

## Control Netting as a Hazard to Birds

Bird damage to grapes in the United States is a serious economic problem. In 1972 this damage resulted in an estimated loss to grape growers of over \$ 4 millions (Crane *et al.*, 1976). Both lethal (shooting and poison) and non-lethal (exploders, scarecrows, traps, and chemical repellents) methods have been employed to protect grapes. Netting is considered one of the most effective non-lethal methods of preventing bird damage; however, the high cost per protected acre (1 acre = 0.405 ha) has in the past limited its use. The recent development of less expensive netting materials has led to an increased use of netting in vineyards.

In Yamhill County, Oregon, in September and October 1978, two types of netting were used by a grower to protect grapes in a single vineyard. One type was Xironet<sup>R</sup> (Xiro AG, Case postale 30, CH-1700 Fribourg 7, Switzerland), a yellow, light-weight, flexible, diamond-shaped mesh (6 cm × 4 cm) Swiss netting which costs about \$350 per hectare of vineyard protected. The other type was DuPont Vexar<sup>R</sup> (E. I. DuPont de Nemours and Company, Wilmington, Delaware 19898, USA), a black, semi-rigid, square-shaped mesh (2 cm), which costs from \$350 to \$600 per hectare protected. (Reference to commercial products does not imply U.S.



Government endorsement.) Both materials were used to cover single rows of vines, but Xironet was sometimes draped over two adjacent rows—forming a single canopy of netting which was secured at the base with wooden poles (Fig. 1). The single-row application for both netting types utilized strips of netting about 1 metre wide, attached to the upper trellis wire and secured at the base with wooden poles.



Fig. 1. Grapes protected from depredating birds with 'Xironet'.

Approximately 2500 m<sup>2</sup> of Xironet protected 329 vines (208 under two-row canopies requiring slightly more netting per vine), whereas nearly 500 m<sup>2</sup> of DuPont Vexar protected 80 vines. Protected vines were primarily on the periphery of the vineyard, adjacent to woodlands and orchards from which birds usually entered. All netting was installed on 15 September 1978.

The initial observation on 7 October revealed 77 birds entangled in the Xironet netting, 74 of which died presumably from strangulation, shock, or starvation. Daily observations (0700-1100 hours) during the next 2 weeks revealed 61 additional birds entangled. A total of 138 birds comprising seven species were thus entangled, of which 95% were American Robins (*Turdus migratorius*, Fig. 2). Other bird species entangled were two Cedar Waxwings (*Bombycilla cedrorum*), and one each of Varied Thrush (*Ixoreus naevius*), Common Flicker (*Colaptes auratus*), Screech Owl (*Otus asio*), Golden-crowned Sparrow (*Zonotrichia atricapilla*), and California Quail (*Lophortyx californicus*).

The above data indicate a rate of 3.8 birds entangled per day of exposure. In terms of the area protected, Xironet entangled 0.42 birds per vine protected, or more than 5 birds per 100 m<sup>2</sup> of netting. As installed in the observed vineyard, Xironet, advertised as a 'disposable' bird control netting that protects 'without injuring or destroying the animals', clearly did not meet those claims. Although all observations were made at one



Fig. 2. American Robin entangled in 'Xironet' bird-control netting.

vineyard, similar non-selective entanglement of birds in Xironet has been previously reported by Meylan (1978). In contrast, similar observations of DuPont Vexar netting during the same period revealed no bird entanglement.

The bird entanglement associated with this vineyard indicates the potential for excessive mortality among normally desirable species if the use of Xironet becomes widespread. Entanglement in Xironet is non-selective, and raptorial species are entrapped along with potentially destructive species. Protection of grapes from depredating birds should therefore be afforded by more environmentally sound methods than using Xironet.

Xironet distributors informed us that they are currently modifying use-directions and installation procedures, utilizing rigid netting material at the base of installed Xironet as well as providing technical assistance to users in attempts to minimize entanglement problems.

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