

Tomorrow's fruit pickers could have metal fingers

KEARNEYSVILLE, WV — Fresh market fruit may some day be pushed from the tree by long aluminum fingers rather than plucked by human hands. But before this can occur, the shape of American orchards will have to change, a USDA agricultural engineer observes.

Trellised orchards are a common sight in many parts of Europe and other areas of the world where land is scarce, but they would constitute a revolution in the U.S. fruit industry.

Donald L. Peterson of USDA's Agricultural Research Service said that orchardists still turn to hand labor to pick fresh market apples and peaches even though there are a number of commercial mechanical harvesters that shake the tree and catch the falling fruit. A number of other devices designed to rake or rotate the fruit off the tree have not made it to the commercial stage.

The problem? With apples, it's too much bruising, says Peterson. Vigorous shaking causes the clustered fruit to knock together before detaching. And falling fruit may bounce off a lower branch on the way to the catching surface. Apples, Peterson pointed out, are more prone to bruising than peaches because they are picked riper. However, because the peach crop ripens unevenly over a two-week period, vigorous shaking causes some peaches to detach before they are ripe enough.

The solution? Gently push the fruit off a tree whose branches are all on the same level.

To gently push the fruit, Peterson designed a simple device that can be attached to a tractor or self-propelled machine and lowered through the fruiting branches. This rod press fruit remover, as Peterson calls it,

consists of an aluminum panel projecting closely spaced rods—the fruit pushers. At first sight, it calls to mind a giant-size Indian bed of nails upside-down, but its effect on the tree and its fruit is quite the reverse.

The aluminum rods have rubber tips to protect the tender fruit, and each is equipped with a spring tension release in case it comes to rest on a branch instead. After a certain pressure, the release allows the rod to slide back through the panel and thus prevent the limb from snapping. As the device is withdrawn from the tree, the released rods are automatically reset. A padded catching surface beneath the branches collects the falling fruit.

The result of this careful engineering has proven equal to or better than good hand-harvesting in preliminary tests, Peterson said. He and colleagues at the Appalachian Fruit Research Station harvested 80 to 90 percent Fancy - Extra Fancy apples and 88 percent No. 1 grade peaches with this equipment. Hand-harvesting yields anywhere from 60 to 90 percent fruit of this quality, depending on the experience of the picker.

Peterson said the rod press remover can be adapted to large or small fruit growing enterprises by simply changing the size of the panel. Before the device can be useful, however, the grower must have properly shaped trees, and that will probably require trellising.

Horticulturist Stephen S. Miller, also at the Appalachian Fruit Research Station, works closely with Peterson to develop tree shapes compatible with mechanical harvesting. He has trained peach trees in a "V" shape by adapting the Australian-

developed Tatura trellis. Because these trees have only two scaffold limbs projecting from opposite sides of the tree, there are no limbs in the path of falling fruit.

For apples, Peterson and cooperators at West Virginia University are experimenting with a Lincoln canopy trellis developed in New Zealand. The trees are trained in a "T" shape with the fruiting branches growing in a single horizontal tier supported by a post-and-wire system running down the row. Miller is also developing free-standing apple trees with compact fruiting canopies.

Trellised orchards have not

caught on in the U.S., said Peterson, because of the initial cost of setting them up. He predicts, however, that they may prove to be less costly and labor intensive to maintain because they lend themselves to mechanization. They also bear a harvestable crop sooner.

Miklos Faust, plant physiologist and chief of the ARS Fruit Laboratory at the Beltsville Agricultural Research Center, said that very high-density orchards of dwarf trees (700 to 1,000 trees per acre) have become more

popular in Europe because of the scarcity of land. (Dwarf trees require trellising because of their systems.) Land costs in Europe are six to seven times higher than in the U.S., he explained, making the initial outlay for a trellised orchard a fraction (one-third to one-half) of land value. In the U.S., however, trellising costs may run two to three times more than the land.

For more information on the rod press fruit remover, contact the Ag Research Service at Beltsville, Md.

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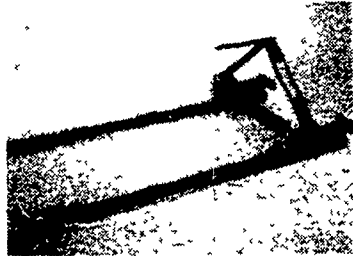


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