

Cultural Control of Established Dandelion in Turf

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Introduction

Dandelion can be a major weed problem in turf. It forms dense clumps which affects the footing and the overall playability of sports fields and golf courses. The texture and colour of its leaves does not blend harmoniously with the surrounding grasses. When in bloom, its yellow flowers are yet a further detractor from the aesthetics of the turf.

Dandelion seed is spread on the wind, and as this seed can be carried great distances, prevention of new infestations is difficult. Once a dandelion becomes established and supported by its large taproot, they are even harder to control.

The foundation of cultural dandelion control in turf has always been to create a growing environment in which the turf has the competitive vigor to repel the establishment of new dandelion seedlings. However, when it comes to dealing with established dandelion, many of the cultural methods are abandoned, opting to solely rely on chemical control. As concerns over the use of herbicides for aesthetic purposes increases, the turf manager must explore new strategies and rethink the whole dandelion control process.

In a previous study conducted by the Prairie Turfgrass Research Centre, mowing various species of grasses at a higher height was thought to reduce weed populations. A number of grasses resisted the development of weeds when mowed at 3" and there was virtually no weed development over the duration of the study.

Aeration and topdressing are cultural practices that improve gas diffusion in soil which in turn helps to promote root growth. In addition, aeration physically removes thatch from the turf which also helps to improve the turf quality.

High quality turf as promoted by adequate fertility has also shown to reduce weed infestations. In addition, the two organic fertilizers, soybean and corn gluten meal, have shown to have weed suppression properties.

This study was developed to determine the effects of various cultural strategies for the control of dandelion in turf.

Methodology

The effect of three cultural turf management practices on an established dandelion population was tested at the Prairie Turfgrass Research Centre on a site located at Olds College, Olds, Alberta.

Two weeks prior to the establishment of the trial (July 8), a pretrial treatment of the herbicide Trillion was applied to the site in an attempt to suppress the dandelion infestation. Seven days after the herbicide had been applied the level of control was visually assessed.

On June 22nd the trial was established over the pretreated area and the location of each plot was identified and staked to allow for future reference. Test plots that measured 1x 1 metres were laid out on a turf site with a uniform stand of established dandelion. Each treatment was replicated four times within a three factor randomized complete block design (Table1).

To determine if soil aeration was a factor to consider when controlling established dandelions, half of the plots were aerified, while the other half was left untreated. A Ryan GA30 aerator, equipped with 5/8" hollow tines and set for a 3" x 3" spacing, was used to effectively open up the turf. The soil cores were harvested and removed from the site. USGA specification sand was spread over the aerified turf. Several passes with a drag mat were made to fill the core holes and to evenly distribute the sand over the aerated area.

The second factor evaluated the effect of fertility on weed control. The individual fertilizers were weighed into plot sized lots and applied by hand using a simple shaker bottle. The plots received the initial application of fertilizer on the establishment date and a second application of the fertilizer was applied four weeks later.

The mowing treatments were conducted on a weekly basis. This process was accomplished by first mowing the entire experimental area at the higher cutting height of 2½" (6.25cm), then using a push mower, selectively re-cut specific plots at the lower height of ¾" (1.9cm).

Table 1 – List of cultural control factors for weed control in turf, 2005.

| Mowing Height | | | | |
|------------------------------|--------------------------------|-----------------|---------------------------------------|------------------------|
| | <i>Height of Cut</i> | | | |
| High mowing height | 6.25cm (2½") | | | |
| Low mowing height | 1.9cm (¾") | | | |
| Turf Aeration | | | | |
| | <i>Aeration Specifications</i> | | | |
| Soil cored and top dressed | 5/8" tines, 3"x3" spacing | | Top dressing: USGA specification sand | |
| Untreated (not cored) | | | | |
| Fertilizer Treatments | | | | |
| | <i>Product</i> | <i>Analysis</i> | <i>Nitrogen Source</i> | <i>Rate(s)</i> |
| Corn gluten | Turf Maize Pro | 10-0-0 | Corn gluten meal | 97g/100m ² |
| | | | | 194g/100m ² |
| Soybean meal | Unifeed Soybean meal | 7.5-0-0 | Dehulled soybean meal | 100g/100m ² |
| | | | | 200g/100m ² |
| Controlled release synthetic | Scotts Contec 8311 | 21-3-11 | Methylene urea | 83g/100m ² |
| | | | | 166g/100m ² |
| Untreated control | No fertilizer | | | |

On August 31st the trial was evaluated for the first time. The dandelions in each of the one square metre plots were physically counted. In addition the plots were visually evaluated for overall turf quality. Following National Turfgrass Evaluation Program (NTEP) protocols, three turf quality factors: colour, density and area cover were assessed.

The colour factor subjectively evaluated the uniformity and intensity of the colour displayed by the turf. A 1 to 9 scale was used to rate each plot. Treatments which stimulated a uniform dark

green colour received scores ranging from 6 for an acceptable colour to 9 for turf with outstanding colour. Plots that produced a lighter turf colour were scored lower.

Density, the second quality factor, was subjectively evaluated for the impact of the treatments on the turf to produce more shoots and tillers. The 1 to 9 scale was again used to rate each plot. Treatments which stimulated a tightly knit turf received scores ranging from 6 for an acceptable density to 9 for superior turf. Treatments associated with a weak or thin turf stand were scored lower.

The final quality factor, area cover, subjectively evaluated the vigor of turf. Once again a 1 to 9 scale was used to rate each plot. Treatments which stimulated a thick competitive turf cover received scores ranging from 6 for an acceptable area cover to 9 for a superior area cover. Treatments producing a weak turf, affected by weed encroachment and/or the presence of bare patches, were scored lower.

Results

Herbicide pretreatment

Seven days after the herbicide had been applied the level of control was visually assessed. Classic signs of herbicide damage were evident throughout the trial site as the top growth of the dandelions appeared twisted and some upper leaves were beginning to turn brown. At this point, good control was expected. However, as dandelions counts ranged from 22-29 dandelions per m² on the August 29 rating date, effective control was questioned.

Mowing Height

An analysis of the data indicates that there was no statistical difference in the dandelion population when the two mowing heights were compared (Table 2).

Even though the turf mowed at the higher height scored better than the turf mowed at the lower height for colour, density and area cover, it was not statistically different than the turf that was mowed at a lower height (Table 2).

Turf Aeration

At the ninety percent confidence level the turf which was cored and top dressed had a significantly higher number of dandelions per square metre than the non-aerated turf (Table 2).

The turf colour and turf density of the non-aerated turf was significantly better from that of the aerated turf. There were no significant differences between the treatments for area cover (Table 2).

Fertilizer

At the ninety percent confidence level the high rate of the controlled release synthetic fertilizer had fewer dandelions per square metre than the other fertilizer treatments (Table 2).

The turf colour stimulated by the high rates of the corn gluten and the controlled release synthetic was significantly better than the turf colour of the unfertilized treatment and the lower rates of either the soybean meal or the controlled release synthetic fertilizer (Table 2).

There was no difference between treatments for area cover (Table 2).

Table 2- Dandelion counts and turf quality ratings, August, 2005.

| | | Dandelions per sq.metre | Turf Colour | Turf Density | Turf Area Cover |
|------------------------------|------------------------|----------------------------|----------------|-----------------|--------------------|
| | | ————— 1-9 scale ————— | | | |
| Mowing Height | | | | | |
| High height | 6.25cm (2 1/2") | 25a | 6.1a | 5.2a | 5.6a |
| Low height | 1.88cm (3/4") | 26a | 5.4a | 4.8a | 5.5a |
| Turf Aeration | | | | | |
| Soil cored and top dressed | | 29b | 5.6b | 4.9b | 5.5a |
| Untreated not cored | | 22a | 5.9a | 5.1a | 5.6a |
| Fertilizer | | | | | |
| Corn gluten | 97g/100m ² | 26b | 5.8bc | 4.9c | 5.6a |
| Corn gluten | 197g/100m ² | 26b | 5.9ab | 5.1ab | 5.6a |
| Soybean meal | 100g/100m ² | 26b | 5.6cd | 4.9c | 5.5a |
| Soybean meal | 200g/100m ² | 27b | 5.8bc | 5.1ab | 5.5a |
| Controlled release synthetic | 83g/100m ² | 26b | 5.6cd | 5.0bc | 5.6a |
| Controlled release synthetic | 166g/100m ² | 22a | 6.1a | 5.2a | 5.6a |
| No fertilizer | | 27b | 5.4d | 4.7d | 5.4a |
| <i>LSD</i> _{0.10} = | | 3 | 0.2 | 0.1 | n/s |

* Values that have the same letter as a suffix are not significant from each other.

Discussion

In the initial year of this study, the infestation of dandelion had remained very high. The pretrial herbicide treatment provided only short term suppression of the dandelion's top growth.

With only a single set of data points it is still unclear as to which treatments or combination of treatments will have the greatest effect on the dandelion population.