

Reducing premature nut drop in macadamia with N.A.A. sprays

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The Australian macadamia industry is expanding steadily and is under increasing pressure from competitors to increase volume and efficiency of production. The heavy fall of immature nuts five to six weeks after anthesis represents a substantial loss of potential yield. Sedgley (1981) showed that abscised nuts had been fertilized. Thus, under suitable conditions, it should be possible for these to be retained and develop normally. An application of 1 ppm naphthalene acetic acid (N.A.A.) to whole trees was effective in increasing nut set (Williams, 1980). Further investigations to confirm this and to determine critical times of application were carried out.

Methods

Branches bearing an average of 23 racemes were enclosed in large polythene bags and were sprayed to runoff at different times on ten replicate trees

with 1 ppm N.A.A.. Nuts were counted in mid October and early January. Whole trees were sprayed to runoff with 1 ppm, 5 ppm and 10 ppm N.A.A. (plus a control treatment) two weeks after anthesis and nut numbers counted on 4 representative branches each on 3 replicate trees. Whole tree yields of nuts were collected.

Results and Discussion

Sprays of 1 ppm N.A.A. to small groups of inflorescences at 4 and 6 weeks after anthesis were most effective in increasing both early and late nut set. These treatment times correspond to the period of greatest natural nut drop. Sprays at four and again at six weeks after anthesis were even more effective in retaining nuts on racemes in January. Kinetin at 400 ppm, either alone or in combination with the 1 ppm N.A.A. sprays, was also effective in reducing premature abscission of nuts.

All whole-tree N.A.A. treatments increased the yield of nuts although differences were not significant. Control trees produced a mean yield of 23.0 kg compared with 26.6, 25.0 and 25.8 kg from trees which received 1 ppm, 5 ppm and 10 ppm N.A.A. respectively. The corresponding total counts of nuts on sub-sample branches were 1 462, 1 341, 1 622 and 1 722 nuts in October and 390, 297, 268 and 319 nuts in the following January. Although the 5 and 10 ppm N.A.A. sprays caused trees to retain a larger number of nuts on sub-sample branches initially, the advantage over control trees was lost later in the season. If the treatments had been applied later between four and six weeks after anthesis, or if they had been supplemented by sprays at these times, retention of nuts might have been more effective. Further investigations in these areas are being carried out.

1. Sedgley, M. 1981. *Aust. J. Bot.* 29: 185-192.

2. Williams, R.R. 1980. *Aust. J. Exp. Agric. Anim. Husb.* 20: 740-742.