

Resource Notes

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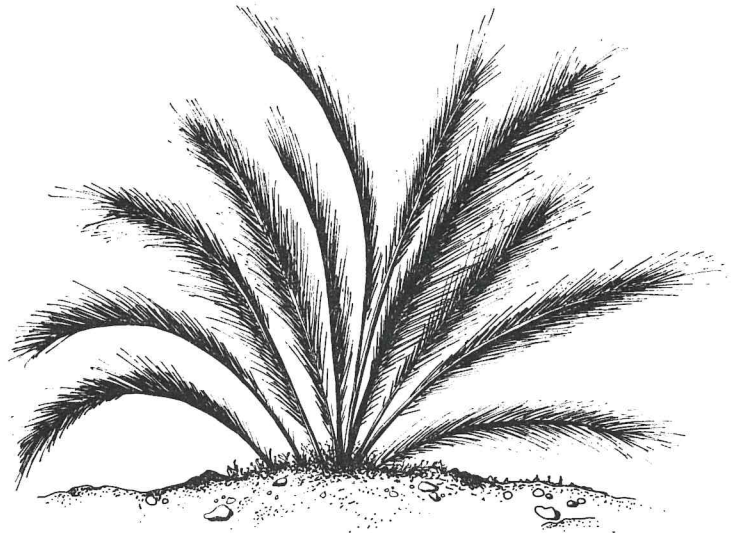
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SEED DISPERSAL IN MACROZAMIA

Macrozamia riedlei, usually called macrozamia, zamia, or sometimes zamia palm, is a south-western Australian plant which is well adapted for seed dispersal by animals. Macrozamia, though palm-like, is not a palm at all - it is more closely related to pine trees than to palms. Related species grow in many other parts of Australia, and in other parts of the world.

Female plants produce large cones (strobili) just above the ground in late summer and autumn. As the cones mature, they fall apart and the seeds drop to the ground. This is the simplest form of seed dispersal - by gravity. As macrozamia seeds are large and heavy (5 cm long, 40 g fresh weight) they are not blown around by the wind, and as the landscape where these plants live is generally rather flat, the seeds tend not to roll away. Thus, all seeds fall within 40 cm of the base of the parent plant.

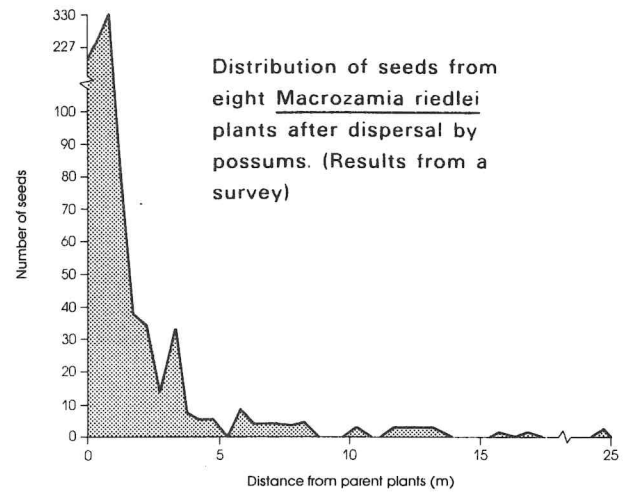
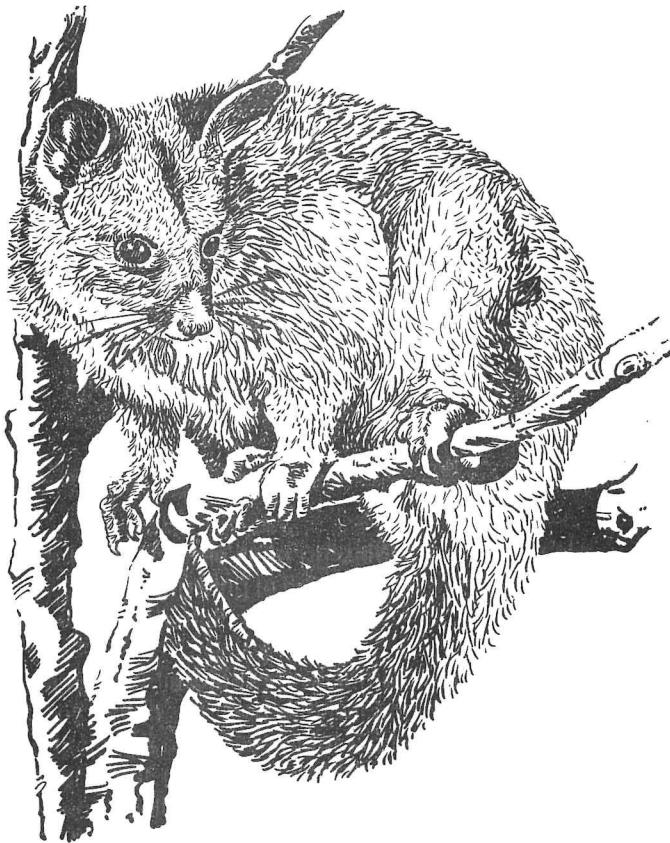
In many other species of plants a pile of seeds is an easy and attractive target for seed predators such as some weevils. Even if some of the seeds



were to survive the seed predators and germinate, they may be growing in competition with the parent and even with each other.

Macrozamia seeds show some interesting adaptations which aid seed survival and dispersal. The seeds have a red fleshy outer coat covering a much harder inner part. The hard central part contains the seed itself and around the seed, just inside the hard layer, is a very thin layer containing a substance (macrozamin) which is highly poisonous to humans and other mammals.

The hard layer and the poisonous layer function as deterrents to seed predators. The outer fleshy part, however, is much sought after for food by possums and other animals. The possums often pick up the seeds, or even pull them out of a ripe cone and carry them several metres from the parent plant before eating the fleshy layer. Sometimes they even carry seeds up trees but, needless to say, this does



not help the macrozamia unless the seed is dropped to the ground again. Most seeds are carried beyond the edge of the parent plant and are scattered (see Figure), therefore reducing the likelihood of predation or competition. Dispersal, even over these relatively small distances, may also result in the seed being deposited in a new site suitable for colonization.

A number of other mammals and birds feed on the fleshy outer layer of macrozamia seeds. These include kangaroos, wallabies, silvereyes and emus. The silvereyes are such small birds that they probably do not move the seeds at all. On the other hand, emus swallow the seeds whole. They digest away the fleshy layer, but the underlying hard layer is untouched and so the remainder of the seed passes right through the bird unharmed.

By this time, the emu may be hundreds of metres from the parent plant. This is much further than the possums carry them. Emus, therefore, contribute to long range seed dispersal, assisting in cross breeding both within and between populations of macrozamas.

Written by Allan Burbidge, ecologist with the Wildlife Research Centre, CALM.
