

Pear Irrigation Studies On Soils Near Medford Analyzed by U.S. Expert

Efforts Made to Determine Conditions Of Local Soil Most Favorable To Big Yield and Quality

Ed. Note: An analysis of pear irrigation studies conducted on soils of the Medford region was given by Arch Work, assistant irrigation engineer of the U. S. department of agriculture, at the January 28 meeting of the Fruit Growers League of Jackson county. The analysis, with accompanying charts, will be published in the Mail Tribune, the first installment appearing herewith.

By ARCH WORK
Assistant Irrigation Engineer, Division of Irrigation, Bureau of Agricultural Engineering, United States Department of Agriculture.

At the annual meeting of the league last year, the background of the irrigation investigation underway at Medford was presented and there seems to be no need for repeating that discussion. Briefly, the purpose of the work is to find the condition, or conditions, of soil moisture which are most favorable to consistently increasing production of fruit of excellent keeping and dessert quality, at lowest unit cost.

The object of irrigation is to maintain in the soil a favorable condition of soil moisture. The results of favorable conditions of soil moisture, other things being equal, are manifested in large, thrifty and vigorous trees, and high production per tree of fruit of good quality with a consequent decreased cost of production per box. If the result of any particular condition of soil moisture is favorable we may reasonably assume that the condition itself is favorable.

The Medford investigations have shown certain soil moisture conditions to be favorable to increased yields of fruit, and increased vigor and growth of trees. The purpose of my talk is to analyze this term "favorable soil moisture conditions" in order that we may see what these conditions are and how we may secure them in our orchards.

We might first briefly summarize the general conception of soil moisture. Various generally recognized forms of soil moisture are illustrated in Fig. 1.

Field capacity refers to the maximum percentage of water retained in the soil after gravitational water from rain or irrigation has had an opportunity to drain out of the soil. It is recognized from results at Medford, as well as elsewhere, that slow downward percolation takes place for weeks after rainfall or irrigation has brought soil moisture to the saturation point. However, a point is reached from 72 to 120 hours subsequent to irrigation after which the downward movement of water becomes very slow. This point of approximate stability is, for all practical purposes, the "field capacity." When the soil contains more than this quantity of water it is too wet.

Wilting Point is the moisture content present in the soil when plants will even if the air is saturated with moisture. Below this point plants cannot extract water sufficiently fast to sustain growth. When the soil contains less than this amount of water it is much too dry.

Available Moisture Capacity is the moisture content found in soils between the field capacity and the wilting point. It is in this range that the roots of our pear and apple trees grow and take up water and mineral matter from the soil for transmission to the leaves. Growth of most plants occurs only in this range of available moisture.

In our experimental work during the last three years on the Chester Fitch and Klamath orchards we have had two chief questions in mind:

1. How much water need be added to the soil to produce maximum crops of high quality at the low unit cost year after year?
2. At what periods in the annual cycle of the tree and the fruit should water be applied?

The same experiments were carried on in each of the two orchards. The variety at the Fitch orchard is Bartlett and at the Klamath is D'Anjou. The soil type at Fitch's is Meyer silt clay loam with a field capacity of approximately 27 per cent of the dry weight of the soil. The soil type at Klamath is Meyer clay adobe with a field capacity of approximately 30 per cent. The average soil depth in both orchards is about 4 1/2 feet. Four plots at Fitch's and four plots at Klamath were selected. The soil moisture content of each plot has been followed for three seasons. Different quantities of water were applied at different times and the effect on tree vigor and growth, yield and size of fruit observed, as well as on bloom and set the following year.

In one plot in each orchard, the average soil moisture content in the upper three feet was allowed to drop one-fifth of the way from the field capacity to the wilting point before irrigation was applied. These frequently irrigated plots each received from five to six irrigations yearly. On one plot in each orchard the average soil moisture content in the upper three feet was allowed to drop four-fifths of the way from the field capacity to the wilting point before irrigation water was applied. These plots received one irrigation each year. The fourth plot in each orchard received the same irrigation treatment as the portion of the orchard not included in the experiment, hence was not irrigated at any set time. These plots received from one to three irrigations annually.

Neither number of irrigations depth of application nor both combined is an altogether accurate means of comparing soil moisture conditions in plots. The soil moisture content itself, expressed in standard terms, is the most accurate means of comparison, and the one that will be used most frequently in this discussion.

Samples of each foot of depth from the bottom of the mulch to bedrock, for soil moisture determinations, were taken at frequent intervals at representative locations in each plot. A very complete and detailed story of soil moisture conditions was secured for the three year period.

Investigations on these orchards and on the Medford Experiment station have led us to conclude that in shallow soils approximately 37 per cent of the fine fibrous roots which extract moisture from the soil are located in the first foot below the mulch, 32 per cent in the second foot, 20 per cent in the third foot and 11 per cent in the fourth foot. Almost 70 per cent in the upper three feet. In view of these facts we are justified in using the average moisture content in the upper three feet as a measure of moisture conditions in the root zone. On deeper soils not as large a percentage of the total roots are found in the upper two or three feet.

The root concentration, or number of active rootlets per cubic foot of rooting space is about the same at all distances from the tree. This indicates that in a mature orchard the entire soil mass should be uniformly wetted by each irrigation.

On the Medford Experiment station in 1932 four different irrigation treatments were tried on four plots of about 1/2 acre each. The plots were treated uniformly in all respects other than irrigation. The soil type is Meyer clay adobe with an average field capacity of about 32 per cent for the upper three feet.

On one plot an effort was made to keep the soil moisture up to or above 80 per cent of the available moisture capacity in the upper three feet, from full bloom to picking. Conditions on this plot approximated conditions on commercial orchards with an unlimited water supply. This plot received seven irrigations, throughout the period from full bloom to harvest.

In another plot the moisture content in the upper three feet was allowed to drop almost to the wilting point before irrigating. The condition on this plot approximated local conditions in the years when water supply has been a limiting factor in production, and only one irrigation has been available.

In a third plot the moisture content of the upper three feet was kept at or above 80 per cent of the available moisture capacity until about 85 days prior to harvest and then no further water was applied. This condition approximated commercial practice here when flood water is applied in the spring and storage water is used up by late June or early July. This plot received four early irrigations.

In the last plot of the four, the moisture content of the upper three feet of soil was held at or above 80 per cent of the available moisture capacity in the 45 days immediately prior to picking. The early season moisture was the stored 1 1/2 inch of winter and spring rains. The moisture in this plot did not go below 70 per cent of the maximum available until June 1, due to these spring rains. This is the condition that would be secured here on a commercial scale by withholding a limited storage supply until July 15 or thereabouts. This plot received three late irrigations.

Some years ago the idea was quite prevalent that soils had an "optimum moisture content"; that is, a particular moisture content, or relatively narrow range of soil moisture at which plant growth took place most readily. Some investigations in recent years have accumulated data, which has been interpreted to modify this idea. This is notably true in California where Velmeyer and Hendrickson of the California Experiment station working with several deciduous fruits other than pears, and on light soils have come to the conclusion that as long as soil moisture is above the wilting point it is as readily available to plants in one portion of the available range as in any other portion. Their "optimum" range is then the entire range of available moisture as shown in Fig. 1. Their conclusion is that soil moisture either IS or IS NOT readily available.

The results at Medford on heavy clay soils do not bear out this conclusion.

Portland, Oregon—
"I had pains and aches in my back across my kidneys, swelling of fingers and feet, and frequent rising at night," wrote Mrs. C. Deek, number of 6330-83rd St. S. E., "but after I had taken part of a bottle of Dr. Pierce's A-nuric Tablets all this trouble was corrected and I have never noticed any of it since."
Sold by druggists everywhere.
Send 10c to Dr. Pierce's Clinic, Buffalo, N. Y., for a trial package of A-nuric and write for free medical advice.

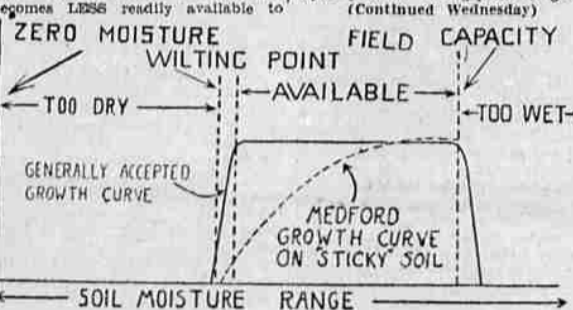
Severin Battery Service
Medford Made Batteries
6-volt, 18-plate, 1 year guarantee. \$3.20
Re-wound Armatures \$1 up
Recharge 50c. Our Make 25c
1312 N. Riverside Phone 290

EX-CHAMPS IN BILLIARD TOURNAY



Johnny Layton (left) of Sedalia, Mo., and Otto Reisel of Philadelphia, former champions, were among the competitors in the world's three-cushion championship play in Chicago. (Associated Press Photo.)

culuation, evidence secured to date in our investigations on all three orchards indicates that soil moisture becomes LESS readily available to



Medford Growth Curve on Sticky Soil

**U. P. SUBSIDIARIES
MAY JOIN PARENT
IN ECONOMY MOVE**

WASHINGTON, Jan. 31.—(AP)—The Union Pacific Railroad company today was authorized by the interstate commerce commission to bring its subsidiary lines fully into the Union Pacific system.

The commission attached a condition that the company agree to purchase certain short lines at such a time as the commission may order.

The opinion of the commission would authorize the Union Pacific to bring under one accounting system the Oregon Short Line railroad company, the Oregon-Washington Railroad and Navigation company, the Los Angeles and Salt Lake Railroad company and the St. Joseph and Grand Island railway company.

There will be no change in operating conditions, the only new arrangement being consolidation of the accounting systems of the four subsidiaries with the accounting of the parent company.

Approximately half of the employees of the accounting departments of the subsidiaries will be absorbed into the Union Pacific accounting department, the commission saying that seniority rights would be observed.

to CHICAGO through CALIFORNIA

\$40



Southern Pacific

J. C. CARRE, Agent, Phone 34

**When in HOLLYWOOD
Live at the lovely
HOTEL
CHRISTIE**

Rooms without bath \$1.50 up
Rooms with bath . . . \$2.00 up
Special weekly & monthly rates.
Golf Privileges, Garage adjacent.
Cars checked at the door.

IN THE heart of everything. Smart shops, unique theatres. Rub elbows with world famous movie stars. Twenty minutes from the ocean. Downtown Los Angeles twenty-five minutes. Sumptuous . . . luxurious Hotel Christie, beautiful Hollywood.

HOTEL CHRISTIE 6724 Hollywood Blvd.
Hollywood, California
R. J. MATHESON, Manager

SCHOOL DISTRICT CONSOLIDATION IS HOUSE BILL AIM

City, Town and County Districts Provided in Proposed Measure—Voters' O. K. Would Be Necessary

SALEM, Jan. 31.—(AP)—Changes in the present school law and provision for three kinds of districts with an amendment cutting out town school districts are features of a bill received by the house today.

The bill bears the names of Representatives Stockdale, Semon, Cooter, Sinder and Senators Upton and Jones. In addition to changes in the law two new sections are added.

The bill provides for three kinds of school districts within a county—city, town and county school districts—an amendment cutting out town school districts and then proceeding to unite all other than city school districts and the county districts.

The election shall be called by the district boundary board or upon petition of 100 legal voters. No special election shall be held within 60 days prior to the annual meeting.

Provision is made that a statewide election shall be held on the day of the annual school meeting in 1934, in all counties to determine the question of consolidation. A comprehensive plan of equalizing indebtedness, assets and liabilities is contemplated. Appraisers shall be named

by the county school board, and approved by the state board of education and the valuations be for school purposes only. Findings may be modified by the school board. Hearings and appeals are also provided.

Five Directors Plan.
In the event that the assets of a district are greater than its liabilities the taxation for school purposes on the property within the district shall be reduced by that amount over a 15-year period, and where the liabilities are greater than the assets a special tax shall be levied for a similar period. Five directors are elected for five years each.

When a city district seeks to consolidate with a county district it is necessary to have a majority vote of both districts, after both boards have agreed upon an adjustment of assets and liabilities. The city continues to remain a sub-district. The act does not apply to union high school districts which contain the city school district or to one high school district which includes territory in more than one county.

Another school bill, by Representatives Coates and Senator Upton amends the code relating to the duties of district school boards, and among other things provides that the board shall fix the salaries of superintendents. The amendment provides that in any county under 5000 population which has adopted the county unit plan, the salary shall not exceed \$1800 a year.

BIRTHS

Born to Mr. and Mrs. Willard O. Vincent of Lozier Lane, a girl weighing 5 pounds Sunday, Jan. 29.

For immediate clearance hats formerly priced up to \$10.00 now \$5e and \$1.00.

ETHELWYN B. HOPPMANN.
New spring shoes now on display. A larger and smarter variety than we have ever had, and at only \$1.95 to \$3.95. The Band Box and Shoe Box.

HARR FOR DEBATE WITH BILLY CARL THRU NEWSPAPER

To the Editor:

I regret to seem slow in replying to "Farmer Bill's" communication of January 25, dealing with our contemplated battle. For fear this may appear as a sign of weakening I must explain that we are not as yet pleased with a daily mail service, hence the unavoidable delay.

I am only glad to have an opportunity to defend the cause of justice against one who has so boldly misconstrued our unselfish motives. But it seems it should not be necessary for a raw "hill billy" so lacking in technical ability to have to assume this responsibility. Nevertheless, I go forth armed with courage, knowing that "right is might."

The exigencies of my profession render it impossible for me to meet my adversary face to face and am

a little reluctant about venturing out after dark until law and order are re-established in Jackson county. Like the darky constable, I am "brave but cautious." I suggest if the Tribune will permit, that we settle this question through the columns of their paper. I assure them we will be as decorous as this noble cause will justify. Though my opponent should become rampant when he senses certain defeat, I will quickly slip one of my verbal pea butter restrictor holds on him and he will be as helpless as a farmer trying to sell lamb on the local market.

Awaiting the onslaught of the enemy, I am very truly,
BERT HARR.

Gold Relief QUICK!
Start taking Liquocold at the first sneeze or sniffle. Relief comes quickly. Many say in 30 minutes, Liquocold is the popular new liquid cold prescription. Get a bottle today—have it on hand. Jarmin & Woods Drug Store.
LIQUOCOLD

Save 25% On Your FIRE INSURANCE Cost
Oregon Mutual policies are NON-ASSESSABLE. Oregon Mutual maintains more than twice the surplus required by Oregon Insurance Laws.
Oregon Mutual Fire Insurance Co.
C. L. GOFF NEW LOCATION
16 NO. RIVERSIDE

For Street
For Work
For Dress
For Play

FIRST BIG SALE OF THE SEASON

Just the Dress for Early Spring Wear

New SPRING DRESSES

AT MANN'S WEDNESDAY \$3.95

Come as Early as You Can Wednesday Morning See What's New in Dresses for Spring

Sale of Spring Silks

Wednesday at Mann's

A sale Wednesday of beautiful new spring silks that certainly will prove an inspiration to the women of Medford who make their own frocks.

New E-Sharpe Printed Crepes \$1.49
Fashion magazines for Spring 1933 will tell you they are going to wear this smart silk in a number of ways. E-Sharp Printed Crepe is now available in the newest colors and patterns and priced to meet the demand for quality at a low cost. Per yard, at Mann's.

New Furobeau 36-inch Rough Crepes 89c
Furobeau crepe, a new 1933 silk that features the rough weave that will be so popular this season. Women will adore its cheery spring shades. . . and it is washable . . . yet the cost of this charming crepe is only 89c yard. So why not a new frock at once.

MAIN FLOOR **Mann's Department Store** MAIN FLOOR

Colonial Dames
Demonstration and Free Facial
A staff specialist from the Colonial Dames Laboratories in Hollywood is now in our toiletries section. She is here to advise you and prescribe the care best suited to develop your particular type of beauty. She will also give you a free facial if you make your reservation at once. Facials to private. Toiletries section.
Mann's Main Aisle