THE EFFECTS OF SEED PRODUCTION PRACTICES ON THE PRODUCTIVITY OF THE SUCCEEDING WARE POTATO CROP

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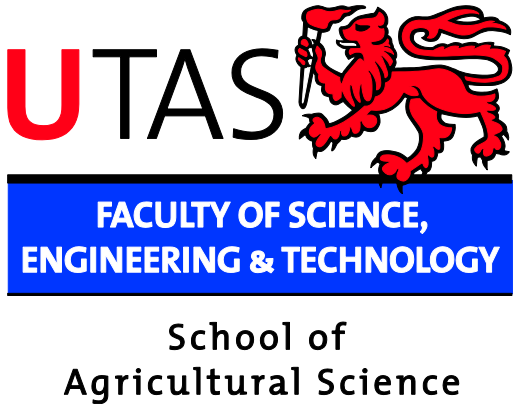

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"The Lord himself decreed that the way of the man on the land shall not be easy."

Easing the life of those who feed us is a benefit to all.

ABSTRACT

The project examined the effects of seed potato production on the performance of the seed in the following ware crop. The research was conducted in Tasmania, Australia, where the temperate maritime climate supports a lengthy growing season and a low aphid borne virus pressure permits crops to be grown to senescence, or defoliated if prevention of oversized tubers is desired. Harvest in the relatively cool autumn/winter may be delayed many weeks after skin set as soil temperatures do not fall below -1˚C often. These factors permit a greater range of seed crop management options than is present in most other seed production regions of the world. Significant variability in the performance of seed lots grown in Tasmania has been documented, and could not be accounted for by differences in storage conditions, suggesting that seed crop production conditions may be responsible. Recognition of this possibility by the potato industry in Tasmania was the impetus for this project.

Seed tubers of cultivar **Russet Burbank** produced under various nitrogen and phosphorous nutrition, and planting density treatments were found to perform in the following season without significant differences in emergence date stem number or yield. Significant seed production practice effects on seed performance were found where planting date, time of defoliation and time of harvest following defoliation treatments were imposed. The results of the study confirmed that differences in ware crop growth and yield may be at least partially attributed to seed crop management practices. Sufficient evidence was generated to support the conclusion that, under Tasmanian production conditions, planting seed crops early in the season and defoliating prior to full crop maturity along with harvesting shortly after defoliation will increase the likelihood of producing seed tubers with higher productivity in the following season.

The seed performance responses found following seed crop defoliation date treatments were not consistent, ranging from no differences between defoliated and non-defoliated treatments to ten percent differences in yield. It was

concluded that the stage of development or physiological status of the plant at the time of defoliation determines the effect on seed physiological status at harvest. In addition, significant differences in seed performance were noted between seed harvested shortly after defoliation and seed harvested after extended storage in the soil following defoliation. The behaviour of in ground stored seed following the stress associated with defoliation suggested that recovery from stress may be possible during seed development even when stems are removed. This capacity for recovery may explain differences in seed tuber responses between studies examining effects of early defoliation treatments.

The effect of seed production practices in seed physiological quality was shown to be complex, but with increasing importance placed in ware crop production on attaining consistent high yields of tubers in narrow size ranges, the capacity to manage seed physiological quality is very relevant to the potato industry.

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