

Each female of the over-wintering generation is capable, under favourable conditions, of producing approximately one hundred young. In the course of but one month these reach maturity and the females begin to produce another generation. There are thus produced some four or five generations during the entire season. Under supposedly favourable conditions, single females of the later generations have been observed to produce approximately 600 young. Basing their estimates upon breeding-cage observations, Dr. Howard and Mr. Pergande have shown that it would be possible, under the most favourable conditions, for the progeny of a single female to reach the astonishing number of 3,216,080,400 individuals in a single season. Should each of these scales reach the largest size, one-tenth of an inch, and were they all placed side by side touching each other in all directions, there would be enough of them to cover, approximately, five acres of surface. It is almost needless to add that in the intense struggle for existence of organism with organism, and with climate conditions, such an astonishing rate of multiplication is not even approximated under natural conditions. Nevertheless, when one realises the enormous rapidity with which this pest multiplies, it is no longer a surprise that *careless* work in spraying falls to give satisfactory results. A few females here and there, upon very small portions of the tree which have not been reached by the spray, may, during a single season, completely re-infest that tree. Satisfactory results are obtained only by the most thorough work. Every square inch of surface of trunk, limbs, branches and twigs should be thoroughly covered. By far the most common cause of unsatisfactory results is the failure of those who spray to do thorough work.

How the San Jose Scale Spreads.

Since the female scale is motionless, and permanently attached throughout life to the branch on which it feeds, it is often asked how it is that the San Jose Scale can spread from tree to tree, orchard to orchard, and even for greater distances? It is only during the first few hours of its existence that one of these little pests can emigrate, and observation has shown that, even then, it is incapable by its own efforts of getting more than a few feet at most from the tree on which it was born. But birds and bees and other insects make good air-ships for the little creatures, and no doubt many a young scale has crawled upon the foot of a bird or upon some larger insect and thereon voyaged to the distant realm of another tree or orchard. No doubt, also, strong gusts of wind often tear them loose from the bark on which they are crawling and waft them to the branches of neighboring trees. These are provisions of nature for distributing the species. Through the channels of trade they are carried long distances, even from continent to continent, upon infested nursery stock, cuttings, etc., and probably to a lesser extent upon infested fruit. Buds and scions carelessly taken from an infested tree may transmit the pest to the orchard in which they are placed, or may infest an entire block of trees in some nursery, and thence be distributed to many orchards. It is also probable that many are carried about upon the hands and clothes of the men who prune the trees or pick the fruit or otherwise work about the orchards.—*Oregon Bulletin* No. 88; Cordley.