

Weed matting options for control of submerged aquatic plants

Alien submerged aquatic plants have a history of successful invasion in New Zealand's lakes and waterways. For new or relatively small incursions in a waterbody, weed matting can be a useful tool for controlling and/or eradicating submerged aquatic weeds. This paper explores weed matting use to date, and evaluates the use of natural weed matting products for weed control and native plant survival.

Experience

Research

Know how

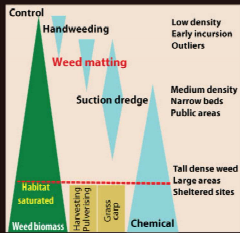


Figure 1: Weed matting is a useful tool for controlling low density early incursions of rooted aquatic plants (drawing: Clayton).



Photo 1: Weed can grow through sites made for deoxygenating or between matted seams, as seen with *Hydrilla verticillata* in Lake Opouahi (photo: Wells).

Concept: Weed matting can be used to exclude light and prevent weed growth (Figure 1). Its successful use depends on choice of product, weed issues, management objectives and site suitability, including gradient and wave action.

Product choice: Factors to consider include density for optimal light exclusion, buoyancy or weight for ease of placement/removal, anchorage system, and gas release (photo 1 *Hydrilla* in Lake Opouahi).

Site Factors: For example, sheltered sites may facilitate matting placement, but could also allow sediment to settle readily on the weed mat creating new habitat for plant growth (photos 2, 3 and 4).

Biodegradable geotextile is successfully used in Ireland to control *Lagarosiphon major* (Caffrey et al., 2009).



The geotextile that was used (photo: Caffrey).



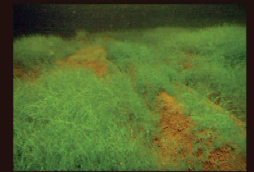
4 weeks after placement of geotextile (photo: Joe Caffrey).



Newly emerging *Nitzschia* after 8 weeks (photo: Joe Caffrey).



Healthy Charophyte vegetation within 16 weeks (photo: Joe Caffrey).



Charophyte meadow on geotextile after 8 months (photo: Caffrey).

Can do

Approach: A variety of approaches can be used to suit different habitats. For example, weed mat has been used in Lake Wanaka to control patches of *Lagarosiphon major* (photo 5) and a patch of *Hydrilla* at the Lake Opouahi jetty.



Photo 2: *Elodea canadensis* colonies silt covered weed matting in Lake Opouahi (photo: Clayton).



Photo 3: Native Charophytes (foreground) have colonised the silt covered weed mat used to control *Hydrilla verticillata* in Lake Opouahi (photo: Wells).



Photo 4: *Elodea canadensis* colonies silt covered weed matting in Lake Wanaka (photo: John Clayton).

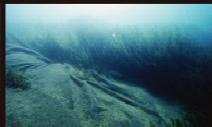


Photo 5: A patch of *Lag major* is controlled amidst *Elodea canadensis* in L. Wanaka. This patch was too low in density to spray and too large for hand weeding (photo: Clayton).

Experimental testing for selective weed control using:

- 3 biodegradable products; two densities of hessian and a coconut fibre.
- 4 invasive weeds; *Lagarosiphon major*, *Ceratophyllum demersum*, *Hydrilla verticillata* and *Egeria densa*.
- 4 native plants; Charophytes (plants and oospore rich mud), *Myriophyllum triphyllum* and *Potamogeton ochreatus*.
- Multiple pots for sequential destructive harvest (Photo 8).



Photo 8: Experimental pots.

Job done

Field success: When *Lagarosiphon major* was found in Rosie Bay in Lake Waikaremoana, the Department of Conservation used weed matting and hand weeding in an integrated approach to achieve eradication (photo 6).



Photo 6: Weed matting smothered the *Lagarosiphon major* (left) alongside native macrophytes (right) in Rosie Bay (photo: Wells).

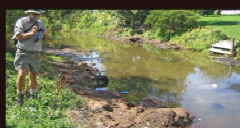
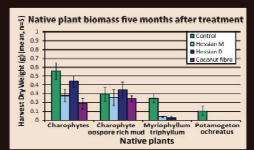
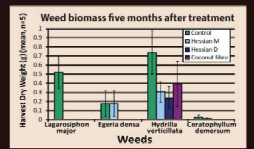


Photo 7: Successful removal of *Lagarosiphon major* (photo: Clayton).

To control *Lagarosiphon major* in a Takaka stream the Tasman District Council used weed matting, suspended above the water to exclude light and enable water flow underneath (photo 7).

Research success:

- Selective weed control was achieved.
- Native species with narrower stems compared with some invasive species, were able to grow through all of the products e.g., Charophytes compared with *Lagarosiphon major* or *Egeria densa*.
- Porous products are water and gas permeable, therefore easier to lay, and unlikely to trap gas that will potentially lift the matting, or require cutting that may provide light gaps for weeds.



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