

VINEYARDS

CANOPY MANAGEMENT

**CALU DEMO
FARM**
FACTSHEET
August 2010



INTRODUCTION

Canopy management is one of the most critical vineyard tasks. A range of techniques can be used to alter the position or amount of leaves, shoots and fruit on the vine. Effective canopy management helps to ensure the vine health, fruit ripening and optimum balance between fruit and foliage for economic production. Producing the optimum leaf and fruit exposure to the sun helps to reduce disease and push up the quality-to- yield ratio: more grapes of a better quality. Ideally, a canopy should have most of its leaves well exposed to sunlight and air-circulation will be good. A well-exposed canopy with adequate leaf area promotes the growth and ripening of fruit. Air circulation promotes rapid drying after rain, which provides a less favourable environment for fungal disease development.

On the 5th August 2010, CALU held a Vineyard 'Canopy Management' workshop at Ty Croes Vineyard with the kind permission of Harry Dean. Simon Day of 'Vine and Wine Ltd' led the workshop, and it was funded by the Farming Connect Land Management Knowledge Transfer Programme.

AIMS OF CANOPY MANAGEMENT

Effective canopy management should be both proactive (anticipating changes in the canopy) and reactive (by responding to these changes in the canopy) in order to maximize sustainable yields of high quality fruit. The ultimate aims are: to improve grape composition; to improve yield; to reduce diseases (e.g. powdery mildew and Botrytis); and to create a balanced and sustainable growth cycle. Ideally, the canopy is characterised by medium diameter shoots with moderate-length internodes and few lateral shoots. Shoots should be spaced about 3 inches apart and have about 15 normal-size leaves. Desirable shoot length is usually considered to be about 3 to 4 feet long, though each variety will vary.

CANOPY EVALUATION

A well managed canopy should have adequate, but not excessive, leaf area to support the intended crop load to the desired fruit ripeness. Shoot and leaf area assessments give a good indication of how vigorously the canopy is growing. Direct measurement of leaf area by removal is accurate but destructive and time-consuming, and not necessary in most cases. Weighing the current season's wood growth or counting nodes (the points at which the lateral buds grow out of the stem) and canes is much quicker and easier to perform. 'Indirect' sunfleck assessment is a non-destructive method used to assess canopy vigour. A rule or a rod placed at the fruit zone can be used to measure the length of the sunflecks to give an indication of the exposure of the fruit to sunlight. Where vines are poorly managed, the foliage will lessen vine exposure to sunlight and inhibit grape ripening. A well managed canopy should have approximately 50% of its fruit exposed to sunlight. Vines can be over-vigorous with a dense, shaded canopy, or excessively weak with inadequate (although well-exposed) leaf area.

VINEYARD SCORING ASSESSMENT

A scorecard method has been developed that evaluates a range of canopy factors to give an indication of vineyard performance. The scorecard assessment method is useful in that it allows wine producers to assess the impacts of amendments made on the vineyard (since monitoring can be repeated each year using the same criteria), and can track fruit composition and wine quality relative to predictions. Typically the method will assess: percentage canopy gaps; leaf size and colour; canopy density; and fruit exposure to sunlight; shoot length; lateral growth; and growing tips. Each characteristic is assigned a score in accordance with the scorecard.

During the afternoon session of this workshop, Simon Day demonstrated canopy assessment using the vineyard scoring method. Attendees were given score-cards (from 'Sunlight into wine- A handbook for winegrape canopy management', Smart & Robinson) to assess the vineyard.

The first three characters (canopy gaps, leaf size and leaf colour) were measured by standing away from the canopy vines and visually estimating the proportion of gaps in the canopy. 'Holes' occurring between spiky shoots at the edges of the canopy were not included. Leaf size and colour were estimated subjectively and assigned into a size category ranging from 'very small' to 'very large' (each category had its own score). Leaves in a basal to mid-shoot position were used to make this assessment; leaves that were green, healthy but slightly dull and pale were given the maximum score. Unhealthy leaves that were clearly showing signs of necrosis (premature death of cells and tissues) and chlorosis (leaves are pale, yellow or yellow-white in colour) were given the lowest score.

The remaining characteristics (canopy density, fruit exposure to sunlight, shoot length, lateral growth and number of growing tips) were assessed by standing at the canopy. Canopy density was assessed by placing face near to the fruiting zone and looking straight ahead. The number of leaves that had to be moved out of the line of sight before being able to see straight through the canopy was counted, and the result assigned a score according to the scorecard.

Percent fruit exposure is the ratio of visible fruit to fruit hidden by leaves, and was estimated visually. This process was repeated to get a representative number, and assigned a score in accordance with the scorecard. When estimating percentage fruit exposure it is important to consider that the canopy has two sides; fruit that might not be exposed on one side may well be on the other.

Shoot length was estimated by counting the nodes on some representative shoots (selected at random) and calculating the average length in cm (which corresponded with a score on the scorecard). When selecting shoots for measurement, care must be taken not to unconsciously select the longest shoots and skew results.

Lateral growth was also measured using shoots selected at random. The shoots were assigned into one of three categories; very vigorous lateral growth, moderate vigour or limited/ no vigour. 'Very vigorous lateral growth' describes laterals that are growing at most nodes, and the majority of them were longer than five nodes. 'Moderate vigour' describes where laterals were developed at about one third of the nodes on the shoot, and most laterals were less than four nodes long. 'Limited or no vigour' describes a canopy whereby laterals occurred infrequently, and did not develop to more than two nodes long. The overall score given for this canopy characteristic depended on the category which best described the canopy.

The proportion of actively growing tips was estimated by inspecting all of the tips and on the main shoots and laterals. Tips that have stopped growing have young leaves which can be folded in front of the growing tip whereas tips that are actively growing will always have a blunt 'apex' (or top) which extends above any young leaves on the shoot.

The total score for the vineyard was calculated by adding the totals for each character assessment. The scorecard gives high total points to a canopy which is very open, where vigour is moderate and where vines are under slight water and nutrient stress and low total points to a dense canopy, with high vigour shoots which are untrimmed.