Chapter 5

Conclusions

The applies *in vitro* techniques to produced doubled haploid were successful by combining anther culture, doubling chromosome and hormone shock techniques. It was also the satisfactory result because it could improve higher viability rate, reduce time comsuming and cost of production. The caulogenesis inducement was the most efficient in LS media supplemented with 10 μM KNO_3 + 2 mg/L of 2,4-D + 2 mg/L of NAA + 20% coconut water + 1 mg/L of activated charcoal. On the other hand, LS media supplemented with On the other hand, LS media supplemented with 10 μM KNO_3 + 2 mg/L of 2,4-D + 2 mg/L of NAA promotes organogenesis (plantlets) both F1 and H1 anther culture. Combination *in vitro* techniques between hormone shock for induced embryogenic development and doubling chromosome to produce double haploid were the most efficient in LS media supplemented with 0.2 g/L colchicine and 100 μM 2,4-D . It could induce high rate of viable double haploid embryoid over 70% in 6 weeks. The synthetic seeds which encapsulated in 3% sodium alginate and 0.2 mg/l benomyl could growth from embryo to normal plant and produced normal seeds after 60 days. More than 90% of encapsulated embryoid germinated in 1 weeks, both on the aseptic and non-aseptic substrata. For germplasm, Synthetic seeds can storage more than 8 weeks at 5 ºC in

the darkness. Germination rate still higher than 80% and no contamination during storage.

Despite considerable research input into artificial seed production, several major problems remain with regard to its commercialization. The first requirement for the practical application of the artificial seed technology is the large-scale production of high quality micropropagules, which is at present a major limiting factor. Additional factors responsible for poor germination of synthetic seeds are the lack of supply of nutrients and oxygen, microbial invasion and mechanical damage of somatic embryos. In fact, conversion is the most important aspect of the synseed technology, and still remains one of the factors limiting commercial application of this technology. Until recently, most reports on somatic embryogenesis focused only on the production of embryos and recovery of a few plants. The desiccation process, which damages the embryo, and other problems associated with desiccated artificial seeds need resolution. Occurrence of high levels of somaclonal variations in tissue culture is another aspect to be considered seriously while recommending the use of artificial seeds for clonal.