California Avocado Society 1951 Yearbook 36: 89-90

A SOIL MAP FOR BETTER SOIL MANAGEMENT

Elwood E. Trask
President of the California Avocado Society, and an agricultural consultant.

With all commercial tree crops, the development of the root system is the key to the size, vigor, and longevity of the tree. Where there is limited root development, there is corresponding limited top growth. Therefore the management of the soil in which the roots grow may be considered the keystone of grove success.

The major difficulty involved in soil management is the fact that there is no simple, practical method of examining the tree roots to determine the general condition and extent of root development. There is, however, a comparatively simple means of improving the knowledge of the grove soil and thereby gaining a better understanding of probable root development, and an understanding of the results that may be expected from various soil management practices.

In most of our avocado groves on hill lands, the soils are generally shallow, and often not over two feet to decomposed granite, shale, or clay material where drainage is retarded, or perhaps materially impaired. To determine the rapidity of drainage, a hole can be bored or dug into the subsoil or parent material and filled with water and allowed to stand until drained away. When, at the time of the test, the subsoil is moist, drainage should be complete in six hours or less to be considered as having reasonably good drainage under most conditions. Where there is a sharp demarcation of color and/or texture between soil and subsoil, there is probably a change in the rate of drainage, which may be so pronounced as to cause a saturated condition of the surface soil, with resultant lateral movement of moisture over the top of the subsoil and accumulation of water in low areas. An accumulation of soil water in low areas from one irrigation to the next, or from frequent heavy rains, can cause root damage; and, with the presence of the cinnamon fungus or other diabolical soil organisms, an area of decline may develop which could spread to a large portion of the grove.

If the trees are planted, soil borings can be made at alternate trees in alternate rows; or with unplanted orchard land, borings can be made at forty or fifty foot intervals. These borings should be recorded so they can be placed directly on the soil map. Information from the borings should include: 1) depth of surface soil; 2) depth of subsoil; 3) depth of hard compact or impervious clay layer, or depth to sand, or bedrock materials such as decomposed granite, shale, or schist rock.

The results of the soil borings should be charted on the map according to location in the grove or unplanted area. When all borings have been charted, lines can be drawn about the areas of similar soil condition, and colored crayon or ink used to mark out each area and type. With the soil map as a guide, the orchardist can adjust his irrigation practices to meet the requirements of each particular soil type, both as to frequency and quantity

per application. Also surface run-off furrows can be so placed as to prevent excess rainwater moving from shallow to deeper soils and possibly causing a waterlogged condition on the deeper soils.

On deeper hillside soils the soil moisture conditions should be checked to six feet before starting the first spring irrigation. And a follow up during the irrigation season with a check on the penetration of irrigation application should prevent excess irrigation and possible drainage troubles. In years of subnormal rainfall, the deep check will indicate when leaching irrigation can be applied to best advantage.