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**WHY FRUIT TREES ARE WINTER KILLED**

While it is very seldom that the winter in this climate is severe enough to require any particular protection for fruit trees, there have been winters when many trees have been frosted and the old saying that an ounce of prevention is worth a pound of cure still holds good. The U. S. Agricultural Department has compiled some valuable information on this subject which has been recently published in the Practical Fruit Grower, and is as follows:

About once in a decade, and sometimes oftener, a severe winter occurs in which an unusually large number of fruit trees are killed. An examination of the orchards after such winters shows many irregularities as to the extent of the injuries in orchards differently located and managed. Some varieties of fruits are uniformly less hardy than others, and the winter injury to these sorts may be traced directly to their greater tenderness. On the other hand, trees normally perfectly hardy in a locality may suffer serious injuries or be entirely killed during such "winter" seasons, while other trees of the same varieties in the same orchard may escape injury entirely. During the prolonged cold winter of 1903-4 great losses were suffered by orchardists in the Lake Erie peach belt. Some orchards were entirely destroyed; others were apparently unharmed and came through the winter in a vigorous, hardy condition, and still others, while suffering severely, yet contained sections, rows or parts of rows, or individual trees that came through the winter uninjured.

Many theories were advanced by the orchardists as to the cause of these anomalies, and many contradictions appeared. The theory of insufficient drainage, which might be advanced as the cause of injury in one orchard, would receive the opposite sanction in the next. If an orchard on elevated ground escaped in one instance it might be partially or entirely killed in another. In order to learn the cause of these irregularities, the horticulturist of the Ohio Experiment Station and his assistants visited both injured and uninjured orchards in Catawba Island and the peninsula of Emma, Ohio county, in Ohio, and made a thorough study of the matter, reporting the results of their investigations in a recent bulletin of the station.

Their investigations show that while a general or direct cause of the injury was, of course, the severe and long-continued cold, the specific causes of the varying degrees of injury were exceedingly numerous. Generally speaking, it was found that where the vitality of the tree or orchard had been lowered by any cause whatever during its previous history the chances of injury to the tree by the cold were much increased. Factors observed in different orchards which contributed to low vitality in the trees were an insufficient degree of fertility, a low physical condition of the soil, prevalence of San Jose scale, leaf curl, peach tree borers, extremely dry condition of the ground in some sodded and gravelly ridges, "water-logged" soils, etc.

There was a marked contrast in the extent of the winter injury on bare soils—soils given clean cultivation—and on covered soils. The bare soils freeze deeper and the injury was much greater than on soils covered with a mulch or other material. The greater depth to which bare soils freeze in winter than covered soils was brought out in an experiment made at the station. A plot of peaches in an exposed situation was selected and a strip of sod 10 to 12 feet wide removed from one row, leaving the bare surface of the soil fully exposed to the cold. Another row alongside was left in grass which had been clipped and allowed to lie upon the ground. Where the sod was removed the ground froze to a depth of 18 inches, while under the thin sod covering of grass and weeds in the other row the ground froze to a depth of about 8 inches. The trees in the bare ground were very slow in starting into growth the following spring of 1904. All of the trees in this row were seriously injured by the cold, many branches dying, while in one case the entire tree was so badly injured that but few leaves appeared throughout the season, and those upon shoots so feeble and slender that the tree might well be considered dead. Later in the season, however, some of the trees rallied slightly, though all showed a serious lack of vitality. The trees in the sod did not suffer in the least degree, all making a healthy, uniform growth during the season of 1904.

The value of an annual clover crop as compared with clean cultivation was found in an orchard eighteen years planted, one-half of which had been cultivated during the first half of each season and then sown to crimson clover, while the other half was given clean cultivation during the growing season. Upon the clean culture area there was a much greater percentage of injury from the cold of the winter than upon the crimson clover section. Where the clover crops had been grown and plowed down the trees showed remarkably healthy, heavy, dark green foliage, contrasting sharply with the yellowish, sickly foliage of the clean-culture plot. Another grower in the injured peach region stated that not a single orchard or section of an orchard of which he knew, that had received even a light dressing of baryard manure within the last year or two,

had suffered noticeably from the cold. A 13-year-old orchard of 600 trees was found located on shallow limestone soil covered with a dense, heavy growth of blue grass. The San Jose scale had wrought havoc in the neighborhood, but it had been kept under control in his orchard by spraying. As a result, not a tree in the whole block was killed by cold. Across the road from this orchard was another, located on similar soil and also in sod, but in which the scale had not been controlled. The story is told in two words—entirely dead.

Another instance is cited in which an orchard was sprayed in the spring of 1902 for the control of the scale, with the exception of three rows through the middle, which were overlooked. As a result, the scale increased rapidly during this season on these unsprayed trees, and they were also attacked by leaf curl, which practically defoliated them. The whole orchard was sprayed in 1903, nevertheless the trees had been so weakened by the leaf curl of the preceding year that the good care given them in 1903 was unavailing, and every tree in the three rows was killed, while every tree on either side of them which had been sprayed came through the winter sound, vigorous and healthy.

A very simple, easy and very effective method of preventing winter killing of peach trees was observed in the orchard of one grower. Just before winter set in this grower hauled manure to the orchard, but instead of scattering it beneath the trees in the usual way he lanked a very few forkfuls immediately around the stem of the tree. When the supply of manure ran out he put a rib or two into the orchard and banked it around the stem of the tree in the same manner. The results from the use of these materials were uniform and surprising as it may seem, every tree that received this simple treatment survived the winter without the least injury from cold, while the few trees and sections of rows left here and there unbanked and serving as "checks" in the experiment died, almost to a tree. Another orchard of some 500 trees a little farther to the west of this orchard, which had received the same high culture and good care, with the exception of the simple banking process, was almost a total loss. The trees in these orchards were extremely vigorous and had made a rank growth, which made them peculiarly susceptible to injury by freezing.

On the same farm trees on a piece of ground which was so stony that it could not be cultivated, and which was kept in blue grass sod, with a heavy mulch of coarse material, such as corn stalks, barnyard manure, etc., about the stems according to the true "sod-and-mulch" method, came through the winter without injury. These investigations bring out strikingly the necessity of such continuous and thorough cultural practices in the orchard as shall maintain the trees at all times in a vigorous, healthy condition. The fertility and vegetable matter of the soil must be maintained by the addition of manure or the growing of clover crops. Spraying to control insect pests and fungus diseases must be thorough and unremittent. Trees on undrained or very rich soil, trees weakened by over bearing or by borers, all alike invite winter injury. Clover crops and manures protect the ground from deep freezing and resultant winter injury. Sod serves the same purpose. Banking up the trunks with a few shovelfuls of manure or earth appears to have a marked favorable influence.

Young Love and Old. The spirit of Christmas saturates the pages of Lippincott's Magazine for December. "A Moment of Confidence" by Elia Middleton Tybout (whose "Wife of the Secretary of State" is one of the books of the year), exhales the season of good cheer beside the glowing fire. As sparks fly upward a new love is born on one side of the curtain; while on the other, old loves are rekindled in the confidence of a man and a woman who have weathered love's battles. But the scars are there, and to these scars they now point not without pride. Miss Tybout's treatment is delicate and sympathetic.

Provides an Incentive for Rebates. "The president in his last annual message," so writes Samuel Spencer in a pamphlet which was read before the Board of Trade of the city of Newark, N. J., "laid special emphasis upon the necessity for doing away with rebates, and for the keeping of the highways of transportation open to all upon equal terms. There is no issue or controversy before the people of Congress as to whether or not rebates or secret discriminations should be stopped. No one desires more than the railway managers themselves that there should be an end to all such practices. They are as detrimental to the transportation interests as they are to the great body of shippers."

"No rational suggestions have been made, however, as to how the granting of rate-making power to the interstate Commerce Commission could be effective to this end. A rebate or any secret discriminatory device can, of course, be applied to a Governmental made rate as well as to one made by the carrier."

"In fact a rate established by the Commission, and thereafter unalterable by the carrier in reduction or otherwise, except upon petition to the Commission, instead of serving as a cure or a preventive would be a distinct incentive towards secret reduction when commercial conditions demanded an a public and legal reduction could not be properly made."

Give Your Stomach Rest. Nothing will cure indigestion that doesn't digest the food, itself, and give the stomach rest. You can't expect that a weak stomach will regain its strength and get well when it is compelled to do the full work that a sound stomach should do. You wouldn't expect a sick horse to get well when it is compelled to do a full day's work every day of the week. Kodol Dyspepsia Cure is a perfect digestant and digests the food regardless of the condition of your stomach. Relieves Indigestion, Belching, Sour Stomach, and all stomach disorders. Sold by G. E. Williams.

Would Like to Know. There is a good deal of curiosity as to whether the fruit growers of other portions of Oregon intend to allow the Hood River growers to have things all their own way in the contest for the array of cups to be awarded on apple exhibits at the annual meeting of the State Horticultural Society, which is to be held in Portland in January. Rural Northwest. The mission of "Early Risers" is to clear the way and give Nature full sway. These famous little pills rid the stomach and bowels of all putrid matter, thus removing the causes of headache, constipation, sallow complexion, etc. De Witt's Little Early Risers never grip or sicken. A safe, pleasant, perfect pill. Sold by G. E. Williams.

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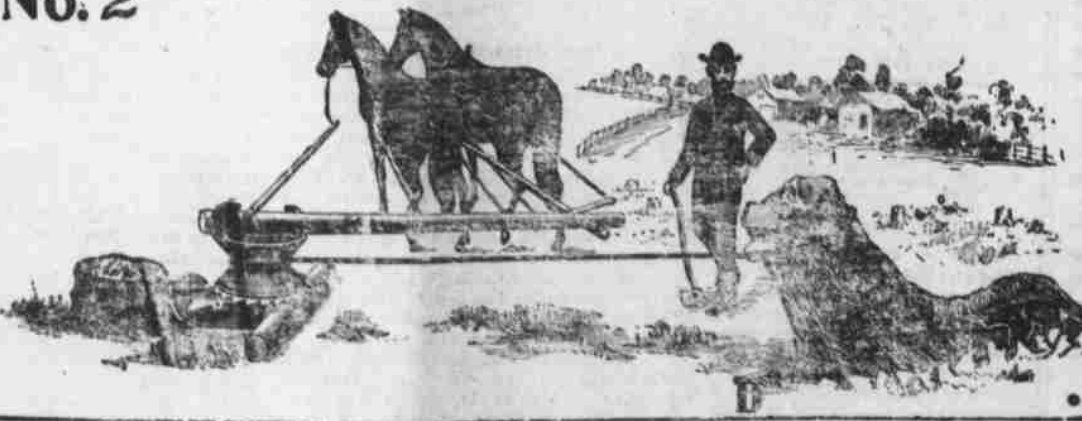
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