

properly and hence may be injured by very cold weather. Killing back and bark splitting may be induced by late cultivation. I do not wish to depreciate the value of orchard cultivation by any means, as I think that judicious cultivation will produce good results, but I do think, however, a mistake has been made by cultivating too late in the season. Plowing the soil away from the base of the trees late in the Fall is not advisable as it may pre-dispose the trees to collar rot. If fall plowing is done do not plow the soil away, close up to the trees. If the orchard is plowed in the fall, plow so that the soil is thrown toward the trees, not away from it.

4. POOR SOIL DRAINAGE.

Trees on poorly drained soils were invariably injured more than those on well drained soils. This fact was noticeable in all sections but especially so in the peach growing areas.

5. LACK OF SOIL FERTILITY.

Bearing trees growing on soils deficient in fertility were more severely injured than those growing on moderately fertile soils. Of course it is possible to make some soils too rich especially in nitrogen, but this seldom occurs. My own observations and the observations of others who have studied winter injury justify me in stating that many of our bearing fruit trees are pre-disposed to winter killing by lack of food.

6. HEAVY PRODUCTION OF FRUIT DURING PRECEDING SEASON.

Trees which bore a heavy crop of fruit in 1917 were more severely damaged than trees of the same variety or of the same hardiness which bore a light crop or no fruit during 1917. In Prince Edward County the writer saw what appeared to be an example of the relationship of heavy fruiting to Winter Injury.

A Pewaukee tree had the unusual habit of producing a crop of fruit on a central leader branch in one year and the next year the lower lateral branches bore fruit. On this tree the central leader limb bore no fruit in 1917 and in consequence thereof appeared to be quite healthy while the lower lateral branches which bore a heavy crop in 1917 were nearly all dead. In Northumberland County a Northern Spy orchard, which bore a heavy crop of fruit in 1917, was badly injured during last winter, while another Spy orchard nearby on practically the same kind of soil escaped almost uninjured, due largely to that fact that but little fruit was produced in 1917. Prof. Macoun of the Central Experimental Farm gives some interesting data on this question. Accurate records kept annually for twenty years show that the heavy bearing trees are much more susceptible to winter killing than those which produce a light yield or no fruit at all.

7. INSECT PESTS AND PLANT DISEASES.

Insect pests and plant diseases which attack the foliage of fruit trees often weaken the trees considerably by interfering with the growth processes, which are necessary for the proper maturity of wood and thus pre-dispose the trees to winter injury.

HOW CAN WE PREVENT A RECURRENCE OF THESE LOSSES?

1. PLANT BREEDING.

Fruit Growers everywhere are asking the question,—What can we do to prevent a recurrence of the losses of the past winter. This problem is not easy to solve as we have no reasonable assurance that similar climatic conditions may not return and cause further losses. Until we can produce by plant breeding and

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