

Vegetative and Reproductive Development of ‘Lapins’ Sweet Cherry Trees under Rain Protective Covering

B.N. Wallberg and K.X. Sagredo
Facultad de Ciencias Agronómicas
Universidad de Chile
Santiago
Chile

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Abstract

A study was carried out to evaluate the effect of rain protective covers on the vegetative and reproductive development and fruit quality of sweet cherry trees. The trial was conducted in the 2010-2011 season in a commercial orchard in Collipulli, Chile, with gabled (Vöen®) crop covers on 10 rows. In half of each row, trees were protected with rain covers from bud-burst, and the other half was protected from first red colour development of the fruit onwards; a treatment without protective rain cover served as control. The following variables were assessed: temperature, relative humidity, rainfall, phenology, intercepted photosynthetically active radiation (IPAR), fruit development, foliar area, flower bud differentiation, fruit set, vegetative growth and fruit quality at harvest and after conventional cold storage were measured. The protective covering filtered approximately 40% of incident PAR. Crop cover at bud-burst advanced tree phenology and increased shoot length. Fruits of cherry trees protected during the colour development phase showed less colour. Protective covering installed at bud-burst increased fruit size, weight and soluble solids concentration, but with more cracking at the style-end scar of the fruit and with reduced fruit firmness. Flower bud differentiation was advanced by both treatments.

INTRODUCTION

Growing sweet cherries in the Southernmost commercial production area of Chile (~37°50'S) allow farmers to harvest fruit from late December until the end of January, a period of low fruit offer in the markets of the Northern Hemisphere and, therefore, of high fruit prices and good economic returns. Unfortunately, in this area rain usually falls both at flowering and at harvest, causing severe economic losses and making this the main limiting factor for the expansion of the sweet cherry industry in this area. In ‘Lapins’, one of the cultivars grown in this area, fruit losses can be more than 30%.

In sweet cherry orchards, rain protective covers (RPC) are used worldwide to prevent or reduce fruit cracking in rainy areas. However, RPC have other side effects on the vegetative and reproductive growth of the trees. For instance, when RPC are used during the whole season, trees bloom 6 to 13 days earlier, harvest is advanced by 12 to 19 days, and soluble solids concentration increase in comparison with uncovered controls (Blanke and Balmer, 2005). The most susceptible period for cracking is from the start of colour formation to harvest and the use of RPC at this time can increase the percentage of commercial fruit harvested by about 40% (Børve et al., 2003).

The aim of this study was to evaluate the effect of RPC on the vegetative growth and on fruit development and quality, either covering the trees during the whole growing season or just from the start of colour development until harvest.

MATERIALS AND METHODS

The trial was conducted on mature ‘Lapins’ sweet cherry trees in a commercial orchard in the Collipulli area (38°0'4"S, 72°15'32"W) during the 2010-2011 season. Trees were 11-years old, planted at 2 m x 4 m spacing.

The RPC was provided by polyethylene covers (Vöen®, Vöhringer GmbH & Co. KG, Berg, Germany) of the gabled type put over 10 rows of 48 trees each. The RPC was