The effects of reflective ground film application on fruit quality, skin texture, bud break, return bloom and fruit formation of 'Hayward' kiwifruit

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Abstract

Light plays a fundamental role in plants in many ways, including plant growth, development and productivity. In kiwifruit, vines can often produce a dense canopy that results in low light levels in the fruiting zone at the lowest portion of the canopy. Therefore, to improve the light environment by changing the distribution of light throughout the canopy, reflective ground films can be applied in orchard. These films have now begun to see routine use in horticultural production in New Zealand, particularly within the pipfruit industry for fruit colour finishing. However, there are arguably extremely limited studies to date describing the reflective covers application in kiwifruit. In our study, the Ultramat white UV woven reflective ground cover was tested in a 22 year-old 'Hayward' kiwifruit orchard applied with T-bar in Plant Growth Unit of Massey University, New Zealand in Season 2011/2012. The aims of this study are to investigate the effects of the use of reflective films on the light environment in a kiwifruit orchard; on regulating fruit quality i.e. fruit fresh weight, fruit skin colour, fruit dry matter percentage and compounds such as phenolics in fruit skin as well as on enhancing bud break, return bloom and fruitset.

From our results, films had positive effects on fruit quality parameters, such as fruit fresh weight, firmness, soluble solids content and dry matter percentage, especially in fruit lower canopy. Besides the enhancements of individual fruit quality, films also showed a tendency to promote fruit quality consistency in fruit fresh weight and dry matter percentage. The application of reflective films may also appear to have an enhancement of bud break, return bloom and fruitset in the following season. However, there are still several aspects unknown in this study such as the relationship between reflective ground covers and kiwifruit skin phenolics content, and many of the differences described here were not statistically significant. Thus, to fully understand the effects of reflective ground covers in the future, more experiments are needed, and moreover, sample fruits should be measured based on storage time to further understand the effects of reflective ground covers on kiwifruit storage life.

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