

Irrigation and Drainage Letter

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IRRIGATION AND DRAINAGE SHORT COURSES

Several short courses for farmers and agriculturists were held during the past winter and spring. These consisted of one or two, two-hour evening sessions a week for a period of six to eight weeks. The subjects covered were:

- (1) Water in the Soil
- (2) Plant-Water Relations
- (3) Water Supply and Distribution
- (4) Methods of Irrigation
- (5) Land Preparation for Irrigation
- (6) Drainage
- (7) Water Quality and Penetration
- (8) Final summary Session with panel of speakers.

We felt these courses were successful and well received but if you want an unbiased opinion, we suggest you check with:

Jack Underhill or Jewell Meyer concerning the meetings in Stockton; George Ferry or John Hoyt for Bakersfield; A.F. Van Maren for Indio; Otis Harvey for Riverside; Sid Kite for Hanford.

CANAL SAFETY BOOKLET

A new booklet, Canal Safety has been published by the Bureau of Reclamation as an additional measure to protect the public, operating personnel, and animal life, from the hazards of canals and other water-carrying structures. Copies of the booklet may be obtained by writing to any Bureau of Reclamation field office. The local regional office is in Sacramento.

IRRIGATION FIELD TRAINING CONFERENCE

This session is for farm advisors (and specialists if they desire) and is to be held at Davis, June 16,17,18 and the morning of the 19th.

This is not a series of lectures.

We are going to irrigate and collect data which will allow us to analyze the irrigation systems and recommend any changes necessary to improve the systems.

We will irrigate strips of alfalfa, row crops, and sprinkler irrigated pasture. We will measure the water through several types of measuring devices.

We will time the advance of the water down the field.

We will measure the infiltration rate into the soil.

We will measure the pressure on the sprinkler lines and the discharge from the system.

This means you should bring rubber boots or overshoes, a shovel, and a clipboard.

This session will be similar to those held at Davis and Meloland Station in 1956, only better.

We will meet in the Irrigation Department field house on the Campbell Tract at 9:00 a.m. Tuesday, June 16 for a short orientation on what we will be doing for the next three days.

Your instructors will be your Irrigation Specialists and Experiment Station people. Rooms are available in the dormitories and meals can be taken on the campus.

In order that we can reserve rooms and send you preliminary information, it will be appreciated if those who know they are going to attend advise Clyde Houston as soon as possible. Also if there are any questions, don't hesitate to write him.

WITH THIS ISSUE

Periodically we run into failure in drain tile. The type of failure referred to is

Houston - Marsh - Booher

structural failure in the tile itself. Dr. J. N. Luthin has prepared the attached especially for our letter. Read it for it may answer some of the questions sometimes confronting you. Then file it in 12.21.

DROUGHT - 1959

You are all aware of the shortage or expected shortage of water this season. Some of you have held meetings and issued publications. Jewell Meyer and Gene Stevenson in Stanislaus County have put out a very good short mimeograph. I'm sure they will send you a copy if you'll write them. Another source of material that you all have is Veihmeyer and Hendrickson's article, "Irrigation During a Rainfall-Deficient Year." This is found in California Agriculture, Page 3, Volume 2, No. 3, March 1948.

Quality of Concrete Drain Tile

by

James N. Luthin

Concrete products are exposed in service to a wide range of conditions. The conditions may range all the way from highly favorable to extremely severe - sometimes in the same drainage system. Therefore, drain tile of good quality should always be installed when long, satisfactory service is desired.

The American Society for Testing Materials has adopted standard specifications for tile. The principal requirements of these specifications are for adequate crushing strength and water absorption limits. There are two classes of drain tile designated; the standard and extra quality. Drain tiles meeting these requirements are not necessarily safe against cracking in ditches which are wider or deeper than the ordinary.

There are certain manufacturing procedures which must be followed in order that the required strength of the tile be attained. The first of these is that a well-graded sound aggregate and sufficient cement be used in the manufacture of the tile. Secondly, there must be a maximum of mixing water. Thirdly, ample compaction of the material is required; and fourth, the tile must be cured adequately. In addition to these the tile manufacturers must take special measures to produce tile that will last in soils of high acidity or high sulfate content.

The aggregate must have a high proportion of coarse particles in the mix to produce drain tile which will be low enough in absorption to meet the requirements.

The temptation in making dry tamped concrete products where the jackets or forms are stripped immediately is to not use enough water in the mix so that the products will have no tendency to stick to the jackets or slump out of shape when the jackets are removed. However, making dry tamped concrete drain tile with too little water in the mix means making products whose quality will be lower than the richness of the mixes makes possible.

When the mix is too dry, the tile surface on the outside will be relatively smooth. Maximum quality is indicated when this outer surface has a stippled appearance caused by a water mix sticking to the jacket when it is removed.

Careful proportioning of the aggregates, cement and water, does not insure high strength and low absorption drain tile unless the resulting stiff mix is thoroughly compacted when formed into the tile. The modern packer-head machines used for making tile will provide adequate compaction for the material if they are properly operated.

All concrete drain tile should be moist-cured in accordance with good practices so that previous to the installation they will meet the ASTM strength and absorption requirements. There are two methods for moist-curing drain tile; one is by water spray or fog at the prevailing temperatures and the other is by the use of saturated steam at temperatures between 100 and 190°F. If steam is used at about 155° the curing can be a relatively short duration. However, if the tile is sprinkled by hand or by an automatic sprinkler system, the time required for full setting of the concrete is about one month.

There are certain soil conditions which require specially made tile. Where the soil is high in acidity, the tile should be at least of extra quality. Where the soil is high in sulfates, that is, containing over 3,000 parts per million of sodium or magnesium sulfate, then special precautions must be taken. A special cement known as type 2 cement can be used where there is moderate sulfate present. Type 4 and 5 cements are used where high sulfate resistance is required. Since type 2 cement is commonly available on the open market, it is the one which is usually used to produce a sulfate resistant product of a high order.