

## Grow Tubes – The Benefits

The utilization of grow tubes is a fairly recent technique, gaining popularity over the past 10 years. Consequently their utilization has become fairly widespread and accepted before adequate short and long term research has been conducted, or even before experience has been obtained under actual vineyard conditions in the region. The object of this article is to present some of the benefits. My goal is not to encourage or stop growers from using them but to raise some points to consider along with all of the other options when making decisions about establishing new vines.

Grow tubes have shown some distinct advantages for establishment. Grow tubes get the vine off to a quick start by promoting upright, rapid growth without the added labor of tying to stakes. During dry periods without irrigation they can provide moisture at the base from condensation that aids in establishment. The tubes also protect young vines from pests such as rabbits and deer if other means of protection are not in place. From the new grower's standpoint, maybe their best attribute is to reduce the danger to the vine when applying post-emergence or contact herbicides.

### Differences Among Tubes

Grow tubes are available in a multitude of shapes (square, triangular, and round), sizes (height and diameter), colors, and configurations. Some tubes are preassembled and oth-

ers require assembly; some a split and some solid. Cost is a major factor, with plant densities ranging from 500 to 1500 plant per acre. A significant cost consideration is life expectancy, and a tube with ultraviolet light blockers may last 3 to 5 seasons.

Round tubes offer less wind resistance than square and have a greater area than triangular tubes for the same diameter tube. Split tubes allow plant maintenance during the growing season and can be removed without taking the vine off the cordon wire, allowing them to be left on later in the season. Tubes are available in several heights ranging from 18 to 36 inches. Utilizing a tube 30 to 36 inches has multiple advantages, including a reduction in labor required for vine training, and you may not need an individual vine stake if the tube can be attached to the cordon wire.

### Speed of Growth

The growth rate of a newly planted vine depends on many factors including water, sunlight, temperature, soil conditions, rootstock and age of the plant. The faster the vines gets up to the fruiting wire and produces its scaffold of cordons, the faster the vine can be allowed to produce. Growth rates of almost two inches per day have been reported using grow tubes in Australia (Due, 1996). Internode lengths are often longer in the portion of the trunk covered by the tube due to rapid growth.

This can result in fewer water sprouts in subsequent years and a further reduction in labor.

Tube diameter may play a role in the production of strong vines with thick trunks and large root systems. Studies conducted on Cabernet Sauvignon vines at California State University, Fresno, during the 1995 growing season, have shown that tube diameter affects vine mass. Vines grown in 2.5 inch tubes never reached topping height, and vines grown in milk cartons grew for 139 days before reaching topping height. Vines grown in 4.5 inch tubes reached topping height in 108 days, and vines grown in 3.5 inch tubes reached topping height in 96 days. In addition, vines grown in 3.5 inch and 4.5 inch tubes had greater stem diameter and root mass than the vines grown in milk cartons. The vines grown in the 4.5 inch tubes produced double the stem and root mass of vines grown in milk cartons and a larger stem and root mass than the 3.5 inch tubes. Larger diameter tubes also are more conducive for producing multiple trunks, as is typically recommended in the Mid-Atlantic.

In another study in Arkansas (Main, 1997), control vines (no grow tubes) with all lateral shoot removed started growing slowly but reached the 6 foot cordon height on 4 out of 5 cultivars by the end of the growing season. Internode lengths at a 24 inch trunk height were about 1.5 inches longer on plants with grow tubes than the controls. There was no difference in internode lengths at a trunk height of 48 inches. It was possible to establish eight feet of cordon, at a 6 foot cordon height, on three of the five varieties tested when using the tubes.

## **Tube Installation and Removal**

Grow tubes are applied after normal vineyard planting. Split tubes should be applied with the seam parallel to the row and away from

prevailing winds. Mound 3 to 4 inches of soil around the base of the tubes to secure, minimize the possibility of herbicide spray entering the tubes, and maximize the greenhouse effect. As soon as the vine grows above the tube, the tube is no longer significantly influencing the growth rate of the vine and can be removed. They should be removed by early September unless protection from animals and herbicides is still required. Grow tubes must be removed before cold temperatures arrive to allow adequate time for the plants to harden off. If tubes are left in place through the winter they may cause winter kill either through loss of dormancy or extreme heat to freezing temperature fluctuations.

## **Irrigation**

Although it is recommended, most vineyards in the East do not have irrigation, which can be a hindrance to establishment in drought years. Grow tubes tend to recycle water by condensing humidity and allowing it to run down to the soil. If you have irrigation, be careful not to over water as grow tubes delay soil drying (Due, 1996).

## **Conclusions**

Grow tubes can create many benefits for vine establishment. They can speed the early grapevine encourage upright growth. They protect against wind desiccation, physical damage, and damage from herbicide and small mammals. They can be especially helpful in replant situations where weed management is complicated. Care must be taken with proper timing of removal.

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### **Grow Tubes - Benefits**

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