

New white seedless table grape, M 44-14, released

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Table grape industries throughout the world are adopting new, deliberately-bred varieties with a trend towards adoption of seedless types.

In Australia, a national approach to table grape breeding and evaluation has been undertaken since 1998 in collaborative projects involving CSIRO Plant Industry; the Department of Agriculture and Food, Western Australia; the Northern Territory Department of Regional Development and the Queensland Department of Employment, Economic Development and Innovation with support from the table grape industry and Horticulture Australia (HAL). A project steering committee, involving industry delegates from all participating states and the Australian Table Grape Growers Association (ATGA), research collaborators, HAL and CSIRO Plant Industry provides input into the development of breeding strategies and the adoption and commercial development of new varieties.

Breeding strategies have aimed to develop varieties which address specific market requirements in terms of key consumer based quality traits with an emphasis on seedlessness, disease resistance, early and late maturity to extend the harvest season and long storage life to allow access to more distant markets. Particular attention has been given to identifying white seedless selections with similar characteristics to Thompson Seedless,

but without obvious symptoms of berry collapse.

Key components of the program have involved:-

- Development of new progeny through breeding with an emphasis on seedless types.
- Evaluation of breeding progeny to identify promising types for larger scale assessment in multiplied plots and on various rootstocks.

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- Application of modern management practices to optimise performance and fruit quality of more advanced types, in a diverse range of production regions.
- Sensory assessment, beginning with industry groups and also some assessment at the consumer level.

To date, two new varieties, the early ripening white seeded muscat, M 51-18, and the black seedless selection, M 13-01, have been released with Plant Breeders Rights (PBR) protection.

Fruit of these varieties meeting specifications is marketed with the trademarks, Millennium Muscat™ and Magic Seedless®, respectively.

Here, we provide information on a third selection, M 44-14, which has been recommended for release from the program by the steering committee. M 44-14 is a late ripening, crisp textured, white seedless selection which has also shown considerable promise for long-term storage.

History of M 44-14

M 44-14 was identified as a seedless type among seedling progeny when first assessed in the field in 1999. It was produced from a conventional cross made at flowering in Spring 1992 and planted as a small seedling in the field in Spring 1993. After showing promise as a seedling, M 44-14 was established in a multiplied block on own roots in 2003 and top-worked onto rootstocks in 2004 for assessment as a potential table grape at CSIRO Merbein. It was targeted for national evaluation and placed in quarantine in Western Australia in 2004 and released in 2005. Plantings on a range of rootstocks were established in Queensland and the Northern Territory in 2005. Larger semi-commercial plantings were established in the Murray Valley (2 sites) and in Western Australia (4 sites) in 2008. These sites are being used to refine management practices and provide sufficient fruit for test marketing purposes.

Furthermore, a trial involving M 44-14 and a range of white seedless comparator varieties has been established to show distinctness, uniformity and stability of the selection in support of a PBR application.

Key attributes of M 44-14

M 44-14 produces a large, attractive bunch with large, firm crisp berries which develop a cream to golden colour at maturity.

Natural berries weigh about 4.6 grams, have a diameter of 18 millimetres and a length of 24 mm and tend to produce a bulge and taper towards the pedicel end. The berry has a distinctive waxy bloom which enhances its visual



Examples of M 44-14 showing colour change during ripening, with immature fruit on the left, ripe fruit (centre), and very ripe fruit on the right.



Examples of the high cropping potential of M 44-14 when grown in the Murray Valley (left) and in Western Australia (right).

appeal provided it is protected during handling. Under managed conditions the average bunch weight ranges from 450g to 950g, depending on berry size achieved and the severity of trimming. Sensory studies have shown that fruit from M 44-14 has been well received by growers and consumers. It should not be harvested until the maturity level reaches 19.5°Brix or a sugar: acid ratio greater than 32:1. At this level of maturity it is acceptable to 95% of consumers and the skin of the berry has a light green to pale cream colour. Compared to Thompson Seedless it maintains excellent quality characteristics in cool storage. As a late ripening variety, the storage results indicate excellent potential for late supply to domestic markets and transport to distant export markets.

General management requirements

M 44-14 is compatible with a wide range of rootstocks which are required to produce adequate vigour and canopy cover. M 44-14 is very fruitful, even in the subtropical environment of Carnarvon, and can be spur pruned to reduce production costs associated with cane pruning and bunch removal.

Compared with cane pruning, spur pruning accelerates flowering, berry development and ripening and produces larger natural berries. However cane pruning produces a looser bunch which may be preferred where large berries are produced with gibberellic acid (GA) berry sizing treatments.

In subtropical regions, such as in Carnarvon, Dormex® may be used to improve budburst.

M 44-14 requires bunch thinning and trimming, leaving 5-7 laterals, and removal of non-fruitful shoots to reduce canopy density.

Management practices to optimise fruit quality of M 44-14 are being refined. To date good results have been achieved with the use of GA at 2ppm for berry thinning and to stretch the rachis. Higher levels of GA cause excessive berry shatter and development of straggly bunches with small, 'shot' berries.

For berry sizing, studies have shown good results with 2-8ppm GA applied when the berries were 4-7mm in diameter in combination with 1.5-4.5ppm Sitofex® applied 10 days later. In highly managed vineyards, this should produce crisp berries which are between 6 and 10g and have a diameter of 20-25mm and a length of 25-30mm.

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It should be noted that fruitfulness in the following season may be reduced when high levels of GA are used (i.e. > 30 ppm).

While the variety has generally performed well under most conditions, some production problems have been noted. These include susceptibility to heat stress when berries are 12-15mm in diameter producing 'wind suck symptoms' near the top of the berry; development of scar tissue during the early stages of berry

development which may be associated with the presence of thrips during flowering or with various forms of spray damage; some susceptibility to rain damage; development of brown berries associated with excessive sun exposure or rubbing during berry development; some susceptibility to powdery mildew and downy mildew requiring good disease control practices; development of excessive phenolic characters leading to reduced palatability and consumer acceptance with very large berries, i.e. > 8 g associated with all treatments producing larger berries; and high acid retention at maturity.

Availability

Australian table grape growers seeking order forms for the variety are invited to contact the national commercialiser of CSIRO table grape varieties, Table Grapes Western Australia (TGWA). Contact Allan Price, by phone: 0429 925 499 or e-mail: aprice@bordernet.com.au.

For further information in regard to the performance of M 44-14 contact Peter Clingeffer: (08) 8303 8721 or e-mail: peter.clingeffer@csiro.au.

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