County Extension Agent Turf News – Spring 2006

by

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Vol. 1, No. 1 **April 2006**

Spring Diagnoses of Turfgrass Winter Injury/Kill

Winter kill is a general term used to describe the loss of turfgrass plants during winter months. Loss of turfgrass plants during winter months can be caused by factors such as: low temperature kill (freeze damage), desiccation (drying out of plant material), disease activity and insect damage such as grubs. In most years, desiccation is the number one reason for loss of turfgrass in home lawns, commercial properties, sports fields and golf courses. With the extensive drought conditions throughout Texas in 2005, including winter months, loss of turfgrass from desiccation is potentially going to be a major problem. Individuals who did not water their turfgrass plants during the 2005-2006 winter months could experience loss of plant material. Grasses such as St. Augustinegrass and Centipedegrass are especially susceptible to winter kill from desiccation during winter months. In fact, I have already observed numerous St. Augustinegrass lawns in the Dallas area that appeared to have loss some grass. While it is a little early to tell how extensive the damage will be, I would expect there to be a significant loss of St. Augustinegrass in lawns that were not watered during the past winter months. While St. Augustinegrass and Centipedegrass are hardest hit by the dry conditions, it is also possible to loose turfgrasses such as bermudagrass and zoysiagrass, especially if they were not watered at all in late summer and winter months.

Trying to diagnose what killed the turfgrass plant during the dormant winter period can sometimes be difficult. Listed below are symptoms to look for when trying to determine the actual cause for loss of turfgrass areas in the winter months.

A. Low temperature/desiccation:

The symptoms for both of these causes are very similar and it is often impossible to determine which one actually killed the grass. In some situations, loss of grass can be attributed to both dry soil conditions and low temperature injury. With both of these factors, the entire turfgrass plant will be a brown to tan color, eventually turning a gray color in late winter to early spring. Even though the root system is dead, the turfgrass plant will still be firmly attached to the ground. In comparison, if the loss is due to grub injury, the dead grass can be easily lifted from the soil because all the roots have been chewed off by the grubs.

B. Grub damage:

The white grub, larval stage of the May/June beetle will feed on the turfgrass plants in late summer to early fall months, thus destroying the root system of the grass plants. Without any root system, the grass plant cannot take up the necessary nutrients and water required for survival. Again, the easy way to distinguish between grub damage from environmental damage is to pull on the turfgrass plants and if the grass pulls up very easily, then the damage is likely to have been caused by grubs feeding on the root system the previous summer and fall months. Also, in late winter to early spring months you should be able to find the white C-shaped larvae in the soil below the damaged turfgrass. Generally, it takes at least 4 to 5 grubs per square foot to cause loss of turfgrass.

C. Diseases:

There are two main disease problems that can cause serious damage and/or loss of turfgrass plants in the winter months. These are brown patch and Take-All Root Rot (TARR). While brown patch will attack all major turfgrass plants, it is primarily a problem on St. Augustinegrass, Centipedegrass and zoysiagrass in the fall months when night time temperatures drop below 70° F and excess water is available. Usually, the brown patch fungus does not kill the plants, but will kill all the leaf blades in the affected areas, thus weakening the plants and making them more susceptible to low temperature injury. Also, affected sites in the lawn will be slower to green up in the following spring and may appear to be dead areas as the lawn starts to green up. The easiest method to identify old brown patch injury is to pull on the leaf blades in the affected area and if they pull away from the stolons without any resistance, then the damage was caused by brown patch. Also, if brown patch is the only problem, then the stolons and roots will still be white to light green in color.

Take-All Root Rot is caused by a soil borne fungi that attacks the root system of the plant in the fall and spring months when soil temperatures are in the 60 to 65° F range. This fungus has also been shown to attack all turfgrasses, but has primarily been a major problem on St. Augustinegrass. Symptoms of TARR in the spring include thin, yellow stands of St. Augustinegrass to large patches of totally dead grass. Due to the drought conditions in the fall and winter months in 2005 – 2006, there is probably going to be a lot of TARR problems showing up in lawns this spring. TARR and brown patch are often confused with each other and in some cases it is possible that both diseases were active in the lawn. Outlined below is a chart to help distinguish the difference in damage from TARR and brown patch.

Plant part	TARR	Brown patch
Leaves	brown, firmly attached	brown, easily pulled from stolons
Stolons	brown	white to light green
Roots	short, dark brown to black*	white

* The short, dark brown to black roots is a very key characteristic for identifying TARR activity. In some cases, due to the extensively damaged root system, the St. Augustinegrass can be pulled up similar to grub damage. However, with grub damage, the roots have been completely chewed off the plant, while with TARR you will still find the short, dark brown to black roots on the stolons.

Turfgrass Best Management in Drought:

For most areas of the state, 2005 was one of the driest years on record. Even though some areas of the state recently have received some welcome rainfalls, forecasts are still for this drought condition to continue, at least until sometime in the summer months. Many cities and towns are already talking about going to phase III water restrictions shortly and possibly phase IV restriction within the next couple of months if adequate rainfall does not occur. Phase IV restrictions generally means no outdoor use of water. While there is not a lot homeowners can do to save their lawn if water becomes unavailable for use on landscapes, proper lawn management this spring until phase IV restrictions are put in place will have a major impact on how long the lawn can survive drought conditions. Listed below are some best management practices for managing turfgrasses in a law during drought conditions.

A. fertilization:

As long as water is available, apply the recommended rate of nitrogen for the turfgrass site. Do not apply excess nitrogen and create excess topgrowth in the turfgrass plants during the spring months. Creating excess topgrowth will affect the plants ability to develop a deep, extensive root system. For most turfgrasses, apply 0.5 to 1.0 pound of actual nitrogen per 1, 000 sq.ft. in the spring months. If lawn irrigation is severely restricted or completely turned off, then discontinue applying any more fertilizer, especially nitrogen, to the lawn. If a soil sample has not been taken, recommend the homeowner have the soil in their lawn tested to make sure there is adequate phosphorus and potassium to meet the plants needs. Potassium is a key nutrient in stress tolerance for turfgrass plants, including drought tolerance. If soil potassium levels are low, then apply a fertilizer in the spring that has both nitrogen and potassium in the fertilizer. For more information on proper spring timing of fertilizer application for your area, refer to publication " Lawn Fertilization for Texas Warm Season Grasses: Frequently Asked Questions (SCS-2005-15)" for more information. It is available at the following link:
http://aggie-turf.tamu.edu/answers4you/fertilization.htm

B. Mowing:

As long as the turfgrass plant is growing, then continue to mow. Make sure the lawn is mowed often enough to never remove more than 30 to 40% of the leaf blade. Removing excess leaf area will stress the turfgrass plants and thus make them less tolerant of drought conditions. If the grass stops growing due to drought conditions, then discontinue mowing the grass.

Slightly raising the mowing height will help reduce some stress on the turfgrass plants. However, raising the mowing height doesn't mean the turfgrass plants will use less water as some people believe. Listed below are recommended mowing heights for the different turfgrasses in home lawns during drought conditions.

Grass	Height (inches)
Common bermduagrass	2 to 2.5
Hybrid bermduagrass	1 to 1.5
St. Augustinegrass (sun)	3 to 3.5
St. Augustinegrass (shade)	3.5 to 4.0
Centipedegrass	1.5 to 2.0
Zoysiagrass (japonicas)	1.5 to 2.0
Buffalograss	2.0 to 3.0

C. Irrigation:

As long as water is available, continue to water the lawn. However, it is very important that supplemental water be applied wisely and not wasted. **Applying excess amounts of irrigation water in the spring will not mean the soil will hold water longer going into the summer months.** In fact, applying excess water to lawns in the spring will result in a turfgrass plant with a shortened, week root system going into the hot, dry summer months. Water the landscape as infrequently and deeply as possible. However, soil type and soil depth will often dictate how often landscapes need to be watered. As a general rule, apply 1.0 inch of water per week in the spring and fall months and 1.5 to 1.75 inches of water in the heat of summer if adequate rainfall does not occur. Note, a majority of warm season turfgrasses can survive with less.

Conduct an audit of the irrigation system to make sure it is working as efficiently as possible and to determine how much water the system is applying. First part of an audit is to inspect the irrigation system for any problems that would affect irrigation uniformity, such as broken sprinkler heads, heads not rotating, heads not popping up high enough and mis-aligned heads (heads not vertical). Fix any problems noted during the inspection. The second phase of an audit is to determine how fast the water is being applied (measured in inches per hour) and how uniformly the water is being applied (measured in percent). Listed below are the steps for conducting this part of an irrigation audit.

- place 5 to 6 straight edged cans (cat food, tuna, etc.) in one zone of the irrigation system. Note, the more cans you use, the more accurate the test.
- Turn that zone on and run it for a set period of time, say 30 minutes.
- Take a ruler and measure the depth of water in each can and record it.
- Calculate the average depth of water from all of the cans.
- Repeat this sequence for all zones.

Example: Five cans were used for zone 1 in the irrigation system. The amount of water found in the five cans was as follows: 0.5, 0.4, 0.6, 0.4 and 0.6. Add the depths together and then divide by the number of cans (five).

0.5 + 0.4 + 0.6 + 0.4 + 0.6 = 2.5 inches of water divided by 5 (cans) = 0.5 inches of water in 30 minutes or 1.0 inch of water per hour. This means zone 1 would need to be run for one hour each week in the spring and fall and approximately 1.5 to 1.75 hours in the heat of summer to apply the necessary amount of supplemental irrigation for healthy plant growth.

Do not apply irrigation water to run-off. Runoff wastes water. If run-off occurs before the required amount of water can be applied, then turn the irrigation system off and apply the rest of the water needed later in the week.

To determine the distribution value, compare average of lowest quarter of catch cans with the average for total catch cans. Listed below are the steps for calculating distribution uniformity using the lowest quarter method. Note, need at least 8 catch cans to obtain a distribution value. The more catch cans you use, the more accurate the distribution value. It is best to do this procedure in times of low wind (early morning).

Step 1. List catch can volumes (water depth in inches) from the smallest to largest depth collected.

Step 2. Calculate the average depth volume (inches) for the lowest quarter (one-fourth) of the catch cans, cans with the lowest water levels.

Step 3. Calculate the average volume level (inches) for all the catch cans.

Step 4. Divide the lower quarter volume average (inches) by the total water volume level average (inches) and then multiply by 100 to obtain the distribution value.

Formula: **DU** = 100 x (**V**lq ÷ **V**avg.)
DU = distribution uniformity.
Vlq = Volume average of lower quarter of total catch cans.
Vavg. = Volume of total catch cans divided by total number of catch cans.

Example: Calculate distribution value for following 8 catch can volumes:

Catch cans = .2 + .3 + .3 + .4 + .4 + .5 + .6 + .6

a. lowest quarter = .2 + .3 = .5 ÷ 2 = .25
b. total volume = 3.3 ÷ 8 = .41 inch
c. DU = 100 x (.25 ÷ .41) = 61% distribution uniformity

Weed Control Programs:

By now, spring application of preemergent herbicides for the control of summer annual weeds should have been applied. However, if they have not been applied, application of a preemergent herbicide at this time will still control a majority of the summer annual weeds. Application of preemergent herbicides should be used on St. Augustinegrass and centipedegrass lawns with caution in the spring. While these herbicides are selective for turfgrasses, they can cause root pruning in these particular grasses, especially if they are under stress. Also, bermudagrass and/or zoysiagrass areas that were not watered during the winter months should be treated with caution.

The summer grassy and broadleaf weeds are just starting to appear in turfgrass sites. For the broadleaf weeds, use one of the two-way or three-way hormone herbicide combination products. For grassy weeds, use one of the herbicides containing MSMA or DSMA. Note, for the arsenical herbicides to work, daytime temperatures need to be in the upper 80 to lower 90° F range. For hard to control grassy weeds such as dallisgrass, it will probably take 2 to 3 applications applied at a 7 to 10 day interval. It is very important to not water or mow the turfgrass for at least 24 and preferably 48 hours after treating with one of the arsenical herbicides. Note, remember that the arsenical products such as MSMA and DSMA cannot be used on St. Augustinegrass or Centipedegrass lawns.

Listed below are several herbicide lists. While these are partial lists, they do contain some of the more common herbicides used for weed control in turfgrass areas. Always caution anyone that it is their responsibility to read the herbicide label carefully before purchasing the product to make certain it is 1) still labeled for use on the weed they are trying to control and 2) and for the site (residential lawn vs. sports field vs. sod farm, etc.) and 3) the particular turfgrass species and variety they are treating. They should also always read the label carefully before applying the herbicide to make sure the correct rate is being applied for effective weed control.

These lists are for County Extension Agents to use as a resource list when making herbicide recommendations. We wouldn't advise sending the entire list out to anyone.

Table 1. Partial List of Common and Trade Names for Preemergent Herbicides Used to Control Annual Weeds in Turfgrasses:

Common name	Trade name(s)
atrazine	Atrazine 4L, Aatrex 4L, Purge 4L
benefin	Balan 2.5 G, Balan 60 DF, 2.5 Benefin Granules
benefin + oryzalin	XL 2G, Excel-5 Plus
benefin + oxadiazon	Regal Star
benifin + trifluralin	Team 2G, Team Pro
bensulide	Betasan, Bensumec, PreSan, Weedgrass Preventor
bensulide + oxadiazon	Goose/Crab Control
dithiopyr	Dimension, Ultra WSP
ethofumesate	Prograss 1.5 EC
isoxaben	Gallery
metolachlor	Pennant Magnum 7.62 EC
oryzalin	Surflan 4 AS
oxadiazon	Ronstar[1]
pendimethalin	Pendulum (several), Pre-M
prodiamine	Barricade, Endurance, Factor, RegalKade G
pronamide	Kerb
simazine	Princep 4L, Simazine 4L, Simtrol 4L

1. not for use in residential lawns.

Table II. Partial List of Common and Trade Names for Postemergent Control of Broadleaf Weeds in Turfgrass:

Common name	Trade name(s)
atrazine	Atrazine, Aatrex 4L, Purge 4L
carfentrazone	Quicksilver
chlorosulfuron	Corsair
clopyralid	Lontrel[1]
diquat	Reward Landscape & Aquatic Herbicide
ethofumesate	Prograss 1.5 EC
flazasulfuron	Katana
fluroxpyr	Spotlight
foramsulfuron	Revolver
imazaquin	Image
MCPA	MCPA L.V. 4 Ester
MCPA, MCPP, dicamba	TriPower Selective, Encore,
MCPA, MCPP, dicamba, carfentrazone	Powerzone
MCPA, triclopyr, dicamba	TruPower
MCPA, fluroxypyr, dicamba	TruPower 2
Mecroprop (MCPP)	MCPP-4 amine, Mecomec 2.5 EC
MCPP, 2,4-D, dicamba	Trimec Southern, Lesco Three Way Selective, Bentgrass Selective, Triplet SF
MCPA, triclopyr, dicamba	Cool Power Ester, Lesco Eliminate, Three Way Ester II Sensitive, Horsepower
metsulfuron-methyl	Blade, Manor
quinclorac	Drive
triclopyr	Turflon Ester
triclopyr, clopyralid	Confront[1]
2,4-D	Dymec, WEEDestroy AM-40 Amine, Hardball, Lesco A-4D
2,4-D, 2,4-DP	Patron 170 Ester
2,4-D, clopyralid, dicamba	Millennium Ultra
2,4-D, clopyralid, dicamba, MSMA	Millennium Ultra Plus
2,4-D, dicamba	Lesco Eight-One
2,4-D, MCPP, dicamba	Three-Way Selective, Trimec Southern, Trimec Bentgrass, Trimec Classic, Trimec Turf Herbicide
2,4-D, MCPP-p, dicamba	Triplet HI-D, Triplet Selective
2,4-D, MCPP,dicamba, carfentrazone	Speedzone, Speedzone Southern
2,4-D, MCPP, dicamba, sulfentrazone	Surge
2,4-D, MCPP, 2,4-DP	Dissolve, Triamine
2,4-D, triclopyr, clopyralid	Momentum
2,4-D, triclopyr	Chaser
MSMA, 2,4-D, MCPP, dicamba	Trimec Plus
trifloxysulfuron	Monument

1. not for use in residential lawns.

Table III. Partial List of Common and Trade Names for Control of Grassy Weeds in Turfgrasses:

Common name	Trade name(s)
chlorsulfuron	Corsair
diquat	Reward Landscape & Aquatic Herbicide
ethofumsate	Prograss 1.5 EC
fenoxaprop	Acclaim[1]
flazasulfuron	Katana
foramsulfuron	Revolver[3]
fluazifop-p-butyl	Fusilade II[2]
metribuzin	Sencor 75W
metsulfuron-methyl	Blade, Manor
MSMA	MSMA 6 Plus, Bueno 6, Target 6.6, MSMA Plus HC, TurfMax 6 Plus, MSMA Turf Herbicide, Lesco Soluble MSMA Granules
MSMA, 2,4-D, MCPP, dicamba	Trimec Plus
rimsulfuron	TranXit[3]
trifloxysulfuron	Monument[3]

1. for grassy weed control in cool season turfgrasses.
2. for control of grassy weeds in zoysiagrasses.
3. primarily used for poa annua control and as ryegrass transition aid.

Table IV. Partial List of Herbicides for the Control of Sedges in Turfgrasses:

Common name	Trade name(s)
halosulfuron	Sedgehammer
imazaquin	Image
sulfosulfuron	Certainty
trifloxysulfuron	Monument
sulfentazone	Dismiss

Table V. Partial List of Common and Trade Names for Preemergent Weed Control in Home Lawns by Homeowners:

Common Name	Trade Names (partial list)
1. dithiopyr	Sta-Green Crab Ex; Green Light Crabgrass Preventor; Vigoro Preemergent Crabgrass and Weed Preventor
2. pendimethalin	Scotts Halts Crabgrass Preventor
3. oryzalin	Southern Ag. Surflan A.S.
4. isoxaben	Portrait Broadleaf Weed Preventor
5. benefin + oryzalin	Green Light Amaze Grass and Weed Preventor; XL 2G;
6. benefin + trifluralin	Hi-Yield Crabgrass Preventor; Southern Ag. Team 2 G
7. corn gluten meal	Concern All Natural Weed Preventor Plus Nature's Guide Corn Gluten Meal

Note, labels can change on a regular basis. Therefore, always read the labels before purchasing and before using any of these herbicides to determine which grasses they can safely be used on and what weeds they will control.

Table VI. Partial List of Common and Trade Names for Postemergent Weed Control in Home Lawns by Homeowners:

Common Name	Trade Names (partial list)
1. 2,4-D	2,4-D Amine No. 4; American 2,4-D Selective Weed Killer
2. 2,4-D, MCPP, Dicamba	Ace Spot Weed Killer; Bayer Advanced Lawns Southern Weed; Ferti-lome Weed Out Lawn Weed Killer; Green Light Wipe Out Broadleaf Weed Killer; Ortho Weed-B-Gon; Spectracide Weed Stop For Lawns; Southern Ag. Lawn Weed Killer: Hi-Yield Lawn Weed Killer; Bonide Weed Beater Lawn Weed Killer; Bonide Weed Beater Southern Lawns
3. imazaquin	Ambrands Image
4. msma, dsma, cma	Green Light MSMA Crabgrass Killer; Ambrands Image "Kills Crabgrass"; Ortho Weed-B-Gon Crabgrass Killer for Lawns; Bonide MSMA Crabgrass Killer; Ferti-lome Crabgrass, Nutsedge and Dallisgrass Killer; Hi-Yield 529 MSMA Weed Killer
5. 2,4-D, mcpp, dicamba msma	Bayer Advanced Lawns All-in-One Weed Killer; Ferti-lome Weed Out Plus Lawn Weed and Grass Killer; Bonide Weed Beater Plus
6. triclopyr	Ortho Weed-B-Gon Chickweed, Clover and Oxalis Killer; Hi-Yield Turflon Ester
7. bentazon	Southern Ag Sedge Hammer; Monterey Nihalator; Hi-Yield Basagran
8. mcpp, 2,4-D, dicamba	Southern Ag Lawn Weed Killer; Ortho Weed-B-Gon Weed Killer for Lawns; Ortho Weed-B-Gon Kills Weeds, Not Lawns
9. 2,4-D, mcpp, dicamba, carfentrazone	Ferti-lome Weed Free Zone
10. 2,4-D, MCPP_p, dichloprop_p	Basic Solutions Lawn Weed Killer
11. 2, 4-D, triclopyr, dicamba	Bonide Chickweed, Clover and Oxalis Killer; Ortho Weed-B-Gon Max
12. 2,4-D, MCPP, dicamba + sulfentrazone	Spectracide Weed Stop 2X for Lawns

Note, labels are always changing. Always advise individuals to read the label before purchasing and before applying to make sure the herbicide is still labeled for use in their type of lawn grass and for the weeds they are trying to control.

Following is a list of several websites that are excellent for looking up common weeds found in turfgrasses.

1. www.weedalert.com
2. www.griffin.uga.edu/grf/dept/cropsci/turf/weedcontrol/homepage.shtml
3. www.psu.missouri.edu/fishel/Default.htm
4. http://ipm.ucdavis.edu/PMG/weeds_common.html
5. http://jimmcafee.tamu.edu
6. www.ppws.vt.edu/weedindex.htm