

Wind assisted dispersal of seeds not adapted for flight

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Summary Fortuitous dispersal of invasive plant seeds over a longer than 'normal' distance can be catastrophic for management programmes. It is often assumed that only seeds with morphological adaptations for flight are capable of distance dispersal and those not adapted for such will disperse in close proximity to the parent plant. However, the mapped distribution of an invasive legume, *Lupinus arboreus* Sims, on a dune system in New Zealand suggested the prevailing wind was facilitating sporadic distance dispersal. The role of wind in phase I and II dispersal of these non-wind adapted seeds was examined. Phase I was examined through the placement of seed traps around three mature individual plants; wind speed and direction was recorded on the dunes during the period of seed expulsion. Phase II, rolling, was examined in a wind tunnel where seeds of known weight and

sphericity were placed on one of five surfaces, and the wind speed that initiated rolling was recorded.

More than 80% of the seed dispersed at phase I accumulated within half a metre of the canopy edge, less than 30% of the seed produced was expelled via phase I with no strong evidence of wind assisted dispersal. Transportation of seed via rolling occurred on all surfaces, but the wind speed to initiate rolling increased with increasing surface roughness, and the presence of obstacles prevented rolling. Perpendicular orientation of the seed to the wind increased the likelihood of phase II dispersal, and sphericity appeared to be more important than seed weight. Under the right conditions seed not adapted for flight can travel longer distances.

Keywords Wind dispersal, non-wind adapted seeds, sphericity, surface roughness.