

serted on vine trunks from 1 to 3 inches in diameter. Over 3 inches in diameter 3 to 4 buds should be used. It is not recommended to bud over old vines which are more than 4" in diameter.

A word of caution is made for persons starting to use these methods. They should try it on a small scale until they become familiar with what to expect, how the buds grow, how fast the shoots grow and the time that is needed to properly train the shoots during this first year.

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#### GERMINATION OF HARD-TO-START XEROPHYTE SEEDS

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Problems in germinating the seed of many species of xerophytic plants (representing the Cactaceae and other plant families) have been noted; possible explanations for these include initially low or rapidly declining viability, mechanical resistance of seed coats to imbibition or subsequent emergence of the seedling, or chemically caused dormancies, among which are inhibitors in seed coats or in embryos.

Seeds of 14 species of xerophytic, succulent plants representing the Cactaceae, Euphorbiaceae, Dioscoreaceae, Passif-

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loraceae and Vitaceae were given combinations of various pre-treatments including the following:

- 1) 24-hour soak in 200 ppm gibberellic acid solution
- 2) 3-minute soak in 0.1% thiourea solution
- 3) hot water soak
- 4) mechanical scarification
- 5) leaching for 24-36 hours

Also used was a post-planting treatment, namely complete darkness surrounding the seed flats during the germination period.

The seeds were planted using randomized complete block design and germination was monitored. No significant results were noted for 13 of the 14 species, but darkness significantly promoted germination of *Dioscorea elephantipes* (Dioscoreaceae). No seeds of this species germinated in the light, while 35% were observed to germinate within 13 days in darkness. Of the seeds planted in darkness, a three-minute soak in 0.1% thiourea solution gave significantly better germination at the 5% level than the control or the 24-hour soak in 200 ppm gibberellic acid. Further work must be done to determine optimum concentrations and durations of the thiourea and GA soak. Also, related species should be tested and the possible influence of the phytochrome system in this process evaluated.