

GARDEN & ORCHARD.

Citrus Industry in California.—IV.
GENERAL CULTURAL AND PACKING-HOUSE
METHODS.

By W. R. Dewar.

I have said in a previous article I thought the citrus growers could teach the deciduous fruit-growers points on the general cultural methods employed in their groves; also in packing-house management. This is because they have brought both nearly to the highest state of efficiency possible under present-day knowledge. There are backward growers here as elsewhere, but such are the exception rather than the rule. One eminent horticultural writer has recently said that there are few parts of the world where horticulture has been more highly developed, entered more widely into commerce, and contributed to the welfare of a greater number of people than in Italy and Sicily. He must have had in mind Southern California citrus districts when he excepted a few parts of the world from a general statement.

The citrus groves are variable in size, ranging in general from 5 to 10 acres for smaller holders, to 25 to 50 acres for larger holders. Some companies own from 100 up to 500 acres; a few others a thousand or so acres; and one company, probably the largest in California, owns or operates about 4,000 acres. This latter is a tremendous undertaking, and requires considerable skill in management. It was with this company that the writer spent five months working in their packing-houses and studying the industry as a whole.

Suitable land for orange culture can be secured at from \$200 to \$1,000 per acre, the range depending on several factors, such as freedom from frosts and winds, availability of water for irrigation, inherent qualities of the soil and sub-soil, packing-houses and transportation facilities, congenial locality for a home, and so on. When the groves are in full bearing the price will range from \$500 to \$2,000 per acre, depending also on many factors. Lemon groves are not on the market at present, except at exorbitant prices; this owing to the exceptional prices ruling during the last few years for lemons. Trees are planted 20 to 25 ft. apart. They should begin to crop about the fourth year, give good returns in six years, and come into full bearing in about ten years. It is difficult to say what the net returns per acre usually are or should be. Roughly, if a person pays \$250 per acre for the bare land, his expenses per acre for developing will increase this amount to about \$700 at the end of six years, and to \$1,000 or more at the end of ten years, when the grove is supposed to be in full bearing. During this past season certain very excellent groves have yielded from 700 to 760 picking boxes per acre. Counting 70 trees per acre, this would average 10 boxes per tree. Most groves, I think, will come away under this average, running at 2 to 5 boxes per tree. The net returns from a well-kept orange grove should run from \$100 to \$500 per acre, according to most reports. Actually they do not. The President of the California Fruit-growers' Exchange states that one-third of the orange groves are run at a loss, one-third break even, and one-third produce from a fair to a good profit. It is obvious, then, that the orange industry is not such a lucrative business as it was a few years ago, when \$2,000 was considered a very fair profit per acre. The lemon is the aristocrat at present, and is proving so profitable that a prospective buyer may scan the California daily papers in vain for lemon groves offered for sale, whilst he loses himself in a maze of veritable fortunes awaiting his grasp in orange groves.

In the groves practical completeness in all operations is the first important phase. Begin-

ning with the laying out of a new grove and following through the operations of cultivation, pruning, fertilizing, irrigation, fumigation and picking, everything is done with an effort to get as near perfection as possible. It has been found that this can be best attained by employing capable, experienced and energetic foremen. For labor is of many nationalities. There is the industrious little Jap—industrious so long as you watch him closely, for even he will "slink" work—there is the lazy Mexican, always requiring urging on; there is the garrulous Italian, much given to singing famous operas as he works; the shuffling Chinaman, over-anxious to smoke; the American, Englishman, Swede, Canadian, who all improve under a good "boss." With such mixed material, to get best results, a capable foreman is invaluable. In cases of small groves, the owner often acts as his own foreman, and his profits will depend a great deal on his ability to manage these different classes of men. Completeness in some operations is necessary for success in others. For instance, ground intended for a new grove must be well laid out and levelled so

or September; that cover crops, especially winter vetch, Canada peas and burr clover, are coming into general use as a winter covering and as a means of improving the condition of the soil. So much for the completeness of operations in the groves.

The same factor of thoroughness is noticeable in the packing-houses, but one probably of still greater importance here is the great care exercised in handling the fruit. Lemons are handled "like eggs," because the least bruise is likely to break some oil-cells in the rind, and thus make an opening for the entrance of "blue-mold" spores. This "blue mold" decay is the bane of all lemon shippers. So if the foreman happens not to be in good humor and a workman wishes to hear him "cuss" a little, let him drop a box of lemons; or, better still, accidentally turn over a truckload of six boxes. What might be said is not a fit subject for print. All workmen who handle the fruit in any way must wear thin canvas gloves, which are supplied by the packing-house. This is to prevent finger-nail injury. Anyone who has tried

knows very well how easy it is to scoop out little chunks of peel when handling oranges or lemons with the bare hands. Field picking-boxes are carefully examined every time they go through the house, and any broken ones, or any with intruding nails, are thrown aside to be mended before being used again. Great care is required in every operation, and the foreman is always wandering around with sharp eyes, ready to pounce upon the first unfortunate who handles the fruit with unnecessary roughness. If he is caught twice, he will very likely get his "time." I have seen rough workmen last but

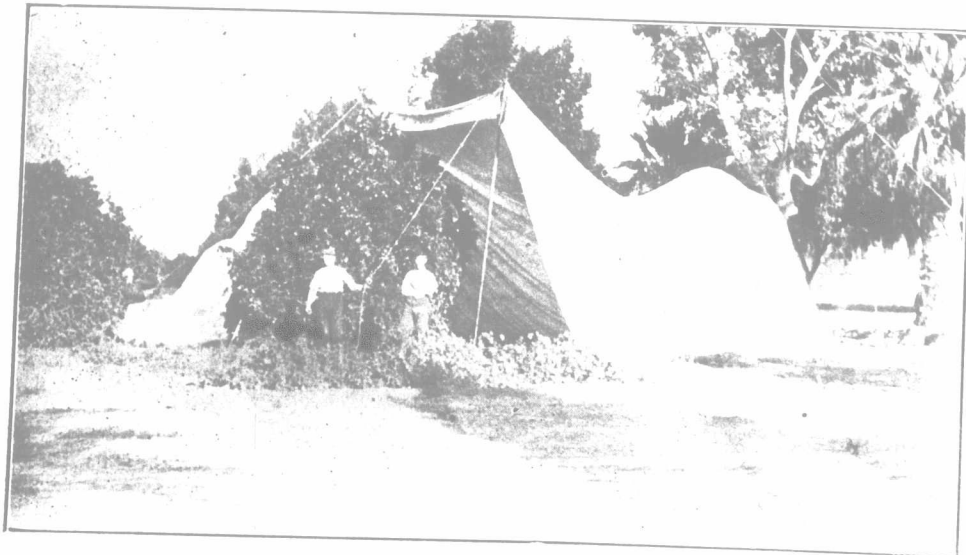


An Irrigation Canal.

that irrigation may be successfully performed later. Contours must be such that the water will not run too fast in the furrows, for the water is meant to soak into the soil and not simply to run down a hill. Perfection and economy are especially important in this case, as water is the most expensive factor in citrus culture. In other operations thoroughness is absolutely necessary or the money expended is entirely wasted. This is so in fumigation for scale insects with which citrus trees become badly infested. Gangs of four men each are kept busy a big part of the year fumigating scale-infested trees. This is accomplished by covering the tree with a specially-constructed tent, inside of which hydrocyanic acid gas is generated. An underdose is not effective; an overdose will burn the trees; consequently the fumigation supervisor must be active and intelligent to see that the work is carefully and thoroughly done. The principles of fertilizing and of cultivation for the conservation of moisture and liberation of plant food are thoroughly understood. G. Harold Powell, late of the U. S. Department of Agriculture, says that "commercial fertilizers of various kinds are probably used more extensively in Southern California than in any other orchard industry in the country, except in citrus fruit-growing in Florida." The same writer says that "in a general way tillage is frequent and thorough during the season from March to August

one day in a packing-house. The same care must be exercised in picking, and a foreman is placed over every gang of thirty pickers. Each orange or lemon is clipped from the tree by means of specially-constructed clippers, a second clip is made to shorten the stem so that it will not injure other fruit with which it comes in contact, and then it is placed in a stout canvas picking-sack, which is hung over the shoulder and neck and suspended in front or at the side, whichever the picker finds more convenient. When full these sacks are emptied into field or "lug" boxes in which the fruit is drawn to the packing-houses. Every operation is watched by foremen to see that no unnecessary roughness is used in handling the fruit from the time it is picked until it is loaded in the cars ready for shipment.

Another important factor which has done much to establish the reputation of this great citrus industry is the standardization of sizes, grades and shipping boxes. This is more perfectly developed with oranges than with lemons, because their regular shape and the demands of the Eastern trade make it possible and necessary. There is only one size orange box—the standard, 12"x12"x26" outside measurement—if we except the half-boxes, which are mainly used for packing tangerines. There are the regular grades into extra fancy, fancy, extra choice, choice, and standard. There are the regular packs, which are used according to

Orange Tree Fumigation.
Pulling the tents over the tree.Orange Grove, with Nursery Stock Interplanted.
Residence surrounded by Australian "gum" trees (Eucalyptus).