RB21002 – Alternative growing media for hydroponic Rubus production

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RB21002 – Alternative growing media for hydroponic Rubus production – a desktop review – was commissioned in response to increasing costs and supply-chain interruptions of sourcing coir, the preferred substrate for a vast majority of hydroponic production, not only Rubus hydroponic production. Coir is also used on its own or mixed with other media for other berries, vegetables, mushrooms and nursery crops.

Substrate choice is a critical component in any hydroponic production system. Given the industry's heavy reliance on coir as a substrate, a review of current and emerging suitable substrate options for Rubus production was deemed necessary. The review is a risk-management strategy in the case that coir availability declined or costs continued to increase. Additionally, coir shipped over large distances internationally carries a large carbon emissions profile. Given the increasing spotlight on embedded carbon emissions within agricultural production, there may be a risk to social licence and potential cost increases should changes in carbon taxation policies be implemented.

The national and global scan to identify and analyse previously and currently used growing media, as well as emerging alternatives involved consultation with growers, substrate producers and industry representatives. These were the basis for an extensive desktop review. The review considered all potential substrate alternatives, not only those which had been used or developed specifically for Rubus hydroponic production. SWOT analyses were undertaken on all identified growing media options.

A novel wood-fibre substrate was identified as the currently most promising coir replacement. Further research is required to fine-tune its best use.

A comparative gross margin (GM) analysis was created to assess production systems using coir against a wood-fibre substrate. An economic threshold analysis was included to show at which substrate, berry price and yield the GM would not be adequate to cover variable costs of the substrate.

The economic analysis had to be based on available production data, and assumptions to fill data gaps for the new substrate. The GM analysis demonstrated that wood-fibre is likely to be cost-competitive when compared to coir assuming yield performance and durability are equivalent to coir. A high-level emission assessment was included for coir transport. The Excel based economic analysis model can be updated with actual data as it becomes available or used by producers to enter their own data.

The project demonstrated that wood-fibre substrates present a great opportunity for Rubus growers to diversify their substrate use. Further, long-term (over 3-4 production years) controlled trials are required to quantify any potential yield or production impacts when using 100% wood-fibre in comparison with coir and to understand any required changes in management practices including potentially mixing wood fibre with other materials.

A factsheet and a recorded webinar detailing and discussing the findings will be available on the Protected Cropping Australia and Berries Australia websites in coming weeks.

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