THE BIOLOGY AND CONTROL OF *EHRHARTA VILLOSA*, SOUTH AFRICAN PYPGRASS.

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ABSTRACT

The biology of an adventive weed, *Ehrharta villosa* (F. Schult) was investigated at Turakina beach, Rangitikei, in order to understand its means of spread and to discover a way of controlling the plant. Two populations have been found at Turakina, the smaller being on the dune system and the other in a nearby pine plantation.

Studies of the seed biology showed that although viability was high (ca. 80%), the numbers of seed produced per m^2 was low (8 to 102 seeds/m^2). Dispersal of these seeds was limited to within 5m of the source population and no seeds were discovered in the soil seed bank. Circumstantial evidence suggests seed predation to be a contributing factor to this. Germination tests in sand showed seeds were capable of emerging from depths of up to 6cm.

Stages in seedling development were described. Pypgrass displays a tall habit with internodes which elongate soon after germination, but its seedlings are less vigorous than most other grasses and weeds. The morphology and growth pattern of pypgrass allows it to have a smothering effect on other vegetation.

The potential for vegetative spread by rhizome fragments was investigated by burial and reexcavation of fragments. Pypgrass is capable of reproduction from rhizome fragments of varying lengths. Mapping a 400m^2 area of the advancing front of one population showed that over one year pypgrass had spread between 4.1 and 9.0m. Species associated with pypgrass were recorded at

the beginning and the end of the study to give some indication of the effect of pypgrass density on those associated species. In quadrats where pypgrass was most dense, fewer species overall were found.

Dune species including pypgrass were tested for the presence of mycorrhizal fungi. Pypgrass proved to have the greatest percentage mycorrhizal infection (88.9%) with the other species having significantly lower percent infection. Mycorrhizal association may give an advantage to pypgrass by allowing greater uptake of water and minerals compared with other plants.

Leaf anatomical studies confirmed pypgrass is a C3 plant and other features such as sunken stomata and inrolled leaves may be of adaptive value in a coastal dune habitat.

Different methods for control of pypgrass were considered and it was decided that herbicide was the best option, because of the large area involved and the nature of the underground rhizomes. Field trials were used to evaluate haloxyfop for control of pypgrass. A single application did not completely control pypgrass, regardless of time of application. Two, split, applications also did not achieve complete control of leaf and rhizome, however split applications ensured tiller regeneration remained low throughout the trial.

Haloxyfop can generally be used selectively among dicotyledonous plants and monocotyledons that are not in the family Poaceae, but

it can harm some of these monocotyledons. Pot trials on dune monocotyledons associated with pypgrass demonstrated that marram was the only species significantly affected by haloxyfop, and even this plant was not completely killed. The trial established that haloxyfop would not adversely affect any native monocotyledonous plants growing in the area of pypgrass.

This study has gathered the necessary information to decide on a course of action. Pypgrass is at present confined to the Turakina area in two discrete populations. Use of herbicide (haloxyfop) in a number of split applications would prevent regrowth from rhizomes. Regeneration of pypgrass by seed after herbicidal control is not likely, allowing eradication to be an achievable aim.

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