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Hydrosprigging for effective rehabilitation of existing poor quality turf

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Introduction

Hydrosprigging was derived from hydroseeding/hydraulic planting where seeds are used instead of live sprigs. Hydraulic planting has the ability to quickly and evenly plant seeded grasses, wildflowers and a wide variety of erosion control plants. Hydrosprigging is a planting method that utilizes a slurry of mulch, grass sprigs, fertilizer, tackifier, dye (optional) and water. The slurry is usually sprayed onto surfaces using a hose pipe under high pressure. Hydrosprigging is widely used for turf planting in golf courses, road sides and on slopes where there is a significant risk of erosion occurring during the period of initial turf establishment. It has been found to be an effective method for cowgrass planting in Singapore.

Hydrosprigging for effective turf rehabilitation

Apart from new turf installations, hydrosprigging can also rehabilitate poor quality turf. The existing site will need to be assessed and prepared for better establishment of the slurry. This includes the removal of weeds and loosening of soil. If the site has 70 to 80% turf density, hydromulching (all slurry components included except turf sprigs) alone can improve the turf quality and density. If, however, the site has very poor turf density, hydrosprigging has to be followed. Existing turf can be rehabilitated simply using hydrosprigging without much disturbance to the existing site or landscape.

Fig 1. Hydrosprigging to rehabilitate poor quality turf.

Research on hydrosprigging

CUGE Research has tested the efficacy of hydrosprigging for turf rehabilitation. Three existing slopes with turf were identified in the Tai Keng Garden playground and utilized for this study. The site was assessed to be poor in turf quality, being low in turf density and high in weed percentage (more than 50 %). Experimental plots of dimension 3m x 2m were marked out on the slopes. Both the treatments (control and hydrosprigging) were replicated four times. To prepare for hydrosprigging, weeds were removed and the soil was loosened in order to facilitate better establishment (**Fig 2**). Any existing cowgrass was retained. The turf sprigs were first spread manually over the bare patches. This was followed by hydrosprigging application using a Bowie 300 hydromulcher. Wood fibre mulch (Terramatrix) was used in the hydrosprigging slurry. The slurry composition for cowgrass used in this study is given in **Table 1**. For the control plot, there was no intervention and neither weeding nor soil loosening was carried out.

Subsequently, the plots, including the control, were fertilized once a month using a turf fertilizer (4:1:2 NPK) at the rate of 0.2 kg N/100m^2/month. The parameters measured during the five-month study period were: turf quality, turf cover percentage, chlorophyll content and weed cover percentage. Turf quality was visually assessed considering the four key components (colour, density, uniformity and texture) on a scale of 1 to 9, with 6 representing minimally acceptable turf and 1 representing dead turf.

Table 1 Application rate followed in this study:

Mulch type	Slurry composition for 1000 m^2
Wood fibre mulch (Terramatrix)	Turfgrass sprigs /sod (400 m^2) + mulch (250 kg) + fertilizer (6 kg) + water (4000 l)

Fig 2.
a) Experimental plots with existing cowgrass after weeding and soil loosening.

b) Original plots (control) with existing weeds and low density cowgrass.

Fig 3.
a) Experimental plots after 2 months following hydrosprigging.

b) Original plots (control) with existing weeds and low density cowgrass after 2 months following project initiation (areas within the red borders show high weed invasion).

Results

Based on the observations, hydrosprigging appeared to be an effective method of turf rehabilitation. The major advantages of hydrosprigging are enhanced turf quality and time saving. The control plots had higher weed invasion (>70 %) and had lower turf quality (< 6) compared to the hydrosprigged plots (**Fig 3**). Added mulch and fertilizer improved the soil status and enhanced both existing turf and hydrosprigged turf.

Application

The establishment period for cowgrass was two to three months depending on the sprig rate and also the level of maintenance. The recommended application rate for cowgrass is given in **Table 2** below.

Table 2 Application rate followed in this study:

Mulch type	Slurry composition for 1000 m^2
Coco peat/ Wood fibre mulch (Terramatrix)	Turfgrass sprigs/sod (500 m^2) + coco peat mulch (300 kg) + tackifier (8 kg) (not applicable for Terramatrix) + fertilizer (6 kg) + water (4000 l)

Steps recommended for effective hydrosprigging and maintenance

- Site must be free of weeds before hydrosprigging
- Good quality ASM* with well matured compost free of weeds must be used
- Turf sprigs/sod must be washed free of soil, especially clay particles
- Watering must be done at least once in three days after hydrosprigging to maintain soil moisture for about four to six weeks or until establishment
- Monthly fertilizer application, using a proper turf fertilizer, must be followed one month after hydrosprigging
- Grass cutting must be restricted for the first two months to facilitate growth, especially on slopes
- Both human and vehicle traffic must be avoided on the applied site until the complete establishment of turfgrasses

Note: For more information, please refer the Research Technical Notes on 'Hydrosprigging for effective turf establishment of cowgrass'.

*ASM - NParks' approved soil mix with matured compost