

Hydrosprigging for Effective Establishment of Cowgrass

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Introduction

Vegetative propagation of turf has always been popular because of its quick establishment. The methods include sodding, plugging, close turfing, sprigging and hydro-sprigging. Each has its advantages and disadvantages. Hydro-sprigging has been in practice for more than 50 years in countries like USA and Australia. It is productive in terms of cost and time savings.

Hydro-sprigging

Hydro-sprigging is 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, wild-flowers and a wide variety of erosion control plants. It 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. Hydro-sprigging is widely used for turf planting in golf courses, road sides and on slopes where there is a significant risk of erosion during initial turf establishment.



Fig. 1 Hydromulcher Machine – Bowie 300 (top) and Hydro-sprigging application using coco peat mulch slurry (bottom)



Slurry Components

The major slurry components include mulch, turfgrass sprigs, fertilizer, tackifier, and water. In addition to these ingredients, other additives used to stimulate and sustain growth of turfgrasses can also be used.

Commonly used mulches are either from wood fibre or paper. The main role of the mulch is to hold moisture, act as substrate, protect the sprigs and improve the soil quality through their breakdown. Based on availability and cost, any kind of cellulose rich mulch can be evaluated and incorporated. Common cellulose rich mulches include coco peat, sugarcane bagasse and paddy straw. The mulch particle size must not exceed 17 mm (diameter). Otherwise, the spray nozzle will be clogged.

Grass sprigs are live stolons and rhizomes that are harvested and processed in order to achieve the desired size (mm diameter) in order to pass through the spray nozzle. The sprigs can either be mixed in the slurry and applied, or be spread over the soil followed by the slurry (excluding sprigs) application. Nutrient demand is fulfilled by adding a starter fertilizer (NPK – 1:2:1) at the recommended dosage.

Tackifiers or tackifying agents are horticultural glue that can bind the various compounds of the slurry and enable it to 'stick' to the soil. It prevents the slurry from being washed away from the soil. One of the most commonly used organic tackifier is Guar gum which is extracted from the seeds of cluster beans (*Cyamopsis tetragonolobus*).



Fig. 2 Wood fibre mulch slurry - Terramatrix (left) and Coco peat mulch slurry (right)

Advantages of Hydrostrigging over conventional Turfgrass Planting Methods

Hydrostrigging has a number of advantages over the conventional planting methods like sodding and close turfing. These advantages include, time saving, labour saving, increased productivity, quality that is unaffected by terrain, soil moisture or obstacles, even planting with higher survivability and lower cost.

Research on Hydrostrigging

CUGE Research has tested the efficacy of hydrostrigging in Singapore. Cowgrass was hydrostrigged on three different slopes using two different mulches. The three different slope angles include 0° (flat land), 30° and 50°. The root zone medium used was NParks' Approved Soil Mix (ASM). The two mulches used were coco peat and wood fibre mulch (Terramatrix – commercial name).

The study was conducted at a state land in Lorong Chencharu, Sembawang. 30° and 50° slopes were artificially created using ASM. The turf sprigs were spread manually over the soil before application instead of mixing into the slurry which is another version of hydrostrigging. The application was done using a Bowie 300 hydromulcher. Turf quality, percentage turf cover, chlorophyll content and Dark Green Colour Index (DGCI) were recorded and compared with close turfing method. The study period was six months.

Table 1.1 Application rate used in the study

Mulch type	Slurry composition for 1000 m ²
Coco peat	Turfgrass sprigs /sod (300 m ²) + mulch (280 kg) + tackifier (8 kg) + fertilizer (6 kg) + water (4000 l)
Terramatrix	Turfgrass sprigs /sod (300 m ²) + mulch (250 kg) + fertilizer (6kg) + water (4000 l)



Fig. 3 Experimental plots after one week of hydrostrigging application using both coco peat slurry (brown) and Terramatrix mulch slurry (green)



Fig. 4 Experimental plots after 10 weeks of hydrostrigging application

Application

Based on the study, hydrostrigging has proven to be an effective method of turf planting, especially on slopes. Its major advantages over the conventional close turfing are enhanced turf quality, time saving and cost saving. Turf quality was better compared to close turfing. The planting time was significantly reduced through hydrostrigging. Hydrostrigging saved 15-20 % of total planting cost compared to close turfing as it requires lesser sod material and labour. In addition to cost saving, the major advantages of hydrostrigging are increased landscape productivity and enhanced turf quality. Hydrostrigging also helped to prevent soil erosion as the mulch with the tackifier stick on to soil surface and remain intact for around two months even under heavy rainfall.

Cowgrass performed well when planted by hydrostrigging method. The establishment period for Cowgrass is two to three months depending on the sprig rate and the level of maintenance. The recommended application rate for Cowgrass is given in table below. Further studies on the efficacy of hydrostrigging using different grasses such as seashore paspalum, St. Augustinegrass and Manilagrass and the effects of biostimulants are being planned.

Table 1.2 Recommended application rate used in the study

Mulch type	Slurry composition for 1000 m ²
Coco peat / Wood fibre Mulch (Terramatrix)	Turfgrass sprigs /sod (500 m ²) + mulch (300 kg) + tackifier (8 kg [NA to Terramatrix]) + fertilizer (6 kg) + water (4000 l)

Notes for Effective Hydrostrigging and Maintenance:

- Site must be free of weeds before hydrostrigging
- 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 hydrostrigging to maintain soil moisture for about four to six weeks or until establishment
- Monthly fertilizer application must be followed one month after hydrostrigging using a proper turf fertilizer
- 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 complete establishment of turfgrasses