Effect of Alternative Control Products on the Reduction of Dandelion in Turf

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Summary

A number of alternative weed control products were tested at three sites throughout western Canada. Two applications of each of the products were applied in July and August, 2011. Killex 500 was the only product that gave consistent control of dandelion. At the Lethbridge site the Fiesta appeared to provide good control three weeks after the second application of product. Label recommendations state that two or more applications of this product may be necessary to achieve weed control. The non-selective herbicides and the compost did not reduce dandelion counts in these trials.

Background Information

Table 1 – Information on active ingredients and mode of action of the various products in this trial.

Product	Active Ingredient	Mode of Action
Killex 500 A selective herbicide	2,4-D mecoprop dicamba	A conventional three-way phenoxy herbicide. The herbicide mimics the natural growth hormones, and upset the plants natural hormone balance. New growth on broadleaf plants generally exhibit stem twisting and leaf malformations.
Fiesta A selective contact herbicide	Iron Chelate with hydroxyethylenediaminetriacetic acid in the form FEHEDTA	Causes oxidative stress within the plant at the cellular level that in turn causes tissue necrosis and ultimately plant death.
Finalsan A non-selective contact herbicide	Pelargonic acid also known as nonanoic acid.	Penetrates the wax layer of the leaf destroying the plants epidermis cell membranes, causing in a rapid dissolution of cell membrane integrity resulting in the dessication of foliar tissues
EcoClear A non-selective contact herbicide	A proprietary mixture of acetic and citric acids	Penetrates the wax layer of the leaf destroying the plants epidermis cell membranes, causing in a rapid dissolution of cell membrane integrity resulting in the dessication of foliar tissues.
Pelletized Compost	Decomposed organic matter	Compost is generally considered an amendment that improves the physical properties of the soil. However it can smother weeds when used as a mulch.
Corn Gluten Meal A pre-emergent herbicide	Gluten is a composite formed from several different proteins: albumins, glutelins, globulins, and prolamins.	Inhibits root formation in weeds at the time of germination. Weeds germinate and form a shoot, but no root, which prevents growth. Has been shown to be ineffective on established weeds.
Untreated Control	None	No treatment was applied.

Materials and Methods

Field trials were established in selected parks areas that had a high natural infestation of dandelion in Regina, Red Deer and Lethbridge. Plots that were 1.0 by 1.0 metres were established in a randomized complete block design with four replications. The Regina trial was initiated on July 14th followed by similar trials being established in Lethbridge on July 28th and in Red Deer on August 3rd. A second application of the following product: Fiesta, Finalsan, Ecoclear and corn gluten meal was applied to each plot five weeks after the initial treatment. The number of dandelion plants within each individual plot was determined prior to the first application of the treatments.

The liquid formulated treatments Killex 500 and Fiesta were premixed and applied at the required rates using a CO_2 research sprayer. The Finalsan spot treatment also required the preparation of a spray solution consisting 1 part Finalsan to 6 parts water. Using a spray bottle the prepared spray solution was applied to the dandelion foliage to assure that the leaf area was thoroughly wet. The other spot treatment, EcoClear, was already formulated as a ready to use spray. Again sufficient amount of the spray solution was applied to the dandelion foliage to assure that the leaf area was thoroughly wet.

The two remaining dry formulated treatments, the pelletized compost and the granular corn gluten meal, were pre-weighed and hand shaken on to the designated plots.

Five weeks after the initial application of the treatments, the level of dandelion control was evaluated at the Red Deer and Lethbridge sites. The number of dandelion plants within each individual plot were counted and evaluated for signs of control. The Red Deer and Lethbridge sites were evaluated one more time at eight weeks after the initial application of the treatments. The number of dandelion plants within each individual plot were once more counted and evaluated for signs of control.

The Regina site was evaluated only once at eleven weeks after the initial application of the treatments. The number of dandelion plants within each individual plot were counted and evaluated for signs of control.

Table 2 – List of treatments and application rates

1. Killex 500 single application at 40mls /100m^2
2. Fiesta 1:25 mix applied at 100mls/m^2
3. Fiesta 1:25 mix applied at 200mls/m^2
4. Fiesta 1:25 mix applied at 400mls/m^2
5. Fiesta 1:25 mix applied at 50mls/m^2
6. Fiesta 1:12 mix applied at 100mls/m^2
7. Fiesta 1:12 mix applied at 200mls/m^2
8. Finalsan 1:6 mix spot treatment
9. Finalsan 1:6 mix spot treatment + Corn gluten meal 100g/m^2
10. EcoClear spot treatment
11. EcoClear spot treatment + Corn gluten 100g/m^2
12. Pelletized Compost single application at 100g/m^2
13. Pelletized Compost single application at 200g/m^2

14. Corn gluten meal 100g/m^2
15. Untreated Control

Results

On both rating dates at the Red Deer site, the industry standard product, Killex 500, was significantly better than any of the other products in the test. However, it was interesting to note that on the second rating date there was a recovery in the number of dandelions in the Killex treated areas.

On the first rating date (five weeks after application), Fiesta 1:25 100ml/100m^2 and EcoClear spot treatment had significantly less dandelions than the untreated control. However, eight weeks after the initial treatment (3 weeks after the second treatment) there were no differences between these treatments and the untreated control.

On the second rating date Fiesta 1:25 50mls/m^2, Fiesta 1:25 200mls/m^2 and EcoClear spot treatment plus Corn gluten 100g/m^2 had significantly lower dandelion counts than did the untreated control. However, on the first rating date there were no statistical differences.

Table 3 - Red Deer dandelion counts, 2011.

Treatments	Initial count	5 weeks After Treatment	8 weeks After Treatment
		plants/m^2	
Killex 500 single application at 40mls /100m^2	30a	4c	12e
Fiesta 1:25 mix applied at 100mls/m^2	30a	21b	29ab
Fiesta 1:25 mix applied at 200mls/m^2	30a	26ab	24bcd
Fiesta 1:25 mix applied at 400mls/m^2	30a	27ab	25abcd
Fiesta 1:25 mix applied at 50mls/m^2	30a	25ab	21d
Fiesta 1:12 mix applied at 100mls/m^2	30a	25ab	26abcd
Fiesta 1:12 mix applied at 200mls/m^2	30a	23ab	28abc
Finalsan 1:6 mix spot treatment	30a	30a	27abcd
Finalsan 1:6 mix spot treatment + Corn gluten 100g/m^2	30a	28ab	30a
EcoClear spot treatment	30a	21b	27abcd
EcoClear spot treatment + Corn gluten 100g/m^2	30a	23ab	22cd
Pelletized Compost single application at 100g/m^2	30a	25ab	30a
Pelletized Compost single application at 200g/m^2	30a	30a	30a
Corn gluten 100g/m^2	30a	25ab	30a
Untreated Control	30a	30a	30a
$LSD_{0.05}$ =	n/s	7	5

* Numeric values followed by the same letter are not considered significantly different.

At the Lethbridge site, Fiesta 1:12 100ml/m^2 had significantly lower dandelion counts than did the untreated control on both rating dates. On the second rating date, Killex 500 40mls /100m^2 , Fiesta 1:25 200mls/m^2, Fiesta 1:25 400mls/m^2, Fiesta 1:25 50mls/m^2, Fiesta 1:12 100mls/m^2, and Fiesta 1:12 200mls/m^2 had lower dandelions counts than did the untreated control.

Table 4 - Lethbridge dandelion counts, 2011.

Treatments	Initial count	5 weeks After Treatment	8 weeks After Treatment
		plants/m^2	
Killex 500 single application at 40mls /100m^2	24a	15cd	8de
Fiesta 1:25 mix applied at 100mls/m^2	30a	27ab	14bcde
Fiesta 1:25 mix applied at 200mls/m^2	29a	18bcd	4de
Fiesta 1:25 mix applied at 400mls/m^2	30a	24abc	5de
Fiesta 1:25 mix applied at 50mls/m^2	29a	18bcd	6de
Fiesta 1:12 mix applied at 100mls/m^2	22a	11d	8de
Fiesta 1:12 mix applied at 200mls/m^2	26a	20abcd	3e
Finalsan 1:6 mix spot treatment	25a	26abc	11cde
Finalsan 1:6 mix spot treatment + Corn gluten 100g/m^2	27a	27ab	14bcde
EcoClear spot treatment	27a	30a	16abcd
EcoClear spot treatment + Corn gluten 100g/m^2	24a	21abcd	11bcde
Pelletized Compost single application at 100g/m^2	28a	28ab	28a
Pelletized Compost single application at 200g/m^2	29a	27ab	21abc
Corn gluten 100g/m^2	30a	30a	24ab
Untreated Control	23a	23abc	24ab
$LSD_{0.05}$ =	n/s	10	13

* Numeric values followed by the same letter are not considered significantly different.

There were no significant differences between treatments at the Regina site.

Table 5 - Regina dandelion counts, 2011.

Treatments	Initial count	11 weeks After Treatment
	plants/m^2	
Killex 500 single application at 40mls /100m^2	21a	12a
Fiesta 1:25 mix applied at 100mls/m^2	14a	15a
Fiesta 1:25 mix applied at 200mls/m^2	21a	14a
Fiesta 1:25 mix applied at 400mls/m^2	12a	16a
Fiesta 1:25 mix applied at 50mls/m^2	18a	18a
Fiesta 1:12 mix applied at 100mls/m^2	9a	7a
Fiesta 1:12 mix applied at 200mls/m^2	18a	17a
Finalsan 1:6 mix spot treatment	17a	25a
Finalsan 1:6 mix spot treatment + Corn gluten 100g/m^2	17a	17a
EcoClear spot treatment	19a	22a
EcoClear spot treatment + Corn gluten 100g/m^2	12a	15a
Pelletized Compost single application at 100g/m^2	16a	16a
Pelletized Compost single application at 200g/m^2	15a	22a
Corn gluten 100g/m^2	20a	26a
Untreated Control	16a	24a
$LSD_{0.05}$ =	n/s	n/s

* Numeric values followed by the same letter are not considered significantly different.