

Title: Use of Dura-Line monofilament as a replacement for high-tensile wire in trellis construction and netting support with small fruit crops

Progress Report

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Extension Proposal

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Objectives:

- 1) To demonstrate the use of Dura-Line monofilament as a replacement for high-tensile wire for use as cropload wires, catch wires and irrigation line support wires in small fruit crop trellising.
- 2) To evaluate the use of Dura-Line monofilament as support for crop netting used for bird control in small fruit crops.
- 3) To develop equipment and methods for use in putting out wires for trellises and netting support in small fruit crops.

Justification and Description:

Support systems (trellises) are used in several small fruit crops (grapes, blackberries, raspberries) to support fruiting canes, as catch wires to orient new growth for optimal light interception and shade prevention in the fruiting zone and to suspend trickle irrigation lines so they are less apt to be damaged in ground maintenance operations.

Bird damage is becoming an increasing problem in most small fruit crops and netting applied prior to fruit ripening and maintained through harvest is becoming more of an economic necessity for many growers. For optimal results, the netting needs to be suspended above the crop canopy.

High tensile steel or aluminum wires of various gauges have been used in trellising and netting support. Wires are expensive to install due to the cost of the material and the difficulty involved in putting it in place and to maintain since they need to be retensioned annually to maintain their proper function. Wires are difficult to handle. They are heavy and can be dangerous due to the recoil that may occur if the wire should break. In addition, wires conduct electricity well so plant damage can be severe in the case of a lightning strike in the planting. Finally, corrosion is a serious concern with uncoated wires or where the coating is damaged as the wire is tightened and secured. Removal and disposal of metal wire when no longer needed can be a problem.

Dura-Line monofilament, manufactured by Bayer, is available in several gauges similar to metal wires for different uses in trellising and netting support. It has been used for several years in many European countries and found to be acceptable under their conditions. Monofilament has a cost advantage over metal wires. With proper equipment and techniques it may be possible to “string” several wires on two rows at the same time resulting in a substantial time savings. Unlike metal wire, monofilament does not require special hardware to secure it on end posts. In the event that it should get broken or cut, splicing it is not a difficult task. When properly installed and tightened, retensioning should not be necessary. Monofilament is much lighter and less prone to dangerous recoil as metal wire if it should break or slip loose while being installed and tensioned. Due to its UV and weather resistance properties, monofilament has held up over 25 years in European vineyards. Other characteristics favoring monofilament are its freedom from corrosion and lack of electrical conductivity. If a planting is removed, the monofilament can be respooled for use at a future time or burned if no longer needed.

Methodologies:

Trellising

Both 12.5 gauge and 8 gauge monofilament lines were installed as the cordon wire on a VSP grape trellis at the Plateau Research and Education Center. High-tensile 12.5 gauge wire was used for comparison purposes. All were tensioned to identical levels using a torque wrench and inline tensioners. An eight-pound weight was hung from the monofilament lines and the high-tensile wire midway between the third and fourth and seventh and eighth line posts. Line sag was recorded for each. This will be repeated in spring to determine how much retensioning is needed for each

Net Support

Demonstrations using 12.5 and 8 gauge monofilament line versus 12.5 gauge high-tensile wire for bird netting support were initiated in blueberry and grape plantings at the Highland Rim, Middle Tennessee and Plateau Research and Education Centers. For net support on individual rows, 24-inch extensions were fastened to end posts and line posts on the trellis. Monofilament line and high-tensile wire were secured to the top of the extensions down the rows to position the net above the crop canopy. Where an entire block was encased in netting as opposed to individual rows, an extra post extending 8 feet aboveground and 30 feet out from the end post were set at both ends of the rows and the monofilament lines and wire was extended out to them. Similarly, posts were set 10 feet beyond the outside rows with monofilament line or high-tensile wire at the top to allow netting to extend far enough out from the row to allow for equipment travel within the netted block.

Demonstrations in both trellis and net support using monofilament line instead of high-tensile metal wire were included as part of field day presentations at the Middle Tennessee and Plateau Research and Education Centers.

Results:

Initial results showed that the 12.5 gauge monofilament was equivalent to the 12.5 gauge high-tensile wire. The 8 gauge monofilament exhibited less sag when used a netting support.

For the netting system over an entire portion of the vineyard, support posts had to be well-anchored to prevent leaning as the monofilament and high-tensile wire were tightened. Netting on grapes were applied prior to veraison and removed within 30 days following harvest. Netting on blueberries was applied in mid-June and remained on until mid-September. During this interval, no differences were detected in sag of the different materials.

Conclusions:

At the end of the 2008 harvest, indications were that the 12.5 gauge monofilament line would be comparable to the 12.5 gauge high-tensile wire and that the 8 gauge monofilament would be superior in its ability to support the nets without sagging. Further work to more fully evaluate the characteristics for monofilament line need to be

conducted in 2009. The manufacturer claims that monofilament line tensioned properly at installation will retain the original tension over time, unlike high-tensile wire. The measurements of line sag with the 8 pound weight outlined above will be repeated in spring and later in the growing season to determine if retensioning is needed.

Due to an injury and subsequent surgery, work on methods of stringing the monofilament line could not be done in 2008. This work is planned for 2009.