

thread-like fibers (rhizomorphs) from tree to tree. It presumably originates in areas where oak roots have decayed. Therefore, such areas if known, should be avoided or planted to a resistant tree. There is no known method of control. Surgery may be practiced on a tree if not too far gone. Isolating the diseased trees by digging trenches or constructing underground barriers around the infected area may be suggested but this seems to be impractical in most cases. The California black walnut (*Juglans californica hindsii*), the fig (*Ficus carica*) and the French pear (*Pyrus communis*) roots seem to be three species which are resistant to this disease and are used in replanting in oak root infected spots.<sup>21</sup>

**Sour Sap.**—Sour sap is a general term applied to a trouble that is, so far as known, not caused by a definite parasite, although some forms may be due to specific organisms. The ordinary forms of sour sap are associated with extreme variations in soil moisture and temperature. It seems to appear on hardpan soils or during periods of surplus water in the soil. Good drainage is essential. A furrow may be dug in early winter on either side of the tree row to provide surface drainage and prevent the soil from remaining saturated for long periods. In certain cases where injury has been noted from a temporary high water table, which has later subsided, recovery has been aided by removal of soil from around the trunk and main roots so as to expose them to air.

**Die-Back, Gummy, Yellows, and Split Pit.**—These are abnormalities, the causes of which are not as yet known. Most of these troubles seem to be related to abnormal soil conditions. Trees standing over old barnyards or on hardpan soils, or under conditions of irregular soil moisture are likely to show some of these troubles. The most promising methods of treatment are to increase the humus content of the soil by means of green manure crops, to break up the hardpan and to irrigate so as to insure a uniform moisture condition in the soil to a depth of several feet. Where these troubles are serious and persistent it may be better to grow some other crop.

#### THE CONTROL OF INSECTS AND OTHER PESTS

The insects may be placed in two groups, namely, chewing and sucking insects. Chewing insects remove and swallow parts of the plant surfaces. Such insects are controlled by the application of stomach poisons. On the other hand, the sucking insects withdraw the plant

<sup>21</sup> Hendrickson, A. H. Oak fungus in orchard trees. California Agr. Exp. Sta. Cir. 289:1-13. 1925.