

# Penn State's 5-wire fence controls deer

UNIVERSITY PARK — Wildlife managers at Penn State have developed a practical and economical way to control crop damage from deer. Their method uses the Penn State 5-wire electric fence — tested by farmers, foresters, orchard owners, and tree nursery operators.

Design of the fence is based on deer behavior. Deer usually try to go under or through a fence instead of jumping it, says John L. George, professor emeritus of wildlife management at Penn State.

"Deer get a high voltage shock when they try to penetrate the 5-wire fence," George said. "This changes their behavior and thereafter they generally avoid the fence."

George and associates William L. Palmer and Robert G. Wingard described their findings in a recent report from the College of Agriculture at Penn State.

The Penn Staters found that wire spacing and shape or configuration of the 5-wire fence are important. The bottom wire should be kept about 10 inches from the ground with the other wires spaced at 12-inch intervals — making the fence about 58 inches high.

The design features high-tension wire, based on technology developed in Australia and New Zealand to control sheep, cattle, and horses.

Components, configuration, and construction differ from other electric fences. The key materials are high-tension, smooth steel wire; special accessories to maintain 250 pounds wire tension, smooth steel wire; special accessories to maintain 250 pounds wire tension; and high voltage, low-impedance energizers. The design was selected by the Penn Staters after testing many different fencing systems for cost and

effectiveness.

How well does it work? After losing 90 percent of his Christmas trees to deer following three plantings, a grower fenced his plot with the Penn State 5-wire. The deer did not penetrate the fence.

Growers of high value crops were positive: "There is no question but that the 5-wire fence is cost effective. For tomato fields we did not fence, we lost one-third to one-half of our crop — but there were no losses on the fenced fields."

An orchardist who erected the fence commented, "Since fencing our orchard, potential fruit buds have not been disturbed on limbs within browsing range."

Another orchard owner installed a long drift fence to modify deer movement — 5,000 feet long. He concluded, "With a fence eight years earlier, we could have increased our income by \$40,000

while investing only \$10,000 in production costs."

Penn State's largest test area for the 5-wire electric fence is a 120 acre section of the Rock Springs Agricultural Research Center about 10 miles southwest of the campus. The superintendent of one area commented that "our research would be impossible without the deer fence."

Early deer fencing experiments at Rock Springs usually ended in failure — the deer got through. This occurred despite the use of an expensive 8-foot woven wire fence. Deer penetrated the fence anywhere there was a slight irregularity in the land where 18 inches allowed deer to crawl through. Deep, well-worn deer trails led to these gaps.

Owners of the Penn State 5-wire fence emphasize the importance of proper initial construction and good maintenance. Straight lines also help ease maintenance practices such as mowing or spraying to control weeds.

"High tension wire fences must be built with strong corners to keep wires tight," Dr. George commented. "The null of five wires

about 1,250 pounds, may catapult insecure posts not in line or low in spots."

Large variations exist in costs of labor and construction for the 5-wire fence. Some growers erect the fence themselves, it was noted. Other landowners rely on contractors. Costs are affected by site preparation, terrain, ease of driving posts, and skill in building fences.

The Penn Staters give two examples of complete costs for materials and labor. In 1980, a contractor erected 12,700 feet of fence around 120 acres, with numerous gates and irregularities, for \$7,400. That's about 58 cents a linear foot, including energizer and gates.

In 1982, a 5,000 foot fence with gates, energizer, and odd angles and bends was contracted for \$4,750 — about 95 cents per linear foot. And the U.S. Forest Service had a fence constructed for 60 cents per linear foot.

"Thus, we feel that 60 cents to \$1.00 per linear foot are reasonable estimates of costs, including materials and labor," George stated.

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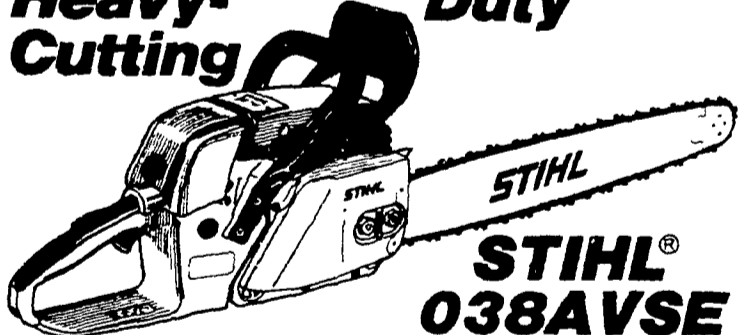


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