UNIVERSITY OF ILLINOIS
AT URBANA - CHAMPAIGN

Department of Crop Sciences

AW-101 Turner Hall
1102 South Goodwin Avenue
Urbana, IL 61801-4798

Effect of Hydretain Applied at Seeding for Turfgrass Establishment

S. Henning
Department of Crop Sciences
University of Illinois

Introduction

Maintaining optimum soil moisture is critical for optimal seed germination and establishment. This is particularly so for turfgrass as turf seed and seedlings are typically very small and therefore highly subject to moisture stress pre- and-post germination. Additionally, with many municipalities under watering restrictions, a product that both successfully maintains optimum soil moisture during turf seed germination and reduces water use requirements during establishment would be of great interest to turfgrass managers around the world. The purpose of this trial was to determine if a single application of granular or liquid Hydretain at the time of seeding results in enhanced survival and establishment of newly seeded turfgrass.

Materials and Methods

An experiment was conducted at the University of Illinois Department of Crop Sciences St. Charles Horticulture Research Center located in St. Charles, IL. The experiment consisted of treatments applied to a prepared soil bed under natural conditions. Treatments were applied to bare soil seeded with a mixture of 40% Kentucky bluegrass (*Poa pratensis L.* cv.'s 'Blue Chip', 'Freedom III') and 60% perennial ryegrass (*Lolium perenne L.* cv.'s 'Goalkeeper', 'Top Gun') at a rate of 3 lbs./M. The underlying soil was a Clare silt loam (Fine-silty, mixed, superactive, mesic Oxyaquic Argiudolls). The experimental design used was a randomized complete block with four replications and plots measuring 4 x 6 feet.

Treatments consisted of liquid Hydretain ES Plus (9 oz./M), granular Hydretain OC (2.7 lbs./M), granular Hydretain QD (2.7 lbs./M) and an untreated control, with each treatment duplicated under two irrigation regimes. The two irrigation treatments consisted of 0.375 or 0.75 inches of irrigation applied two-times weekly at four-day intervals.

Liquid Hydretain was applied with a backpack-type CO_2 sprayer at 32 PSI fitted with VS8002 nozzles (TeeJet Technologies, Wheaton, IL) and a spray volume of 50 gallons $acre^{-1}$. Granular Hydretain was applied by hand via a hand held spreader consisting of a mason jar fitted with a perforated lid.

Treatments were applied on September 14, 2015. After initial application, treatments were incorporated into the root-zone with ½ an inch of irrigation. Plots were evaluated weekly for turf coverage (0-100%). Environmental conditions at the time of application are listed in Table 1. Detailed environmental conditions present during the trial can be accessed at the following url: **http://www.isws.illinois.edu/warm/stationmeta.asp?site=STC&from=wx** The study was located less than one hundred feet from where these readings are recorded.

Statistical analysis was conducted using SAS v.9.1.3 to determine treatment differences.

Results and Discussion

Treatment differences were detected at every rating date over the duration of the experiment (Table 2). There was a distinct difference in turf coverage for plots that received an application of Hydretain versus those that did not over the first half of the study. The overall effect being significantly less turf coverage exhibited by plots not receiving Hydretain. This effect was less pronounced over the remainder of the study, and while not statistically significant at the conclusion of the experiment, treatments receiving no Hydretain exhibited 13-20% less turf coverage than those that did. There were no consistent differences in turf coverage between plots receiving liquid or granular Hydretain. Similarly, there was no consistent effect of irrigation regime on plot coverage over the duration of the trial. At no time was turf injury observed for those treatments receiving an application of Hydretain.

Overall Experimental Conclusions

The data presented suggest that Hydretain applied at the time of seeding presents a benefit by stimulating the initial rate of plant development and plot coverage compared to untreated plots. Under the conditions used for the experiments reported here, Hydretain does not result in negative effects to germinating seeds or seedlings. Additionally, there was no difference in efficacy between granular carriers and the liquid formulation of Hydretain. This is a finding that provides turf managers with options for applying the material while achieving the same results.

Further studies are warranted under conditions more conducive (i.e., heat and moisture stress) to the properties of Hydretain to further study the benefits it may provide in enhancing stand establishment under restricted irrigation.

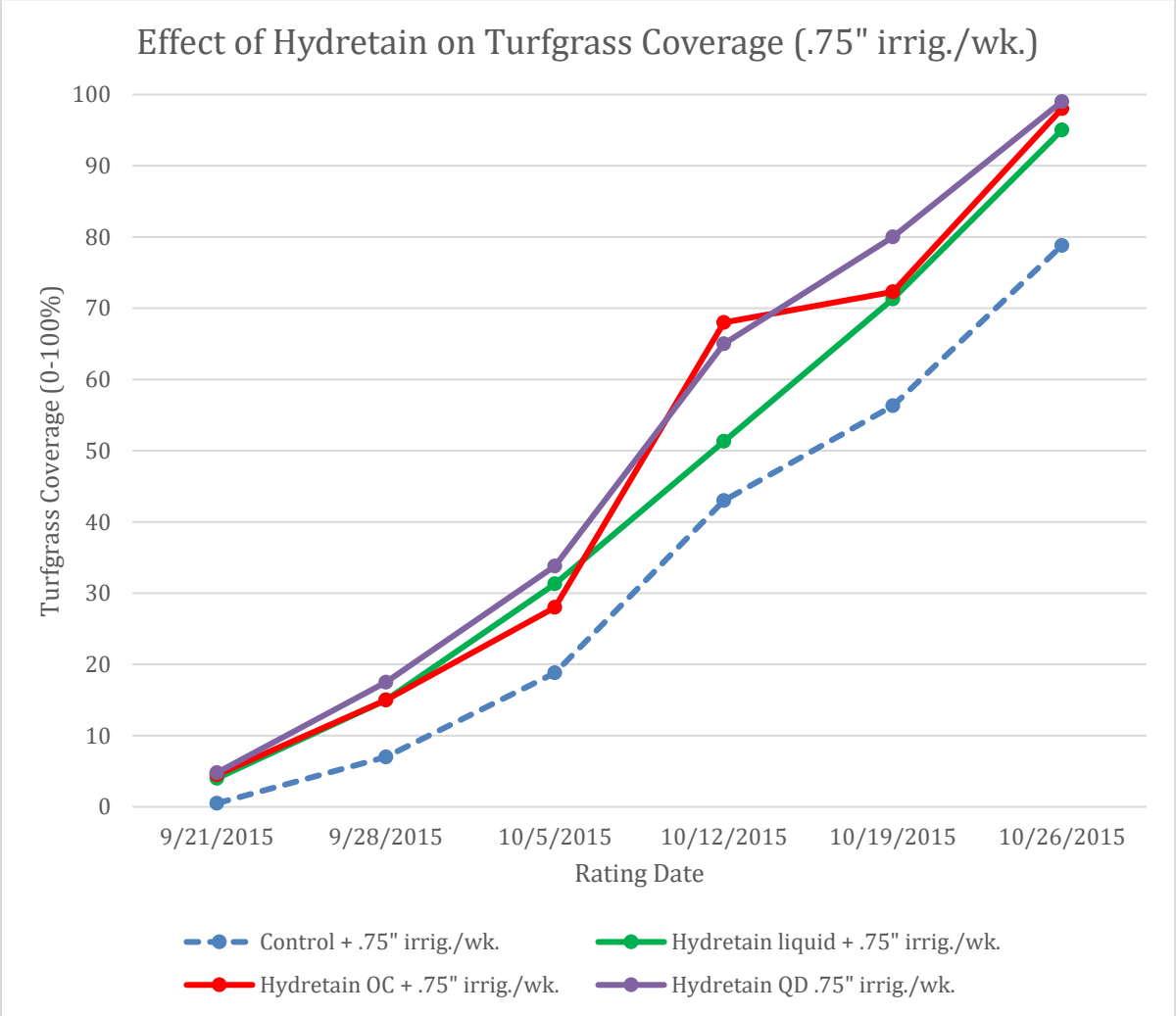
Table 1. Environmental Conditions Present at time of Treatment Application.

Application Date	9/14/15
Time/Info	9:30 AM
Air Temperature (°F)	65.0
Soil Temperature (°F)	69.8
Wind Speed (mph)	Calm
Wind Direction (from)	---
Cloudiness (%)	0
1st rain after application	Irrigation
Treatments Applied	All

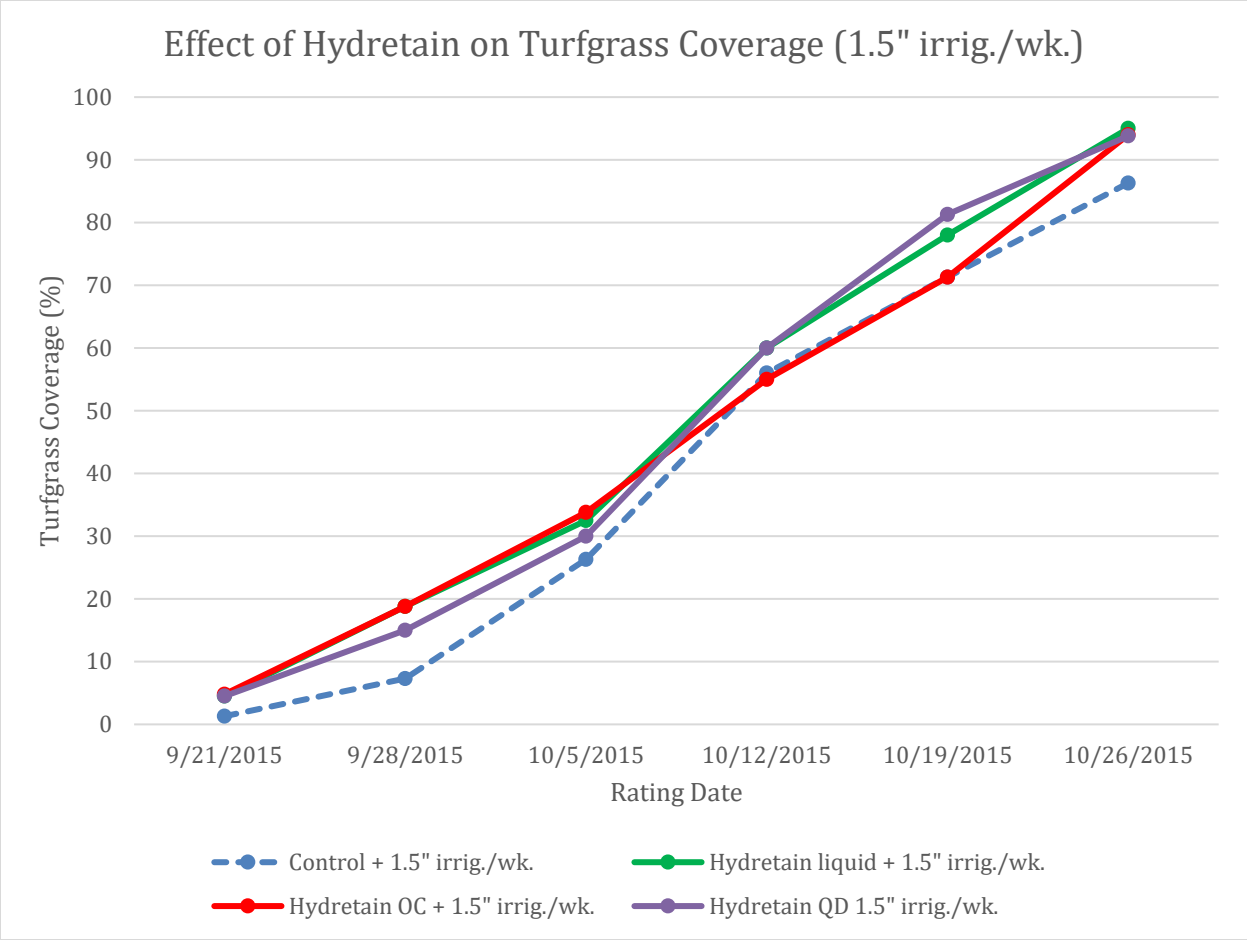
Table 2. Effect of Hydretain on turfgrass coverage.

	Rating Date					
	9/21/2015	9/28/2015	10/5/2015	10/12/2015	10/19/2015	10/26/2015
Treatment	Turfgrass Coverage (0-100)					
Control + .75" irrig./wk.	0.5b†	7.0b	18.8b	43.0b	56.3b	78.8b
Control + 1.5" irrig./wk.	1.3b	7.3b	26.3ab	56.0ab	71.3ab	86.3ab
Hydretain liquid + .75" irrig./wk.	4.0a	15.0a	31.3a	51.3ab	71.3ab	95.0ab
Hydretain liquid + 1.5" irrig./wk	4.5a	18.8a	32.5a	60.0ab	78.0ab	95.0ab
Hydretain OC + .75" irrig./wk.	4.5a	15.0a	28.0a	68.0a	72.3ab	98.0a
Hydretain OC + 1.5" irrig./wk	4.8a	18.8a	33.8a	55.0ab	71.3ab	94.0ab
Hydretain QD .75" irrig./wk.	4.8a	17.5a	33.8a	65.0ab	80.0a	99.0a
Hydretain QD 1.5" irrig./wk	4.5a	15.0a	30.0a	60.0ab	81.3a	93.8ab
LSD‡	0.9§	4.2	8.7	24.2	21.8	17.0

†Data reported as a mean of four replications
‡LSD, least significant difference ($P < 0.05$)



telephone 217-333-3420 • fax 217-333-9817
email cropsci@uiuc.edu • url http://www.cropsci.uiuc.edu/



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