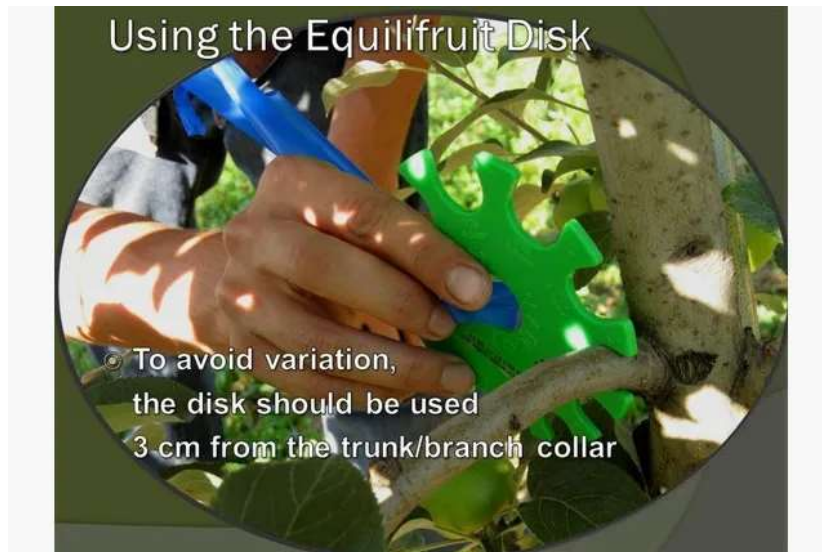


Apple Crop Load Management - A Hand-thinning Gauge

The Equilifruit disc, developed in France, has potential as a hand-thinning gauge in tall spindle apple.

Updated: October 25, 2017



We evaluated the use of the Equilifruit disc, developed in France, as a hand-thinning gauge on three cultivars trained to tall spindle. While the disc was developed for trees that have been trained to the centrifugal system, our results suggest that the Equilifruit has potential as a hand-thinning gauge in tall spindle apple (Kon et al., 2012).

Introduction

The Equilifruit disc was designed by the MAFCOT group of the National Institute for Agricultural Research (INRA) as a supplemental tool for the centrifugal tree training system (Lespinasse and Lauri, 1999; MAFCOT 2000). The disc has two uses in this system: 1) as a hand-held reference for spur extinction pruning, and 2) as a hand-thinning gauge. In the centrifugal training system, crop load potential is adjusted to a target number of fruiting structures per unit limb cross-sectional area (cm^2 , LCSA). If fruit set is supra-optimal, then the disc is also utilized as a reference to reduce crop load to the desired target.

This round, plastic disc has 11 semi-circular notches of varying diameters along its perimeter. At each notch, there are two corresponding values that are of interest to the user: the F-value and the delta value (Ω). The F-value is the number of fruiting spurs or fruit that should remain after spur extinction and/or hand thinning treatments. Use of the F-value during hand-thinning will result in ≈ 6 fruit per unit LCSA. The delta value is a built-in adjustment factor to consistently increase or decrease the number of fruit (or fruiting spurs) per unit LCSA.

Since the disc uses the cross-sectional area of a given limb to estimate bearing surface, major alterations of the bearing surface may prevent proper use of the tool. For example, bench cuts can result in an overestimate of the number of fruit that can be best supported. The Equilifruit disc is most effective on spindle-type trees with renewal style pruning.

We evaluated the use of the Equilifruit as a hand-thinning gauge on three cultivars trained to tall spindle. While the disc was developed for trees that have been trained to the centrifugal system, our results suggest that the Equilifruit has potential as a hand-thinning gauge in tall spindle apple (Kon et al., 2012).

How to Use the Equilifruit Disc

To assure that each limb is properly measured and adjusted, start at the lowest limb on the tree and systematically work to the top of the tree until completed.

Approach a limb, place disc approximately 3 cm away from the trunk of the tree. Find the notch in the disc that fits snugly around the limb. Refer to the F-value that corresponds to the selected notch. This is the number of fruit that should be left on the limb after hand thinning.

Count / estimate the number of fruit that are present on the selected limb. If the number of fruit is greater than the F-value, then hand-thinning is necessary.

It is important to be selective when hand-thinning. Remove the following fruit in order of importance: 1) injured/damaged fruit, 2) small fruit, and 3) break up clusters of fruit / maintain structural integrity of the limb. Other hand-thinning recommendations emphasize the spatial distribution of fruit throughout the canopy; however, this system focuses on adjusting the number of fruit per unit limb size.

Other Considerations

Thinning the leader: Either select an arbitrary point near the terminus of the central leader (ex: the top wire) or take note of the point at which there are many small limbs that cannot be measured with the smallest notch of the disc. At this point, use the disc on the leader and thin accordingly.

Small branches: If limbs are smaller than 0.5 cm² (the smallest notch on the disc), then discretion is used to designate the number of fruit that will remain on the limb, either 1 or 2 fruit.

Delta values: The delta value (Δ) is a means of adjusting the F-value. Subtracting or adding delta from the F value can be utilized to intensify or reduce the hand thinning treatment and reduce or increase cropload in a consistent fashion (See graph). While delta values may be useful to further reduce cropload on younger trees, the standard F value gave the best results for mature trees in our trials.

Conclusions

In all cultivars, trees thinned to the specifications of the F-value maintained yields comparable to control trees while increasing fruit size. After using the disc for a few hours, the user becomes proficient in relating limb size to an appropriate fruit number. The disc should be utilized as a training device and after sufficient experience is obtained by the worker, the disc should only be used to "re-calibrate" as needed.

Obtaining an Equilifruit Disc

Valent BioSciences, Inc. made a supply of complementary discs in 2013. Contact your ag chemical distributor to request discs.

References

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Expertise

- Tree fruit production
 - Orchard management systems
 - Crop load management of tree fruit
 - Fruit tree pruning and training
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