaches down and is lost or runs away, carrying with it a fertilizing element of the soil which is in solution, and only those which are in solution are of any value to plant life. The principal value of water is to make the fertilizing element soluble."

WIDE DEMAND FOR OREGON APPLES

That apple growers of Oregon have nothing to fear from the danger of over-production is the statement of Wilbur K. Nowell, president of the State Board of Horticulture, who has recently returned from the East. He says the industry is not likely to be overdone and that the demand for Oregon fruits now exceeds the supply in many quarters. While away, he visited many apple-growing districts of the East. He found Oregon apples well established in Eastern markets and said the price paid for fruit from this state exceeds that given for the eastern product.

Pruning Stone Fruit Trees.

The Rogue River Fruit Grower has the following on a most important subject and it will be read with interest by many:

The best authorities all agree that all stone-fruit trees, such as peach, cherry, prune, etc., must not be pruned when the tree is in leaf for then the wounds will not readily heal and will exude gum that will bring on disease that while it may not kill the tree will weaken its vitality and bearing ability.

It has been the rule here in Rogue River valley to prune peach trees in the spring and summer and that is one of the causes for so many peach orchards being diseased and looking scraggy. The time to prune stone-fruit trees is in the fall so soon as the leaves are ripe. Then clean the trunks of rough bark and follow with a thorough spraying with bordeaux solution to kill the blight and other diseases.

Get DeWitt's Carbolized Witch Hazel Salve when you ask for it. There are a great many imitations, but there is just one original. This salve is good for anything where a salve is needed to be used, but it is especially good for Piles. Sold by all druggists.

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TERRIBLE TRAGEDY SHOCKS PORTLAND

Dr. Collins' Widow Practically Ad-
mits Fatally Shooting Her
Husband.

A dispatch from Portland tells of a terrible tragedy which took place in that city last Saturday. Dr. R. A. Miles Collins, a prominent physician was shot and instantly killed in the basement of his home. His widow is under arrest and is being closely questioned concerning the death of her husband.

With a bullet through the heart, the body was found by Dr. Friaby, who was called in by Mrs. Collins. The revolver with which the physician was killed was found on the basement floor.

"I may have killed him. I have been taking medicine that made my head reel," she declared to the police.

Collins is 34 years old and she is 13 years older. They were married a year ago and spent their honeymoon in Honolulu. After they returned they quarreled frequently on account of another woman whom Mrs. Collins imagined was trying to steal the affections of her husband. They had agreed to part that day. All the household goods were packed when Collins was killed.

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