

## Reinspection VTM

We provide "peace of mind" to our customers by protecting their property from future termite infestation and/or damage. To back up this protection, we issue one of the finest guarantees in the industry. The annual reinspection is a vital part of this guarantee and the protection it provides.

An effective reinspection is a complete reinspection, which includes inspecting the inside of the structure. We will only provide a complete (inside/outside) inspection. We ***DO NOT*** provide outside only inspections.

The following clarifies our policy on handling Reinspections:

Reinspection Process:

- Customers must be present in their home during the scheduled reinspection, regardless of whether the renewal fee is paid or unpaid; otherwise, a reinspection will not be performed.
- Reinspections will only be scheduled if the customer confirms their availability to be present.
- If the customer is not at home at the scheduled reinspection time, the reinspection will not be conducted.
- We do not offer exterior-only inspections.
- All team members will receive compensation for conducting complete (inside/outside) reinspections, which must last a minimum of 30 minutes (20 minutes in the Villages) to qualify for payment.
- There will be no compensation for conducting an exterior-only inspection.
- We will continue to make efforts to schedule reinspections for all termite/bait customers through our existing renewal notices and outbound calls.

The following scenarios illustrate our responses to each situation.

1. We call to schedule a reinspection. The customer agrees to next Tuesday at 10am. We arrive and Mr. Smith is home.
  - a. We will perform a complete (inside/outside) inspection and pay the team member regular commission.
2. We call to schedule a reinspection. The customer agrees to next Tuesday at 10am. We arrive and Mr. Smith is not home.
  - a. We will leave without performing an inspection. No commission will be paid.
3. We call to schedule a reinspection. The customer agrees to next Tuesday at 10am. We arrive and Mr. Smith is home, but we cannot access the inside of the home.

- a. We will explain we need access to the inside of the structure. If we cannot access the interior, we will leave without performing an inspection. No commission will be paid.

#### Administrative Process for Reinspections on Production to Do

- Reinspections will no longer remain on Production to Do during the month end closing process.
- All Reinspections that are not complete by the end of the month will be skipped and moved to the renewal month in the following year.
- If a customer calls to schedule a full interior/exterior Reinspection, that has been skipped, follow the steps below:
  - Click on the Reinspection event for next year
  - Schedule the inspection for the appropriate date and time per the customer request
  - Mark the Reinspection as confirmed
  - Update the future Reinspection event to be due on the warranty date for next year (ex. skipped Reinspection date May 2, 2027, updated to May 2, 2026, 12:00 PM and marked as confirmed, next Reinspection date will be updated to the renewal date for the following year)
- A customer that will not schedule a reinspection with the customer home, whether the renewal is paid or unpaid, will not receive a reinspection.
- Multi-family reinspections will be performed per current policy.

## **Drywood and Dampwood Termites**

Termites can be divided into 2 groups: subterranean and non-subterranean. This VTM will focus on termites that fall under the non-subterranean group. Non-subterranean termites include drywood termites and dampwood termites. Neither of these 2 types of termite require contact with the ground like subterranean termites do. Both drywood and dampwood termites live in small colonies and mainly live and feed in the wood they infest.

### **Drywood Termites**

#### **Biology and Behavior**

Drywood termite are eusocial insects that live in colonies composed of reproductives (king, queen, alates), nymphs and soldiers. There is no worker caste as found in a subterranean termite colony. Immature termites, known as nymphs, perform the work of providing food, shelter and moisture before they develop into reproductives. King and queen termites perform the reproductive functions of the colony. Soldier do not do damage to wood or cellulose items and rely on nymphs to feed them. The primary function of soldiers is the defense of the colony. All members of the colony are blind, except for the reproductives.

In comparison, drywood termite colonies are smaller than subterranean termite colonies due to their slow development and low reproductive rate. Research has shown it may take 5 or more years for an entire colony to mature.

Because drywood termites live and feed on wood of low moisture content, they must conserve as much water as possible. They possess glands at the end of their abdomen that compress fecal matter as it is excreted out of their body. This compression pulls as much water from the fecal matter as possible. The result is a pellet with 6 indentions. These pellets are usually found in piles near infested wood.

It is more common to find drywood termite infestations in coastal areas, but they can be found inland. Drywood termites only infest dry, sound wood. The moisture they require is obtained from the wood they feed on. They require as little as 2.5-3.0% moisture, but prefer wood with 10%. Regardless of where the wood is located, if it meets these requirements, it is subject to attack. This includes structural wood, furniture, wood floors and any objects made of wood.

Drywood termites can become established in a structure when alates enter through cracks around windows, door frames, trim, and siding, roof and gable vents, fascia boards, soffits, unscreened areas, etc. Once inside a structure, they bore into wood. They can also be transported into a structure in wood furniture, picture frames, flooring, etc.

#### **Identification**

Because drywood nymphs are nearly indistinguishable from subterranean workers, you will need either soldiers or alates to determine the species of termite you are dealing with.

### *Soldiers*

Drywood termite soldiers are wingless and white in color with large rectangular orange-brown heads and mandibles. The inside of their mandibles have 2 teeth and their pronotum (the shield like structure right behind the head) is wider than the head. In addition, drywood termite soldiers have an enlarged 3<sup>rd</sup> segment on their antennae.



### *Alates*

The 2 pair of wings of a drywood termite alate are of equal size and twice the length of the body. Each wing has 3 prominent, darkened, parallel veins along the top margin. In addition, at the curved end of the wing, between the parallel veins are small veins running crossways, known as cross veins.



### **Signs of an Infestation**

#### Alates

When a drywood termite colony is mature, it will produce swarms to establish new colonies. In the southeast United States, swarming occurs at various times from April to July at dusk or evening. Depending on weather patterns, they may swarm at other times during the year. If alates are observed in the home, it is likely there is an infestation inside the home. A thorough inspection must be conducted as there is a chance they alates may have come from the outside of the structure. Alates will drop their wings shortly after flight and because they are attracted to light they can usually be found around windows, doors, in light fixtures and in spider webs near light fixtures.



#### Fecal Pellets

The fecal pellets of drywood termites are about the size of a grain of sand and will take on the color of the wood that they are feeding on. As pellets are excreted from drywood termites feeding on the wood, they will accumulate in a pile under the damaged wood. Wood will also contain holes, known as kick holes, since drywood termites will push the pellets out of their



feeding galleries. If the piles of pellets you observe are small, neatly shaped piles, the kick hole is most likely close to the pile. If pellets are scattered about, the kick hole is located higher up from the pile.

### Damaged Wood

Wood damaged by drywood termites will be very clean and smooth, with no dirt present, since they do not require contact with the soil. Fecal pellets will be present inside of the feeding galleries. Both the soft springwood and hard summerwood is eaten by drywood termites. They feed with and across the grain and feeding galleries are wider than that of subterranean termites, who only feed on the soft springwood.



### Dampwood Termites

Dampwood termites do not require contact with the soil and will only infest wood with extremely high moisture, usually associated with wood decay. This species rarely does structural damage and is of little economic importance. If a structural infestation is located, it is associated with a source of free water such as wood exposed to leaks in the roof, wood to soil contact, or wood constantly exposed to rainfall or irrigation systems. Treatment is usually not necessary, since once the moisture source is removed, the colony will desiccate and die.

Feeding galleries are very wet and dirty and fecal pellets present will be clumped together within the feeding galleries. They feed on both the hard summerwood and soft springwood.

#### Identification

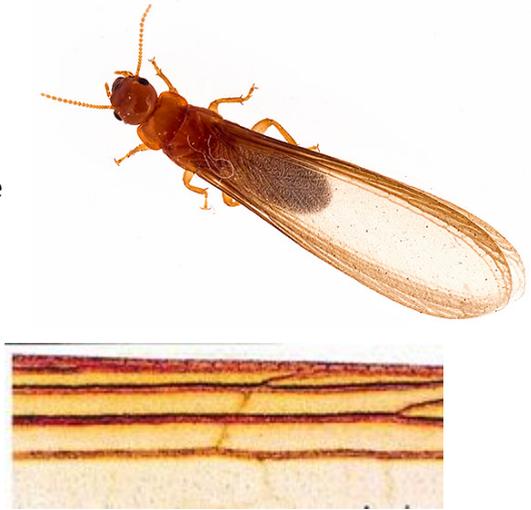
##### Soldiers

Soldier of dampwood termites are large, with a rectangular/oblong shaped head. The inside of the mandible has teeth and the pronotum is as wide as the head. There are no enlarged segments on their antennae.



## Alates

Dampwood termite alates are the largest of the alates we deal with, have brown bodies and possess wings with 4 darkened veins along the top margin. Cross veins can be found between the darkened veins at the curved end of the wing.



Correct identification of termites is essential in effectively eliminating an infestation. A treatment that works for drywood termites will be ineffective on subterranean termites and vice versa. If you are unsure what species you may be dealing with, collect samples and bring them back to the Service Center or a Technical Director for identification.



## INDIAN MEAL MOTH ELIMINATION SERVICE CHECKLIST

To complete an effective Indian meal moth elimination service, the property must be properly prepared for service. The following outline reviews the steps that must be taken in preparation for the service as well what the treatment and follow-up will consist of.

### CUSTOMER PREPARATION Review each step and have customer initial PRIOR TO SERVICE

#### Retail Sales Floor and Warehouse Storage Area

- \_\_\_\_\_ Discard any open food items and any items that are infested with Indian meal moths. Place in a plastic bag and dispose of in the exterior dumpster.
- \_\_\_\_\_ On the retail sales floor, vacuum floor, gondolas, under gondolas, peg boards (front and back) to remove any food items and all stages of Indian meal moths. Pay close attention to cracks and crevices where food may gather as these are potential areas where Indian meal moths may harbor. Also, vacuum any cocoons you may observe.
- \_\_\_\_\_ Both sides of the gondolas need to be emptied of product to allow for treatment of the area.
- \_\_\_\_\_ In the warehouse, vacuum up any spilled food items on shelving and floors. Pay special attention to cracks and crevices on the shelving where Indian meal moths may harbor. Also, vacuum any cocoons you may observe.
- \_\_\_\_\_ After vacuuming, discard the vacuum bag and its contents into a garbage bag then dispose of in the exterior dumpster.

### SERVICE After preparation is complete, the Massey Services' Technician will:

- \_\_\_\_\_ Perform a complete inspection of the all areas to identify sources and harborage areas of Indian meal moth activity. This will include the undersides of all shelving levels.
- \_\_\_\_\_ Inspect unopened food items for activity.
- \_\_\_\_\_ Provide additional vacuuming in all areas of suspected and potential Indian meal moth activity.
- \_\_\_\_\_ Treat cracks and crevices where Indian meal moths may be harboring.
- \_\_\_\_\_ Inspect, treat and vacuum the front and back of the gondola pegboard.
- \_\_\_\_\_ Place insect detection traps and Indian meal moth specific traps in areas where activity was present or is suspected.

### POST-TREATMENT

- \_\_\_\_\_ Once the treatment to the gondolas is dry, the store personnel will need to reconstruct them.
- \_\_\_\_\_ Continue to vacuum up any spilled food items and Indian meal moth cocoons you may see.
- \_\_\_\_\_ You may see adult moth activity a few days after treatment. Massey will return in 5-7 days to follow-up. If activity persists, prep work and retreatment may be necessary.

This initial service will eliminate the majority of Indian meal moth activity in the structure. Additional treatment will be provided as required. As required the technician may schedule additional 5-7 day follow up visits.

All products used in these services are performed in accordance with EPA approved label instructions, as well as applicable Federal, State and local laws.

Should you have any questions, please contact our Service Center (\_\_\_\_\_) \_\_\_\_\_

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
 Service Technician/Sales Inspector                      Date                      Customer                      Date



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

**Topic Category:** Lawn

**Recordable Verifiable Training Hours:** 1.5 to 2 hours

**Objectives:**

- Read and discuss our Weed Management Protocol and to identify many of the basic weed species and the typical conditions in which these weeds flourish.
- Ensure proper understanding by all Specialist of Backpack sprayer use
- **To calibrate every Specialist**
- **To ensure that every Specialist is properly equipped with the correct spray tip on the back pack sprayer, a proper measuring cup that will measure from ½ to 10 ounces, and a clear water measuring jug that will measure from ½ to 2.5 gallons of water.**
- It is also designed to ensure that everyone in Florida and Louisiana understands that we do not put post emergence herbicides into the drop tank. They used from the back pack sprayer only. This training will be used to document the fact that your Specialist know that if they use the post emergence materials from the drop tank, it could result in termination of employment and damage results, they will be paying for the damage.

**This meeting will qualify for 1 hour of Department of Ag ID Cardholder Training. Make sure you fill out the Department of Ag ID Cardholder Training form for each Team Member. Keep a copy in the Team Members training file at your office.**

**KEEP A COPY OF THE GRADED POST TEST IN THE TEAM MEMBER'S TRAINING FILE AS DOCUMENTATION THAT THE TEAM MEMBER UNDERSTANDS OUR POLICY OF USING THE WEED CONTROL SLURRIES ONLY FROM A BACKPACK SPRAYER.**

**Length of lesson:** 90 to 120 minutes.

**Materials needed:**

- Training Guideline (Below)
- Training Document Weed Management Protocol (GreenUp Protocols\Individual Protocols\Lawn Care Basic Application)
- 25 by 40 foot area marked for calibration
- 2 Clean backpack sprayers in good working condition with 11010 spray tips.
- A weighted string at the end of the spray wand near the nozzle measured at 20 inches long from the end of the wand to the end of the weights at the string.
- Clear 2.5 gallon jug with ½ gallon increments
- 32 ounce measuring cup
- Stopwatch to time each pass (10 seconds for each 40 foot pass)
- Collect samples of many of the weeds listed below from the field, if available.

Blanket Crabgrass, Alexandergrass, Goosegrass, Bermudagrass, Annual Jewgrass, Doveweed, Kyllinga sedge, Yellow Nutsedge, Purple Nutsedge, Globe sedge, Virginia Button weed, White Clover, Dichondra, Spurge, Chamber Bitter, Yellow Wood Sorrel, Asiatic Hawksbeard.

- Pre- and Post- tests.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

#### Training Guidelines:

- Set up the training area in an area of the office that will minimize disruptions to deliver the protocol training and the 40 by 25 foot area outside for calibration.
- Make sure all calibration materials listed above are readily available for the calibration portion of the training.
- Make copies of the tests and training materials for all Team Members attending.
- Hand out the Department of Ag ID Cardholder Training Form and have all Cardholder complete the form. The training must be a minimum of 60 minutes to qualify.
- Begin the meeting by defining the training topic and handing out the Pre-test
  - Allow a few minutes for Team Members to complete the Pre-test.
  - Collect the pre-test and hand out the Verifiable Training Record Form (VTRF)
- Distribute and review the training materials on Weed Management Protocol.
  - Encourage active participation from all Team Members
  - Ask probing questions to develop key points
  - Encourage group reading and participation
- Perform the demonstration portion of the training
- **Demonstrate** that 1 gallon measured in the 2.5 gallon jug does not equal 1 gallon in the backpack sprayer and the measurements on the backpack sprayer must not be used.
  - Measure 1 gallon of water in the water measuring jug and pour it into the back pack sprayer.
- Time all Specialists to walk at 40 feet in 10 seconds.
- Perform the displacement method of Backpack Calibration with each Specialist while all Specialists critique.
  - Displacement method of calibration: Fill the backpack full of water, pump up the pressure chamber and spray into the backpack to remove any air from the chamber, refill the backpack until it will not hold any additional water. After the Specialist performs the treatment over the 1000 sq. ft. area, measure the amount of water that can be put back into the sprayer. The amount of water that can be put back into the sprayer is the amount of water that was used over the 1000 sq. ft. area.
  - Time each pass and provide feedback to the Specialist for the time taken to walk each pass.
  - Ensure the proper nozzle height by using the 20 inch weighted string
- After reading and reviewing all materials and performing the backpack calibration, ask questions to verify the lesson has been understood.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

Name \_\_\_\_\_ Date \_\_\_\_\_

#### PRE & POST TEST

1. T or F A dense turfgrass cover competes with weeds for space, water, nutrients and light.
2. T or F Most severe weed problems are a result of bare or thinning areas in the turfgrass canopy or a favorable environment for growth.
3. T or F Indicator weeds are indicative of an underlying problem.
4. Blanket Crabgrass may indicate
  - a. high soil moisture.
  - b. Low moisture.
  - c. Low light.
  - d. Excessive nitrogen.
5. Alexandergrass may indicate
  - a. high soil moisture.
  - b. Low moisture.
  - c. Low light.
  - d. Excessive nitrogen.
6. T or F Goosegrass is may indicate soil compaction or traffic damage.
7. T or F Doveweed can be controlled with granular Atrazine or Auguzine in St. Augustinegrass.
8. T or F Purple Nutsedge can be controlled with Basagran.
9. White Clover may indicate
  - a. Excessive nitrogen
  - b. Compacted soil
  - c. Nitrogen deficiency
  - d. Loose soil.
10. T or F Spurge, Chamber bitter, Florida Pusley and Creeping Beggarweed are summer annual broadleaf weeds.
11. T or F Performing post-emergent weed control out of a drop tank will result in termination of the Specialist performing the treatment (except when scheduled in North Georgia).



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

12. T or F Any damage resulting from performing post-emergent weed control out of a drop tank will result in the Specialist paying for any resulting damage in full (except when scheduled in North Georgia).
13. T or F I have been successfully calibrated to perform weed control from the backpack sprayer through the displacement method of calibration. I am properly equipped with two backpack sprayers for weed control, both of which have a 11010 spray tip. I also have a water measuring jug.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

#### Answer Sheet

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## WEEKLY TRAINING SESSION



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### WEED MANAGEMENT PROTOCOL

Nationally, herbicides comprise approximately 65% of all pesticides applied to lawns. This statistic underscores the fact that consumers want and expect to have relatively weed-free lawns. The best way to prevent weeds from becoming a problem in lawns is to grow a healthy, dense stand of turfgrass by providing proper fertilization, irrigation, mowing, and management of insect pests and diseases. Pre-emergent herbicide applications applied before weed germination can reduce the appearance of seasonal weeds significantly. Even under the best circumstances, however it is likely that the need for post-emergent herbicide applications will eventually arise in order to keep weeds suppressed and achieve an acceptable level of customer satisfaction.

#### Objectives

- Discuss the relationship between underlying issues causing turf decline and weeds;
- Setting customer expectations for weed control;
- Provide details on pre-emergent and post-emergent weed control applications;
- Discuss how to handle difficult-to-control weeds and follow-ups;
- Review how to make herbicide applications using a backpack sprayer;
- **Calibrate each Specialist as per the directions below;**
- Ensure that we have documentation to show that all Managers and Specialists understand that performing weed control using our post-emergent weed control slurries out of a drop tank is a terminable offense and any damage resulting from this practice will also result in the Specialist paying for the full amount of any resulting damage.

#### Underlying issues and weeds

Because soils have a lot of weed seeds already in them, there is inherently a high possibility that lawns will eventually get weeds. A dense canopy of turfgrass not only reduces the amount of sunlight reaching the soil surface reducing weed seed germination, but can out-compete most weeds trying to get established for water, space and nutrients. Most severe weed infestations are a result of bare or thinning areas in the turfgrass canopy, or a favorable environment for growth. There are many potential causes of these weed-prone areas in lawns including:

- Drought damage from poor irrigation distribution uniformity or scheduling during dry periods
- Wet conditions (heavy rainfall, over-irrigation, poor drainage)
- Damage from nematodes, insects and/or diseases
- Poor fertility
- Soil pH out of range for the particular turf species
- Poor shade adaptation

#### Indicator Weeds

Certain weeds can thrive in conditions which often cause turfgrasses to fail. When these weeds become established in areas of drought, excessive moisture, poor fertility, low or high soil pH, nematode damage, or anywhere turfgrasses are failing, they are referred to as *indicator weeds* because they are indicative of an underlying condition. Until the condition is alleviated, it is unlikely that the turfgrass will be able to recover and out-compete the weeds, even with herbicide applications. Once established, indicator weeds often continue to grow even when the underlying condition is corrected.

**WEED MANAGEMENT PROTOCOL**

These are some of the most common indicator weeds and the conditions in which they thrive:



**\*\*Blanket crabgrass** – high soil moisture



**\*\*Alexandergrass** – Low soil moisture



**\*\*Bermudagrass** – Often takes over drought damaged areas, but will also flourish in high moisture.



**\*\*Goosegrass** – Compacted soil. Common in traffic damaged areas.



**\*\*Annual Woodsgrass** – Low light



**\*\*\*Doveweed** – High moisture and low light

\*\*These weeds are grassy weeds and have no selective control in St. Augustinegrass. Spot killing with a non-selective herbicide and renovation is needed.

**\*\*\*Doveweed** can be controlled with granular Atrazine or Auguzine in St. Augustinegrass. In Zoysiagrass or Bermudagrass, Doveweed can be controlled with the Celsius/Dismiss South combination (below).

**WEED MANAGEMENT PROTOCOL**

Sedges



**Kyllinga sedge** – High soil moisture



**Yellow Nutsedge**



**\*\*Purple Nutsedge** – Disturbed soil  
Purple Nutsedge is controlled with Sedgehammer  
Basagran does not control Purple Nutsedge.



**Globe Sedge** High soil moisture, nematodes

**Perennial Broadleaf Weeds**



**Dollarweed** – High soil moisture



**Virginia Button Weed** – High moisture

**WEED MANAGEMENT PROTOCOL**



**White Clover** – Low nitrogen fertility



**Purple Wood Sorrel** – Thrives in cool weather



**Yellow Wood Sorrel** -  
Thrives in the spring



**Dichondra** – Moist soil

**Summer Annual Broadleaf Weeds**



**Spurge** – Drought and nematodes



**Chamber Bitter** – Loose soil



**WEED MANAGEMENT PROTOCOL**

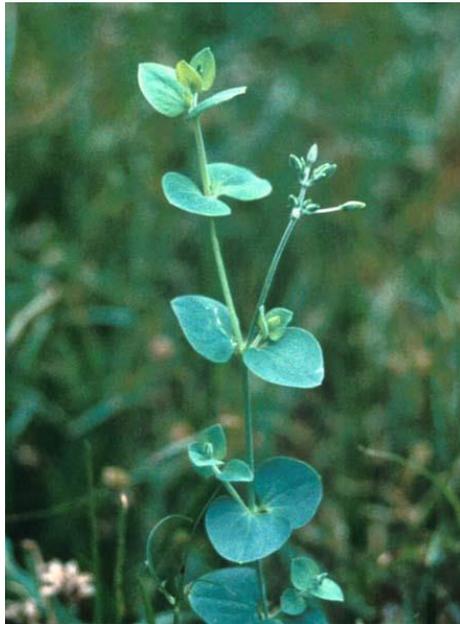


**Florida Pusley** – Drought



**Beggarweed** – Low soil fertility, drought

**Winter Annual Broadleaf Weeds**



**Heartleaf Drymary** – Moist areas



**Asiatic Hawksbeard** – Areas of thin turf



**Carolina Geranium**



**Common Chick weed**

### WEED MANAGEMENT PROTOCOL

#### Setting Customer Expectations for Weed Control

Many homeowners expect that when they hire a lawn care company, there should never be ANY weeds in the lawn. A thick, healthy lawn under proper irrigation will have very few weeds overall (< 5% coverage), but may be prone to getting more weeds (up to 10%) at certain times of the year. Higher weed levels indicate underlying problems as discussed above.

Seasonal flushes of weeds occur twice per year – spring (summer annuals) and fall (winter annuals). Pre-emergent herbicides are applied twice per year beforehand to reduce weed seed germination. Though these applications help keep weeds to a manageable level, noticeable increases in weed populations still occur during the onset of warmer and cooler weather. A higher incidence of Dollarweed, sedge, and crabgrass may occur during periods of high rainfall, or if the soil holds a lot of water due to high organic or clay content.

When weed fluctuations occur, our herbicide applications reduce the weed populations back down again, however some weed seeds can germinate in between services if conditions are still conducive. Follow-up treatments may be required depending on weather conditions and weed species present.

#### Types of Herbicides

##### Pre-emergence Herbicides

Pre-emergence herbicides create a chemical barrier in the upper soil profile. As weed seeds germinate, the new seedling is killed as it reaches this barrier of herbicide. Pendimethalin (Pre-M) or Resolute is used in most of our programs for pre-emergent weed control and lasts from 6 – 8 weeks in the soil profile. It is more effective if followed with ½ inch rainfall or supplemental irrigation. Since Pendimethalin and Resolute are root inhibitors, over-application or application to lawns with compromised roots can cause damage.

Follow these instructions when making applications with Pendimethalin or Resolute

- **Calibrate spray equipment and perform a bucket check before making applications.**
- **New sod should be mowed at least 4 times and be well rooted before application with Specticle, Pendimethalin or Resolute.**
- **Do not apply pre-emergence to stressed or damaged areas.**
- **Do not make more than one pre-emergence herbicide application within at least 90 days unless specifically directed by GreenUP Protocol.**
  - **It is critically important that attention be paid to our GreenUP Protocols for new or regular services as they relate to pre-emergence herbicide applications to avoid an additional pre-emergence herbicide application.**
  - **It is critically important that attention be paid to turfgrass retreatments during the time of year when pre-emergence herbicides are being applied with liquid broadcast applications. Pre-emergence herbicides cannot be present in the droptank during a retreatment using the droptank. Otherwise, an additional pre-emergence herbicide application would result, and turf injury would occur.**

## WEED MANAGEMENT PROTOCOL

**Pre-emergence herbicide applications should be watered in as soon as possible after application to rinse the active ingredient into the soil and prevent photo-degradation.**

### Post-emergence Herbicides

Herbicides from different chemical classes have different modes of action, often cause different symptoms, and have different timelines for weed damage. When mixed together, herbicides can be more effective than when applied alone. This is known as a *synergistic* effect. Detailed information on some common herbicides can be found in Table 2 including chemical class, mode of action, symptomology, and timeframe in which damage can be expected.

We have two different weed mixtures for broadleaf weeds in St. Augustinegrass. The weed mix we use is dependent on the time of year.

In the cooler months (from November 1 to February 28<sup>th</sup>), SBM1 is used. This slurry contains Basagran, Trimec Bentgrass Formula, Octane and Wetting agent. Auguzine is also added with this mixture to the backpack sprayer, but it is not mixed into the slurry.

In the warm season (from March 1 to October 31<sup>st</sup>) SBM2 is used. This slurry contains Manor/Blade, Trimec Bentgrass Formula, Octane and Wetting agent. Manor can regulate the growth of the desirable grass and should not be used in the cool season when the growth of the desirable grass is already being slowed down due to the cooler temperatures and shorter number of daylight hours.

Each slurry is combined before being issued to the Lawn Specialists by the Service Manager, supervisor or product room supervisor. Each product must be measured very precisely, since it will then be issued for use by all the Lawn Specialists and used on our customer's lawns. The containers used to hold this mixture must be labeled with the appropriate slurry label. These labels can be found on the G: Drive\Shared\Quality Assurance\GreenUp Reference Materials\Slurry Labels-Van Label Sets\Slurry Labels\Current Slurries\Back Pack Slurries\Lawn. The mixing instructions are on the label. Affix the label to a clean bottle with clear packing tape. Make sure the correct label is used depending on the mixture.

Each of these slurries is very effective on a wide variety of broadleaf weeds. When used properly, there will be no doubt that the weeds have been treated within a matter of a few days after treatment. Complete death of the weeds may take two to four weeks. Follow-ups for most broadleaf weeds should not be needed if a perfect application is performed.

From March through September, Broadleaf, sedge and grassy weeds in Zoysia, Bermuda and Centipede are treated with a combination of Celsius and Dismiss South. The rates are 0.11 ounces of Celsius and 0.28 ounces of Dismiss South per gallon of water per 1000 sq. ft. Celsius is not stable in a slurry, so no slurry is made of this mixture. Do not use this mixture on St Augustine or Bahia grasses or severe injury/death will occur. Read and follow all label directions.

Broadleaf weed control in Bahia and Seashore Paspalum are typically performed using Change UP Herbicide at 0.75 ounces per 1000 sq. ft. Do not use on St. Augustine or injury/death will occur.

### WEED MANAGEMENT PROTOCOL

In Florida and Louisiana, post-emergence weed control is only performed using a back pack sprayer or out of the weed control injector, which only trucks built in 2010 - 2019 possess. We do not ever perform post-emergence weed control out of a drop tank (in Florida and Louisiana). There are a number of reasons for this. These products work best through foliar absorption. 4 or 5 gallons of water per 1000 sq. ft. is too high of water volume and will result in poor weed control and a huge waste of product. Additionally, we have a number of vehicles where the product put into the lawn tank can be transferred into the shrub tank or vice-versa.

**Performing post-emergence weed control (in Florida or Louisiana) from a droptank will result in termination of employment. Additionally, any damage resulting from performing this practice will be paid in full by the Specialist or Manager involved.**

### Backpack Herbicide Applications

Successful backpack applications depend on several key calibration components. Most of them can only be controlled by the applicator. If any one of these components is out of line, the rate of herbicide applied will be incorrect and may result in poor weed control or turfgrass damage.

- **Proper rate of herbicide** – Herbicides and herbicide slurries are formulated to deliver a specific rate of herbicide per 1000 sq. ft. and will be effective if mixed and applied properly. Mix herbicide slurries according to slurry recipes provided. Herbicides and herbicide slurries need to be measured very accurately. Do not use tip and measure containers to measure the product. Use a measuring cup that is capable of measuring 1 ounces of product or less with accuracy.
- **Accurate Water Measurement** – The backpack sprayers have water measurement markings on the back. THESE MEASUREMENTS ARE NOT ACCURATE. Each Lawn Specialist must have a water measuring container that will accurately measure in 1 gallon increments. A clean/clear 2.5 gallon container with measurement markings on the side will work well. These water measuring jugs are acquired through Purchasing. Do not reuse containers that are marked not to reuse.
- **Mixing the Solution** - Make sure the herbicide solution is well agitated in the backpack sprayer. Add ½ of the water to the back pack sprayer before adding the herbicide mix and then add the remaining half of the water. Agitate well before spraying. Pump up the sprayer and spray back into the backpack to ensure the mixture has circulated through the pressure chamber. Agitate periodically while making applications.
- **Proper walking speed** - Walking speed is 2.6 MPH, or 40 ft./10 sec. Walking too fast will result in a low dose and poor weed control. Walking too slow will result in a high dose and may cause turfgrass damage.
- **Proper pressure** – The backpack sprayer is designed to supply a maximum pressure of 40 psi when pumped to full capacity. Continuous pumping of the pressure bar is necessary to maintain 40 psi during the course of an application. Allowing the pressure to lessen will result in a lower rate of herbicide and poor control of weeds.
- **Proper nozzle size** – The spray nozzle for making weed control applications, whether the backpack or weed injector, is the 11010. Using the wrong tip size would result in poor weed control or turf injury.

### WEED MANAGEMENT PROTOCOL

- **Proper nozzle height from the ground** – The tip of the flat-fan nozzle should be held parallel to and 20 in. above the ground. This height gives an application swath of approximately 42 in. (3.5 ft.). Holding the nozzle higher will result in poor coverage and poor weed control. Holding the nozzle lower will result in a greater amount of herbicide being applied per square foot and may damage turfgrass.

#### **Backpack Applicator Calibration for Proper Applications**

Keeping track of proper walking speed, pressure, proper overlap and nozzle height all at once takes some coordination and practice. A manager must check application technique on a regular basis with all Specialists to make sure the proper calibration components listed above become and stay habitual. A clean backpack has not previously been used can be used for pesticide application must be used as a practice backpack.

- Mark off an area that is 40 feet long by 25 feet wide (1000 sq. ft).
- Tie a 20 in. string to the end of the nozzle with washers or nuts to weigh the end of the sting.
  - Ensure that the string is 20 inches from the nozzle to the bottom of the weights.
- Calibration Procedure: Calibration is performed using the “displacement” method. (Water is added to the backpack applicator until it is completely full before the application is done. After the application has been completed, whatever water can be added back into the backpack, to fill it to the same point before the application was done, is the amount of water that has been used in the application.)
  - Fill the backpack with water.
  - Pump up the pressure chamber and spray back into the backpack. When the pressure chamber is completely circulated and all the air is removed, stop spraying.
  - Pump up the pressure chamber again until full pressure is reached.
  - Continue to add water until *completely full*.
- Make the application to the 1000 sq. ft. area as instructed below:
  - Time the walking pace of each pass with a stop watch. It should take 10 seconds to travel 40 feet.
  - Be sure that during the application, the weight at the bottom of the nozzle string barely or almost touches the ground.
  - Be sure that full pressure is maintained at all times during the application.
  - Each pass should overlap the last spray pattern by 6 to 8 inches.
- Check the volume of water that has been applied to the 1000 sq. ft. area:
  - Have the Lawn Specialist re-pressurize the backpack and set the backpack on the ground. Remove the backpack lid.
  - Measure 1 gallon of water in a clean/clear 2.5 gallon container.
  - Pour the gallon of water back into the backpack sprayer until it is full like it was before the application was performed.
  - Measure any water that remains from the one gallon.
    - If 16 ounces or less remains, the application is fine. It should be assumed that a Lawn Specialist may slow their pace slightly when walking through thick grass or by the end of the day.
    - If the gallon of water does not refill the backpack, too much material has been applied. If more than 16 ounces additional has been applied, this is not acceptable and the Specialist must be recalibrated.

### WEED MANAGEMENT PROTOCOL

The tanker injector application is performed the same as the backpack application in terms of wand height, walking speed and spray tip size. It is designed to address the need of mixing multiple backpacks on a single property as well as to reduce the likelihood of measuring errors of product(s) added to a backpack.

Consider that each GreenUP vehicle is required to have 3 backpack sprayers. One backpack is designated for broadleaf weed control and one backpack is designated for insect and disease. The third backpack is designated for either broadleaf weed control for a different grass type or possibly grassy weed control for turf types other than St. Augustine. Since we also need to control sedgeweeds, a fourth applicator is often necessary. For this reason, a low volume injector was added to all lawn care vehicles since 2010. An excellent use of this tanker is for sedgeweed control, but it is not limited to this purpose. More information regarding the tanker injector can be found in the GreenUP Protocol “Tanker Injector Applications”. Calibration of the injector according to the protocol is imperative.

The Lawn Specialist must make all post-emergent weed control applications as outlined above. The amount of weed control material applied remains the same regardless of the quantity or type of weeds present. Turf injury will result from over application. More information on post-emergent weed control applications may be found in the “Liquid Spot Treatment” protocol.

#### Difficult-to-control Weeds and Proper Follow-ups

Some weeds are more difficult to control than others and may require follow-up treatments. If a problem controlling weeds occurs, complete the following steps:

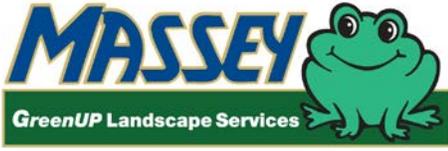
- Ensure enough time has been given for control to be achieved. Two to four weeks may be needed for complete control to be achieved. Do not retreat with the slurry containing Manor/Blade (SBM2) before four weeks have passed.
- Ensure that all calibration components are being carried out properly and that the slurry is being mixed properly.
- Re-treat using the proper weed control material. ***Do not apply herbicides to stressed turfgrass areas.***
- *If after 2 consecutive proper backpack applications, significant decline of target weed(s) has not occurred, contact the GreenUP Technical Department for further guidance.*

Some of the more difficult-to-control weeds are Dollarweed, Beggarweed, Spurge, Virginia Buttonweed, and Chamberbitter.

## WEED MANAGEMENT PROTOCOL

**Table 2: Herbicide chemistry, mode of action, and symptomology.**

Herbicide	Chemical Class	Mode of Action	Symptoms	Damage Timeline
<b>Quicksilver</b> (Contact)	Not assigned	Protox inhibitor – lipid peroxidation (damages cell walls)	Necrosis	24 hours
<b>Blade (Manor)</b> (Systemic)	Sulfonylurea	Meristemic inhibitor (Kills plant from growing point)	Yellowing/necrosis	Slowly kills 1 – 4 weeks. Stunting, shortened internodes, Red to purple color, Absorbed by roots and shoots. Chlorosis and necrosis progresses from growing point to rest of plant
<b>Dismiss</b> (Sulfentrazone) (Contact with soil activity)	Aryl Triazolinone	Photosynthesis inhibitor	Yellowing, necrosis, and death.	2 days to 1 week
<b>0-0-7 + Atrazine</b> (Systemic)	Triazine	Photosynthesis Inhibitor	Interveinal chlorosis, then desiccation. Leaves die in inward direction from margins and tips. Yellowing/necrosis of lower outer leaves first	Soil (primary) and foliar activity. Speed of activity depends on growth rate of plant. 2 – 6 weeks. Residual control up to 3 months.
<b>Three-Way Ester</b> MCPA Triclopyr Dicamba	<u>Auxins</u> Phenoyaliphatic acid Picolinic Acid Benzoic Acid	Growth Regulators	Bending and twisting of leaves and stems. Later, root formation on stems, misshapen leaves, and malformed roots.	Immediate to several weeks.
<b>Drive</b> (Quinclorac) (Systemic)	Auxin	Not fully understood	Stunting, chlorosis, followed by reddening, necrosis and death.	1 – 3 weeks
<b>Basagran</b> (Bentazon) (Contact)	Benzothiadiazole	Photosynthesis Inhibitor	Yellowing/necrosis	2 – 7 days
<b>Sethoxydim</b> (Systemic)	Cyclohexanedione	Lipid biosynthesis inhibitor	Reddening, tip burn, dieback.	1 – 3 weeks
<b>Glyphosate</b> (Systemic)		Amino Acid Inhibitor	Yellowing of new growth and death.	Several days to weeks
<b>PreM</b> (pendamethalin)	Dinitroailine	Root and shoot inhibitor (interferes with cell division & mitosis)	Sparse, club-shaped roots.	Soil activity only (pre-emergent). Residual control up to 3 months.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

**Topic Category:** Lawn

**Recordable Verifiable Training Hours:** 1.5 to 2 hours

**Objectives:**

- Read and discuss our Weed Management Protocol and to identify many of the basic weed species and the typical conditions in which these weeds flourish.
- Ensure proper understanding by all Specialist of Backpack sprayer use
- **To calibrate every Specialist**
- **To ensure that every Specialist is properly equipped with the correct spray tip on the back pack sprayer, a proper measuring cup that will measure from ½ to 10 ounces, and a clear water measuring jug that will measure from ½ to 2.5 gallons of water.**

**Length of lesson:** 90 to 120 minutes.

**Materials needed:**

- Training Guideline (Below)
- Training Document Weed Management Protocol (GreenUp Protocols\Individual Protocols\Lawn Care Basic Application)
- 25 by 40 foot area marked for calibration
- 2 Clean backpack sprayers in good working condition with 11010 spray tips.
- A weighted string at the end of the spray wand near the nozzle measured at 20 inches long from the end of the wand to the end of the weights at the string.
- Clear 2.5 gallon jug with ½ gallon increments
- 32 ounce measuring cup
- Stop watch to time each pass (10 seconds for each 40-foot pass)
- Collect samples of many of the weeds listed below from the field, if available.

Blanket Crabgrass, Alexandergrass, Goosegrass, Bermudagrass, Annual Jewgrass, Doveweed, Kyllinga sedge, Yellow Nutsedge, Purple Nutsedge, Globe sedge, Virginia Button weed, White Clover, Dichondra, Spurge, Chamber Bitter, Yellow Wood Sorrel, Asiatic Hawksbeard.

- Pre- and Post- tests.

**Training Guidelines:**

- Set up the training area in an area of the office that will minimize disruptions to deliver the protocol training and the 40 by 25-foot area outside for calibration.
- Make sure all calibration materials listed above are readily available for the calibration portion of the training.
- Make copies of the tests and training materials for all Team Members attending.
- Begin the meeting by defining the training topic and handing out the Pre-test
  - Allow a few minutes for Team Members to complete the Pre-test.
  - Collect the pre-test and hand out the Verifiable Training Record Form (VTRF)
- Distribute and review the training materials on Weed Management Protocol.
  - Encourage active participation from all Team Members



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

- Ask probing questions to develop key points
- Encourage group reading and participation
- Perform the demonstration portion of the training
- **Demonstrate** that 1 gallon measured in the 2.5-gallon jug does not equal 1 gallon in the backpack sprayer and the measurements on the backpack sprayer must not be used.
  - Measure 1 gallon of water in the water measuring jug and pour it into the back-pack sprayer.
- Time all Specialists to walk at 40 feet in 10 seconds.
- Perform the displacement method of Backpack Calibration with each Specialist while all Specialists critique.
  - Displacement method of calibration: Fill the backpack full of water, pump up the pressure chamber and spray into the backpack to remove any air from the chamber, refill the backpack until it will not hold any additional water. After the Specialist performs the treatment over the 1000 sq. ft. area, measure the amount of water that can be put back into the sprayer. The amount of water that can be put back into the sprayer is the amount of water that was used over the 1000 sq. ft. area.
  - Time each pass and provide feedback to the Specialist for the time taken to walk each pass.
  - Ensure the proper nozzle height by using the 20-inch weighted string
- After reading and reviewing all materials and performing the backpack calibration, ask questions to verify the lesson has been understood.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

Name \_\_\_\_\_ Date \_\_\_\_\_

#### PRE & POST TEST

1. A dense turfgrass cover competes with weeds for \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
2. Most severe weed problems are a result of \_\_\_\_\_ or \_\_\_\_\_ in the turfgrass canopy or a \_\_\_\_\_.
3. Indicator weeds are indicative of \_\_\_\_\_.
4. Blanket Crabgrass may indicate \_\_\_\_\_.
5. Alexandergrass may indicate \_\_\_\_\_.
6. Goosegrass is may indicate \_\_\_\_\_.
7. T or F Sedgeweeds are controlled with Sedgehammer or ProSedge.
8. White Clover may indicate \_\_\_\_\_.
9. T or F Spurge, Chamber bitter, Florida Pusley and Creeping Beggarweed are summer annual broadleaf weeds.
10. T or F I have been successfully calibrated to perform weed control from the backpack sprayer through the displacement method of calibration. I am properly equipped with two backpack sprayers for weed control, both of which have a 11010-spray tip. I also have a water measuring jug.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

#### Answer Sheet

1. A dense turfgrass cover competes with weeds for space, water, nutrients and sunlight.
2. Most severe weed problems are a result of bare or thinning areas in the turfgrass canopy or a favorable environment for growth.
3. Indicator weeds are indicative of an underlying problem.
4. Blanket Crabgrass may indicate high soil moisture.
5. Alexandergrass may indicate low soil moisture.
6. Goosegrass is may indicate soil compaction or traffic damage.
7.  T or F Sedgeweeds are controlled with Sedgethermer or ProSedge.
8. White Clover may indicate low nitrogen fertility.
9.  T or F Spurge, Chamber bitter, Florida Pusley and Creeping Beggarweed are summer annual broadleaf weeds.
11.  T or F I have been successfully calibrated to perform weed control from the backpack sprayer through the displacement method of calibration. I am properly equipped with two backpack sprayers for weed control, both of which have a 11010-spray tip. I also have a water measuring jug.

### WEED MANAGEMENT PROTOCOL - NGA

Nationally, herbicides comprise approximately 65% of all pesticides applied to lawns. This statistic underscores the fact that consumers want and expect to have relatively weed-free lawns. The best way to prevent weeds from becoming a problem in lawns is to grow a healthy, dense stand of turfgrass by providing proper fertilization, irrigation, mowing, and management of insect pests and diseases. Pre-emergent herbicide applications applied before weed germination can reduce the appearance of seasonal weeds significantly. Even under the best circumstances, however it is likely that the need for post-emergent herbicide applications will eventually arise in order to keep weeds suppressed and achieve an acceptable level of customer satisfaction.

#### Objectives

- Discuss the relationship between underlying issues causing turf decline and weeds;
- Setting customer expectations for weed control;
- Provide details on pre-emergent and post-emergent weed control applications;
- Discuss how to handle difficult-to-control weeds and follow-ups;
- Review how to make herbicide applications using a backpack sprayer;
- **Calibrate each Specialist as per the directions below;**

#### Underlying issues and weeds

Because soils contain a lot of weed seeds, there is inherently a high possibility that lawns will eventually get weeds. A dense canopy of turfgrass not only reduces the amount of sunlight reaching the soil surface reducing weed seed germination, but can out-compete most weeds trying to get established for water, space and nutrients. Most severe weed infestations are a result of bare or thinning areas in the turfgrass canopy, or a favorable environment for growth. There are many potential causes of these weed-prone areas in lawns including:

- Drought damage from poor irrigation distribution uniformity or scheduling during dry periods
- Wet conditions (heavy rainfall, over-irrigation, poor drainage)
- Damage from nematodes, insects and/or diseases
- Poor fertility
- Soil pH out of range for the particular turf species
- Poor shade adaptation

#### Indicator Weeds

Certain weeds can thrive in conditions which often cause turfgrasses to fail. When these weeds become established in areas of drought, excessive moisture, poor fertility, low or high soil pH, nematode damage, or anywhere turfgrasses are failing, they are referred to as *indicator weeds* because they are indicative of an underlying condition. Until the condition is alleviated, it is unlikely that the turfgrass will be able to recover and out-compete the weeds, even with herbicide applications. **Once established, indicator weeds often continue to grow even when the underlying condition is corrected.**

**WEED MANAGEMENT PROTOCOL - NGA**

These are some of the most common indicator weeds and the conditions in which they thrive:



**\*\*Blanket crabgrass** – high soil moisture



**\*\*Alexandergrass** – Low soil moisture



**\*\*Annual Bluegrass** – Winter annual grassy weed



**\*\*Goosegrass** – Compacted soil. Common in traffic damaged areas.



**\*\*Annual Woodsgrass** – Low light



**\*\*\*Doveweed** – High moisture and low light

In Tall Fescue, most grassy weeds can be controlled with Drive XLR8 plus Methylated Seed oil.  
In Zoysia and Bermuda, most grassy weeds can be controlled with Celsius plus Dismiss.

**WEED MANAGEMENT PROTOCOL - NGA**

**Sedges**



**Kyllinga sedge** – High soil moisture



**Yellow Nutsedge**



**\*\*Purple Nutsedge** – Disturbed soil



**Globe Sedge** High soil moisture, nematodes

Sedge weeds are controlled with our Sedgehammer slurry **OR** Celsius plus Dismiss application.



**WEED MANAGEMENT PROTOCOL - NGA**

**Perennial Broadleaf Weeds**



**Dollarweed** – High soil moisture



**Virginia Button Weed** – High moisture



**White Clover** – Low nitrogen fertility



**Purple Wood Sorrel** – Thrives in cool weather



**Yellow Wood Sorrel** -  
Thrives in the spring  
Revised 9-21 WM



**Dichondra** – Moist soil

**WEED MANAGEMENT PROTOCOL - NGA**

Summer Annual Broadleaf Weeds



**Spurge** – Drought and nematodes



**Chamber Bitter**



**Florida Pusley** – Drought



**Beggarweed** – Low soil fertility, drought

**In our Cool Season Turf varieties;** Speed Zone plus a wetting agent are used to control broadleaf weeds when temperatures are warm. Speed Zone will not work well when temperatures are below 40 degrees.

**In our Warm Season Turf varieties;** Celsius plus Dismiss are used to control broadleaf weeds when temperatures are warm.



**WEED MANAGEMENT PROTOCOL - NGA**

Winter Annual Broadleaf Weeds



**Heartleaf Drymary** – Moist areas



**Asiatic Hawksbeard** – Areas of thin turf



**Carolina Geranium**



**Common Chick weed**

Cool Power plus a wetting agent is used to control broadleaf weeds when temperatures are cool. Cool Power can volatilize and cause damage to shrubbery when temperatures are warm.

### WEED MANAGEMENT PROTOCOL - NGA

#### Setting Customer Expectations for Weed Control

Many homeowners expect that when they hire a lawn care company, there should never be ANY weeds in the lawn. A thick, healthy lawn with proper irrigation and cultural practices will have very few weeds overall (< 5% coverage), but may be prone to getting more weeds (up to 10%) at certain times of the year. Higher weed levels indicate underlying problems as discussed above.

Seasonal flushes of weeds occur twice per year – spring (summer annuals) and fall (winter annuals). Pre-emergent herbicides are applied twice per year beforehand to reduce weed seed germination. Though these applications help keep weeds to a manageable level, noticeable increases in weed populations still occur during the onset of warmer and cooler weather.

When weed fluctuations occur, our herbicide applications reduce the weed populations back down again, however some weed seeds can germinate in between services if conditions are still conducive. Follow-up treatments may be required depending on weather conditions and weed species present.

#### Types of Herbicides

##### Pre-emergence Herbicides

Pre-emergence herbicides create a chemical barrier in the upper soil profile. As weed seeds germinate, the new seedling is killed as it reaches this barrier. Pre-emergence herbicides need to be moved into the soil profile with rainfall or irrigation; ¼ inch is sufficient.

Our programs utilize Resolute (Prodiamine), Dimension, and Pendimethalin for pre-emergent weed control. Resolute, Dimension and Pendimethalin inhibit root growth of the germinating seed. Dimension also provides post-emergence control of seedling crabgrass.

Pre-emergence herbicides can be damaging to the desirable turfgrasses when over applied.

Follow these instructions when making pre-emergence herbicide applications

- **Calibrate spray equipment and perform a bucket check before making applications.**
- **Newly installed sod should be mowed at least 4 times and be well rooted before application.**
- **Do not apply pre-emergence to stressed or damaged areas.**
- **Do not make more than one pre-emergence herbicide application within at least 90 days unless specifically directed by GreenUP Protocol.**
  - **It is critically important that attention be paid to our GreenUP Protocols for new or regular services as they relate to pre-emergence herbicide applications to avoid an additional pre-emergence herbicide application.**
  - **It is critically important that attention be paid to turfgrass retreatments during the time of year when pre-emergence herbicides are being applied with liquid broadcast applications. Pre-emergence herbicides cannot be present in the droptank during a retreatment using the droptank. Otherwise, an additional pre-emergence herbicide application would result, and turf injury would occur.**

### WEED MANAGEMENT PROTOCOL - NGA

**Pre-emergence herbicide applications must be watered in as soon as possible after application to rinse the active ingredient into the soil and prevent photo-degradation.**

#### Post-emergence Herbicides

Many post-emergence herbicides contain multiple active ingredients. Herbicides from different chemical classes have different modes of action, often cause different symptoms, and have different timelines for weed damage. When mixed together, herbicides can be more effective than when applied alone. This is known as a *synergistic* effect. Detailed information on some common herbicides can be found in Table 2 including chemical class, mode of action, symptomology, and timeframe in which damage can be expected.

#### Backpack Herbicide Applications

Successful backpack applications depend on several key calibration components. Most of them can only be controlled by the applicator. If any one of these components is out of line, the rate of herbicide applied will be incorrect and may result in poor weed control or turfgrass damage.

- **Proper rate of herbicide** – Herbicides and herbicide slurries are formulated to deliver a specific rate of herbicide per 1000 sq. ft. and will be effective if mixed and applied properly. Mix herbicide slurries according to slurry recipes provided. Herbicides and herbicide slurries need to be measured very accurately. Do not use tip and measure containers to measure the product. Use a measuring cup that can measure 1 ounce of product or less with accuracy.
- **Accurate Water Measurement** – The backpack sprayers have water measurement markings on the back. **THESE MEASUREMENTS ARE NOT ACCURATE, DO NOT USE THEM.** Each Lawn Specialist must have a water measuring container that will accurately measure in 1 gallon increments. A clean/clear 2.5 gallon container with measurement markings on the side will work well. These water measuring jugs are acquired through Purchasing. Do not reuse containers that are marked not to reuse. This is a violation of law.
- **Mixing the Solution** - Make sure the herbicide solution is well agitated in the backpack sprayer. Add ½ of the water to the backpack sprayer before adding the herbicide mix and then add the remaining half of the water. Agitate well before spraying. Pump up the sprayer and spray back into the backpack to ensure the mixture has circulated through the pressure chamber. Agitate periodically while making applications.
- **Proper walking speed** - Walking speed is 2.6 MPH, or 40 ft./10 sec. Walking too fast will result in a low dose and poor weed control. Walking too slow will result in a high dose and may cause turfgrass damage.
- **Proper pressure** – The backpack sprayer is designed to supply a maximum pressure of 40 psi when pumped to full capacity. Continuous pumping of the pressure bar is necessary to maintain 40 psi during the course of an application. Allowing the pressure to lessen will result in a lower rate of herbicide and poor control of weeds.
- **Proper nozzle size** – The spray nozzle for making weed control applications, whether the backpack or weed injector, is the 11010. Using the wrong tip size would result in poor weed control or turf injury.
- **Proper nozzle height from the ground** – The tip of the flat-fan nozzle should be held parallel to and 20 in. above the ground. This height gives an application swath of

### WEED MANAGEMENT PROTOCOL - NGA

approximately 42 in. (3.5 ft.). Holding the nozzle higher will result in poor coverage and poor weed control. Holding the nozzle lower will result in a greater amount of herbicide being applied per square foot and may damage turfgrass.

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  - Fill the backpack with water.
  - Pump up the pressure chamber and spray back into the backpack. When the pressure chamber is completely circulated and all the air is removed, stop spraying.
  - Pump up the pressure chamber again until full pressure is reached.
  - Continue to add water until *completely full*.
- Make the application to the 1000 sq. ft. area as instructed below:
  - Time the walking pace of each pass with a stop watch. It should take 10 seconds to travel 40 feet.
  - Be sure that during the application, the weight at the bottom of the nozzle string barely or almost touches the ground.
  - Be sure that full pressure is maintained at all times during the application.
  - Each pass should overlap the last spray pattern by 6 to 8 inches.
- Check the volume of water that has been applied to the 1000 sq. ft. area:
  - Have the Lawn Specialist re-pressurize the backpack and set the backpack on the ground. Remove the backpack lid.
  - Measure 1 gallon of water in a clean/clear 2.5 gallon container.
  - Pour the gallon of water back into the backpack sprayer until it is full like it was before the application was performed.
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### WEED MANAGEMENT PROTOCOL - NGA

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Some weeds are more difficult to control than others and may require follow-up treatments. If a problem controlling weeds occurs, complete the following steps:

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- Ensure that all calibration components are being carried out properly and that the slurry is being mixed properly.
- Re-treat using the proper weed control material. ***Do not apply herbicides to stressed turfgrass areas.***
- *If after 2 consecutive proper backpack applications, significant decline of target weed(s) has not occurred, contact the GreenUP Technical Department for further guidance.*

Some of the more difficult-to-control weeds are Dollarweed, Beggarweed, Spurge, Virginia Buttonweed, and Chamberbitter.

## WEED MANAGEMENT PROTOCOL - NGA

**Table 2: Herbicide chemistry, mode of action, and symptomology.**

Herbicide	Chemical Class	Mode of Action	Symptoms	Damage Timeline
<b>Quicksilver</b> (Contact)	Not assigned	Protox inhibitor – lipid peroxidation (damages cell walls)	Necrosis	24 hours
<b>Blade (Manor)</b> (Systemic)	Sulfonylurea	Meristemic inhibitor (Kills plant from growing point)	Yellowing/necrosis	Slowly kills 1 – 4 weeks. Stunting, shortened internodes, Red to purple color, Absorbed by roots and shoots. Chlorosis and necrosis progresses from growing point to rest of plant
<b>Dismiss</b> (Sulfentrazone) (Contact with soil activity)	Aryl Triazolinone	Photosynthesis inhibitor	Yellowing, necrosis, and death.	2 days to 1 week
<b>0-0-7 + Atrazine</b> (Systemic)	Triazine	Photosynthesis Inhibitor	Interveinal chlorosis, then desiccation. Leaves die in inward direction from margins and tips. Yellowing/necrosis of lower outer leaves first	Soil (primary) and foliar activity. Speed of activity depends on growth rate of plant. 2 – 6 weeks. Residual control up to 3 months.
<b>Three-Way Ester</b> MCPA Triclopyr Dicamba	<u>Auxins</u> Phenoyaliphatic acid Picolinic Acid Benzoic Acid	Growth Regulators	Bending and twisting of leaves and stems. Later, root formation on stems, misshapen leaves, and malformed roots.	Immediate to several weeks.
<b>Drive</b> (Quinclorac) (Systemic)	Auxin	Not fully understood	Stunting, chlorosis, followed by reddening, necrosis and death.	1 – 3 weeks
<b>Basagran</b> (Bentazon) (Contact)	Benzothiadiazole	Photosynthesis Inhibitor	Yellowing/necrosis	2 – 7 days
<b>Sethoxydim</b> (Systemic)	Cyclohexanedione	Lipid biosynthesis inhibitor	Reddening, tip burn, dieback.	1 – 3 weeks
<b>Glyphosate</b> (Systemic)		Amino Acid Inhibitor	Yellowing of new growth and death.	Several days to weeks
<b>PreM</b> (pendamethalin)	Dinitroailine	Root and shoot inhibitor (interferes with cell division & mitosis)	Sparse, club-shaped roots.	Soil activity only (pre-emergent). Residual control up to 3 months.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

**Topic Category:** Lawn

**Recordable Verifiable Training Hours:** 1.5 to 2 hours

**Objectives:**

- Read and discuss our Weed Management Protocol and to identify many of the basic weed species and the typical conditions in which these weeds flourish.
- Ensure proper understanding by all Specialist of Backpack sprayer use
- **To calibrate every Specialist**
- **To ensure that every Specialist is properly equipped with the correct spray tip on the back pack sprayer, a proper measuring cup that will measure from ½ to 10 ounces, and a clear water measuring jug that will measure from ½ to 2.5 gallons of water.**
- It is also designed to ensure that everyone in Florida and Louisiana understands that we do not put post emergence herbicides into the drop tank. They used from the back pack sprayer only. This training will be used to document the fact that your Specialist know that if they use the post emergence materials from the drop tank, it could result in termination of employment and damage results, they will be paying for the damage.

**This meeting will qualify for 1 hour of Department of Ag ID Cardholder Training. Make sure you fill out the Department of Ag ID Cardholder Training form for each Team Member. Keep a copy in the Team Members training file at your office.**

**KEEP A COPY OF THE GRADED POST TEST IN THE TEAM MEMBER'S TRAINING FILE AS DOCUMENTATION THAT THE TEAM MEMBER UNDERSTANDS OUR POLICY OF USING THE WEED CONTROL SLURRIES ONLY FROM A BACKPACK SPRAYER.**

**Length of lesson:** 90 to 120 minutes.

**Materials needed:**

- Training Guideline (Below)
- Training Document Weed Management Protocol (GreenUp Protocols\Individual Protocols\Lawn Care Basic Application)
- 25 by 40 foot area marked for calibration
- 2 Clean backpack sprayers in good working condition with 11010 spray tips.
- A weighted string at the end of the spray wand near the nozzle measured at 20 inches long from the end of the wand to the end of the weights at the string.
- Clear 2.5 gallon jug with ½ gallon increments
- 32 ounce measuring cup
- Stopwatch to time each pass (10 seconds for each 40 foot pass)
- Collect samples of many of the weeds listed below from the field, if available.

Blanket Crabgrass, Alexandergrass, Goosegrass, Bermudagrass, Annual Jewgrass, Doveweed, Kyllinga sedge, Yellow Nutsedge, Purple Nutsedge, Globe sedge, Virginia Button weed, White Clover, Dichondra, Spurge, Chamber Bitter, Yellow Wood Sorrel, Asiatic Hawksbeard.

- Pre- and Post- tests.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

#### Training Guidelines:

- Set up the training area in an area of the office that will minimize disruptions to deliver the protocol training and the 40 by 25 foot area outside for calibration.
- Make sure all calibration materials listed above are readily available for the calibration portion of the training.
- Make copies of the tests and training materials for all Team Members attending.
- Hand out the Department of Ag ID Cardholder Training Form and have all Cardholder complete the form. The training must be a minimum of 60 minutes to qualify.
- Begin the meeting by defining the training topic and handing out the Pre-test
  - Allow a few minutes for Team Members to complete the Pre-test.
  - Collect the pre-test and hand out the Verifiable Training Record Form (VTRF)
- Distribute and review the training materials on Weed Management Protocol.
  - Encourage active participation from all Team Members
  - Ask probing questions to develop key points
  - Encourage group reading and participation
- Perform the demonstration portion of the training
- **Demonstrate** that 1 gallon measured in the 2.5 gallon jug does not equal 1 gallon in the backpack sprayer and the measurements on the backpack sprayer must not be used.
  - Measure 1 gallon of water in the water measuring jug and pour it into the back pack sprayer.
- Time all Specialists to walk at 40 feet in 10 seconds.
- Perform the displacement method of Backpack Calibration with each Specialist while all Specialists critique.
  - Displacement method of calibration: Fill the backpack full of water, pump up the pressure chamber and spray into the backpack to remove any air from the chamber, refill the backpack until it will not hold any additional water. After the Specialist performs the treatment over the 1000 sq. ft. area, measure the amount of water that can be put back into the sprayer. The amount of water that can be put back into the sprayer is the amount of water that was used over the 1000 sq. ft. area.
  - Time each pass and provide feedback to the Specialist for the time taken to walk each pass.
  - Ensure the proper nozzle height by using the 20 inch weighted string
- After reading and reviewing all materials and performing the backpack calibration, ask questions to verify the lesson has been understood.
- Hand out the Post-tests. When complete, grade the tests and record the score on the VTRF.
- Collect tests and place with the verifiable materials in the Service Center Verifiable Training File.
- Make copies of the VTRF and place in each Team Member's training file.
- Complete all Weekly VTM's through Massey University.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

Name \_\_\_\_\_ Date \_\_\_\_\_

#### PRE & POST TEST

1. T or F A dense turfgrass cover competes with weeds for space, water, nutrients and light.
2. T or F Most severe weed problems are a result of bare or thinning areas in the turfgrass canopy or a favorable environment for growth.
3. T or F Indicator weeds are indicative of an underlying problem.
4. Blanket Crabgrass may indicate
  - a. high soil moisture.
  - b. Low moisture.
  - c. Low light.
  - d. Excessive nitrogen.
5. Alexandergrass may indicate
  - a. high soil moisture.
  - b. Low moisture.
  - c. Low light.
  - d. Excessive nitrogen.
6. T or F Goosegrass is may indicate soil compaction or traffic damage.
7. T or F Doveweed can be controlled with granular Atrazine or Auguzine in St. Augustinegrass.
8. T or F Purple Nutsedge can be controlled with Basagran.
9. White Clover may indicate
  - a. Excessive nitrogen
  - b. Compacted soil
  - c. Nitrogen deficiency
  - d. Loose soil.
10. T or F Spurge, Chamber bitter, Florida Pusley and Creeping Beggarweed are summer annual broadleaf weeds.
11. T or F Performing post-emergent weed control out of a drop tank will result in termination of the Specialist performing the treatment (except when scheduled in North Georgia).



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

12. T or F Any damage resulting from performing post-emergent weed control out of a drop tank will result in the Specialist paying for any resulting damage in full (except when scheduled in North Georgia).
13. T or F I have been successfully calibrated to perform weed control from the backpack sprayer through the displacement method of calibration. I am properly equipped with two backpack sprayers for weed control, both of which have a 11010 spray tip. I also have a water measuring jug.



## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

#### Answer Sheet

1.  T or F A dense turfgrass cover competes with weeds for space, water, nutrients and light.
2.  T or F Most severe weed problems are a result of bare or thinning areas in the turfgrass canopy or a favorable environment for growth.
3.  T or F Indicator weeds are indicative of an underlying problem.
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## WEEKLY TRAINING SESSION



### Weed Management Protocol and Backpack Sprayer Calibration

12.  T or F Any damage resulting from performing post-emergent weed control out of a drop tank will result in the Specialist paying for any resulting damage in full (except when scheduled in North Georgia).
13.  T or F I have been successfully calibrated to perform weed control from the backpack sprayer through the displacement method of calibration. I am properly equipped with two backpack sprayers for weed control, both of which have a 11010 spray tip. I also have a water measuring jug.

### WEED MANAGEMENT PROTOCOL

Nationally, herbicides comprise approximately 65% of all pesticides applied to lawns. This statistic underscores the fact that consumers want and expect to have relatively weed-free lawns. The best way to prevent weeds from becoming a problem in lawns is to grow a healthy, dense stand of turfgrass by providing proper fertilization, irrigation, mowing, and management of insect pests and diseases. Pre-emergent herbicide applications applied before weed germination can reduce the appearance of seasonal weeds significantly. Even under the best circumstances, however it is likely that the need for post-emergent herbicide applications will eventually arise in order to keep weeds suppressed and achieve an acceptable level of customer satisfaction.

#### Objectives

- Discuss the relationship between underlying issues causing turf decline and weeds;
- Setting customer expectations for weed control;
- Provide details on pre-emergent and post-emergent weed control applications;
- Discuss how to handle difficult-to-control weeds and follow-ups;
- Review how to make herbicide applications using a backpack sprayer;
- **Calibrate each Specialist as per the directions below;**
- Ensure that we have documentation to show that all Managers and Specialists understand that performing weed control using our post-emergent weed control slurries out of a drop tank is a terminable offense and any damage resulting from this practice will also result in the Specialist paying for the full amount of any resulting damage.

#### Underlying issues and weeds

Because soils have a lot of weed seeds already in them, there is inherently a high possibility that lawns will eventually get weeds. A dense canopy of turfgrass not only reduces the amount of sunlight reaching the soil surface reducing weed seed germination, but can out-compete most weeds trying to get established for water, space and nutrients. Most severe weed infestations are a result of bare or thinning areas in the turfgrass canopy, or a favorable environment for growth. There are many potential causes of these weed-prone areas in lawns including:

- Drought damage from poor irrigation distribution uniformity or scheduling during dry periods
- Wet conditions (heavy rainfall, over-irrigation, poor drainage)
- Damage from nematodes, insects and/or diseases
- Poor fertility
- Soil pH out of range for the particular turf species
- Poor shade adaptation

#### Indicator Weeds

Certain weeds can thrive in conditions which often cause turfgrasses to fail. When these weeds become established in areas of drought, excessive moisture, poor fertility, low or high soil pH, nematode damage, or anywhere turfgrasses are failing, they are referred to as *indicator weeds* because they are indicative of an underlying condition. Until the condition is alleviated, it is unlikely that the turfgrass will be able to recover and out-compete the weeds, even with herbicide applications. Once established, indicator weeds often continue to grow even when the underlying condition is corrected.

**WEED MANAGEMENT PROTOCOL**

These are some of the most common indicator weeds and the conditions in which they thrive:



**\*\*Blanket crabgrass** – high soil moisture



**\*\*Alexandergrass** – Low soil moisture



**\*\*Bermudagrass** – Often takes over drought damaged areas, but will also flourish in high moisture.



**\*\*Goosegrass** – Compacted soil. Common in traffic damaged areas.



**\*\*Annual Woodsgrass** – Low light



**\*\*\*Doveweed** – High moisture and low light

**\*\*These weeds are grassy weeds and have no selective control in St. Augustinegrass. Spot killing with a non-selective herbicide and renovation is needed.**

**\*\*\*Doveweed can be controlled with granular Atrazine or Auguzine in St. Augustinegrass. In Zoysiagrass or Bermudagrass, Doveweed can be controlled with the Celsius/Dismiss South combination (below).**

**WEED MANAGEMENT PROTOCOL**

Sedges



**Kyllinga sedge** – High soil moisture



**Yellow Nutsedge**



**\*\*Purple Nutsedge** – Disturbed soil  
Purple Nutsedge is controlled with Sedgehammer  
Basagran does not control Purple Nutsedge.



**Globe Sedge** High soil moisture, nematodes

**Perennial Broadleaf Weeds**



**Dollarweed** – High soil moisture



**Virginia Button Weed** – High moisture

**WEED MANAGEMENT PROTOCOL**



**White Clover** – Low nitrogen fertility



**Purple Wood Sorrel** – Thrives in cool weather



**Yellow Wood Sorrel** -  
Thrives in the spring



**Dichondra** – Moist soil

**Summer Annual Broadleaf Weeds**



**Spurge** – Drought and nematodes



**Chamber Bitter** – Loose soil



**WEED MANAGEMENT PROTOCOL**

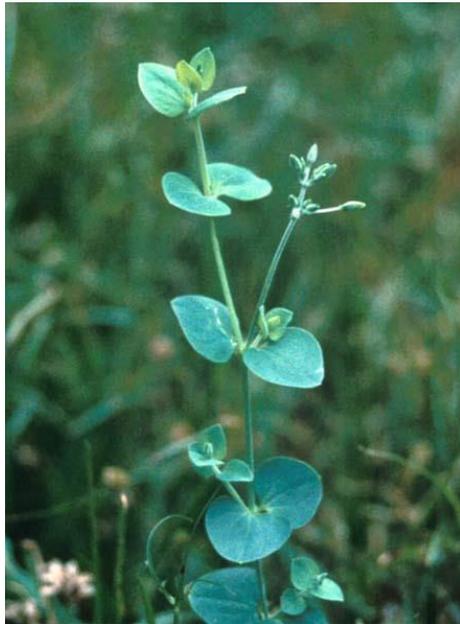


**Florida Pusley** – Drought



**Beggarweed** – Low soil fertility, drought

**Winter Annual Broadleaf Weeds**



**Heartleaf Drymary** – Moist areas



**Asiatic Hawksbeard** – Areas of thin turf



**Carolina Geranium**



**Common Chick weed**

### WEED MANAGEMENT PROTOCOL

#### Setting Customer Expectations for Weed Control

Many homeowners expect that when they hire a lawn care company, there should never be ANY weeds in the lawn. A thick, healthy lawn under proper irrigation will have very few weeds overall (< 5% coverage), but may be prone to getting more weeds (up to 10%) at certain times of the year. Higher weed levels indicate underlying problems as discussed above.

Seasonal flushes of weeds occur twice per year – spring (summer annuals) and fall (winter annuals). Pre-emergent herbicides are applied twice per year beforehand to reduce weed seed germination. Though these applications help keep weeds to a manageable level, noticeable increases in weed populations still occur during the onset of warmer and cooler weather. A higher incidence of Dollarweed, sedge, and crabgrass may occur during periods of high rainfall, or if the soil holds a lot of water due to high organic or clay content.

When weed fluctuations occur, our herbicide applications reduce the weed populations back down again, however some weed seeds can germinate in between services if conditions are still conducive. Follow-up treatments may be required depending on weather conditions and weed species present.

#### Types of Herbicides

##### Pre-emergence Herbicides

Pre-emergence herbicides create a chemical barrier in the upper soil profile. As weed seeds germinate, the new seedling is killed as it reaches this barrier of herbicide. Pendimethalin (Pre-M) or Resolute is used in most of our programs for pre-emergent weed control and lasts from 6 – 8 weeks in the soil profile. It is more effective if followed with ½ inch rainfall or supplemental irrigation. Since Pendimethalin and Resolute are root inhibitors, over-application or application to lawns with compromised roots can cause damage.

Follow these instructions when making applications with Pendimethalin or Resolute

- **Calibrate spray equipment and perform a bucket check before making applications.**
- **New sod should be mowed at least 4 times and be well rooted before application with Specticle, Pendimethalin or Resolute.**
- **Do not apply pre-emergence to stressed or damaged areas.**
- **Do not make more than one pre-emergence herbicide application within at least 90 days unless specifically directed by GreenUP Protocol.**
  - **It is critically important that attention be paid to our GreenUP Protocols for new or regular services as they relate to pre-emergence herbicide applications to avoid an additional pre-emergence herbicide application.**
  - **It is critically important that attention be paid to turfgrass retreatments during the time of year when pre-emergence herbicides are being applied with liquid broadcast applications. Pre-emergence herbicides cannot be present in the droptank during a retreatment using the droptank. Otherwise, an additional pre-emergence herbicide application would result, and turf injury would occur.**

## **WEED MANAGEMENT PROTOCOL**

**Pre-emergence herbicide applications should be watered in as soon as possible after application to rinse the active ingredient into the soil and prevent photo-degradation.**

### **Post-emergence Herbicides**

Herbicides from different chemical classes have different modes of action, often cause different symptoms, and have different timelines for weed damage. When mixed together, herbicides can be more effective than when applied alone. This is known as a *synergistic* effect. Detailed information on some common herbicides can be found in Table 2 including chemical class, mode of action, symptomology, and timeframe in which damage can be expected.

We have two different weed mixtures for broadleaf weeds in St. Augustinegrass. The weed mix we use is dependent on the time of year.

In the cooler months (from November 1 to February 28<sup>th</sup>), SBM1 is used. This slurry contains Basagran, Trimec Bentgrass Formula, Octane and Wetting agent. Auguzine is also added with this mixture to the backpack sprayer, but it is not mixed into the slurry.

In the warm season (from March 1 to October 31<sup>st</sup>) SBM2 is used. This slurry contains Manor/Blade, Trimec Bentgrass Formula, Octane and Wetting agent. Manor can regulate the growth of the desirable grass and should not be used in the cool season when the growth of the desirable grass is already being slowed down due to the cooler temperatures and shorter number of daylight hours.

Each slurry is combined before being issued to the Lawn Specialists by the Service Manager, supervisor or product room supervisor. Each product must be measured very precisely, since it will then be issued for use by all the Lawn Specialists and used on our customer's lawns. The containers used to hold this mixture must be labeled with the appropriate slurry label. These labels can be found on the G: Drive\Shared\Quality Assurance\GreenUp Reference Materials\Slurry Labels-Van Label Sets\Slurry Labels\Current Slurries\Back Pack Slurries\Lawn. The mixing instructions are on the label. Affix the label to a clean bottle with clear packing tape. Make sure the correct label is used depending on the mixture.

Each of these slurries is very effective on a wide variety of broadleaf weeds. When used properly, there will be no doubt that the weeds have been treated within a matter of a few days after treatment. Complete death of the weeds may take two to four weeks. Follow-ups for most broadleaf weeds should not be needed if a perfect application is performed.

From March through September, Broadleaf, sedge and grassy weeds in Zoysia, Bermuda and Centipede are treated with a combination of Celsius and Dismiss South. The rates are 0.11 ounces of Celsius and 0.28 ounces of Dismiss South per gallon of water per 1000 sq. ft. Celsius is not stable in a slurry, so no slurry is made of this mixture. Do not use this mixture on St Augustine or Bahia grasses or severe injury/death will occur. Read and follow all label directions.

Broadleaf weed control in Bahia and Seashore Paspalum are typically performed using Change UP Herbicide at 0.75 ounces per 1000 sq. ft. Do not use on St. Augustine or injury/death will occur.

### WEED MANAGEMENT PROTOCOL

In Florida and Louisiana, post-emergence weed control is only performed using a back pack sprayer or out of the weed control injector, which only trucks built in 2010 - 2019 possess. We do not ever perform post-emergence weed control out of a drop tank (in Florida and Louisiana). There are a number of reasons for this. These products work best through foliar absorption. 4 or 5 gallons of water per 1000 sq. ft. is too high of water volume and will result in poor weed control and a huge waste of product. Additionally, we have a number of vehicles where the product put into the lawn tank can be transferred into the shrub tank or vice-versa.

**Performing post-emergence weed control (in Florida or Louisiana) from a droptank will result in termination of employment. Additionally, any damage resulting from performing this practice will be paid in full by the Specialist or Manager involved.**

### Backpack Herbicide Applications

Successful backpack applications depend on several key calibration components. Most of them can only be controlled by the applicator. If any one of these components is out of line, the rate of herbicide applied will be incorrect and may result in poor weed control or turfgrass damage.

- **Proper rate of herbicide** – Herbicides and herbicide slurries are formulated to deliver a specific rate of herbicide per 1000 sq. ft. and will be effective if mixed and applied properly. Mix herbicide slurries according to slurry recipes provided. Herbicides and herbicide slurries need to be measured very accurately. Do not use tip and measure containers to measure the product. Use a measuring cup that is capable of measuring 1 ounces of product or less with accuracy.
- **Accurate Water Measurement** – The backpack sprayers have water measurement markings on the back. THESE MEASUREMENTS ARE NOT ACCURATE. Each Lawn Specialist must have a water measuring container that will accurately measure in 1 gallon increments. A clean/clear 2.5 gallon container with measurement markings on the side will work well. These water measuring jugs are acquired through Purchasing. Do not reuse containers that are marked not to reuse.
- **Mixing the Solution** - Make sure the herbicide solution is well agitated in the backpack sprayer. Add ½ of the water to the back pack sprayer before adding the herbicide mix and then add the remaining half of the water. Agitate well before spraying. Pump up the sprayer and spray back into the backpack to ensure the mixture has circulated through the pressure chamber. Agitate periodically while making applications.
- **Proper walking speed** - Walking speed is 2.6 MPH, or 40 ft./10 sec. Walking too fast will result in a low dose and poor weed control. Walking too slow will result in a high dose and may cause turfgrass damage.
- **Proper pressure** – The backpack sprayer is designed to supply a maximum pressure of 40 psi when pumped to full capacity. Continuous pumping of the pressure bar is necessary to maintain 40 psi during the course of an application. Allowing the pressure to lessen will result in a lower rate of herbicide and poor control of weeds.
- **Proper nozzle size** – The spray nozzle for making weed control applications, whether the backpack or weed injector, is the 11010. Using the wrong tip size would result in poor weed control or turf injury.

### WEED MANAGEMENT PROTOCOL

- **Proper nozzle height from the ground** – The tip of the flat-fan nozzle should be held parallel to and 20 in. above the ground. This height gives an application swath of approximately 42 in. (3.5 ft.). Holding the nozzle higher will result in poor coverage and poor weed control. Holding the nozzle lower will result in a greater amount of herbicide being applied per square foot and may damage turfgrass.

#### **Backpack Applicator Calibration for Proper Applications**

Keeping track of proper walking speed, pressure, proper overlap and nozzle height all at once takes some coordination and practice. A manager must check application technique on a regular basis with all Specialists to make sure the proper calibration components listed above become and stay habitual. A clean backpack has not previously been used can be used for pesticide application must be used as a practice backpack.

- Mark off an area that is 40 feet long by 25 feet wide (1000 sq. ft).
- Tie a 20 in. string to the end of the nozzle with washers or nuts to weigh the end of the sting.
  - Ensure that the string is 20 inches from the nozzle to the bottom of the weights.
- Calibration Procedure: Calibration is performed using the “displacement” method. (Water is added to the backpack applicator until it is completely full before the application is done. After the application has been completed, whatever water can be added back into the backpack, to fill it to the same point before the application was done, is the amount of water that has been used in the application.)
  - Fill the backpack with water.
  - Pump up the pressure chamber and spray back into the backpack. When the pressure chamber is completely circulated and all the air is removed, stop spraying.
  - Pump up the pressure chamber again until full pressure is reached.
  - Continue to add water until *completely full*.
- Make the application to the 1000 sq. ft. area as instructed below:
  - Time the walking pace of each pass with a stop watch. It should take 10 seconds to travel 40 feet.
  - Be sure that during the application, the weight at the bottom of the nozzle string barely or almost touches the ground.
  - Be sure that full pressure is maintained at all times during the application.
  - Each pass should overlap the last spray pattern by 6 to 8 inches.
- Check the volume of water that has been applied to the 1000 sq. ft. area:
  - Have the Lawn Specialist re-pressurize the backpack and set the backpack on the ground. Remove the backpack lid.
  - Measure 1 gallon of water in a clean/clear 2.5 gallon container.
  - Pour the gallon of water back into the backpack sprayer until it is full like it was before the application was performed.
  - Measure any water that remains from the one gallon.
    - If 16 ounces or less remains, the application is fine. It should be assumed that a Lawn Specialist may slow their pace slightly when walking through thick grass or by the end of the day.
    - If the gallon of water does not refill the backpack, too much material has been applied. If more than 16 ounces additional has been applied, this is not acceptable and the Specialist must be recalibrated.

### WEED MANAGEMENT PROTOCOL

The tanker injector application is performed the same as the backpack application in terms of wand height, walking speed and spray tip size. It is designed to address the need of mixing multiple backpacks on a single property as well as to reduce the likelihood of measuring errors of product(s) added to a backpack.

Consider that each GreenUP vehicle is required to have 3 backpack sprayers. One backpack is designated for broadleaf weed control and one backpack is designated for insect and disease. The third backpack is designated for either broadleaf weed control for a different grass type or possibly grassy weed control for turf types other than St. Augustine. Since we also need to control sedgeweeds, a fourth applicator is often necessary. For this reason, a low volume injector was added to all lawn care vehicles since 2010. An excellent use of this tanker is for sedgeweed control, but it is not limited to this purpose. More information regarding the tanker injector can be found in the GreenUP Protocol “Tanker Injector Applications”. Calibration of the injector according to the protocol is imperative.

The Lawn Specialist must make all post-emergent weed control applications as outlined above. The amount of weed control material applied remains the same regardless of the quantity or type of weeds present. Turf injury will result from over application. More information on post-emergent weed control applications may be found in the “Liquid Spot Treatment” protocol.

#### Difficult-to-control Weeds and Proper Follow-ups

Some weeds are more difficult to control than others and may require follow-up treatments. If a problem controlling weeds occurs, complete the following steps:

- Ensure enough time has been given for control to be achieved. Two to four weeks may be needed for complete control to be achieved. Do not retreat with the slurry containing Manor/Blade (SBM2) before four weeks have passed.
- Ensure that all calibration components are being carried out properly and that the slurry is being mixed properly.
- Re-treat using the proper weed control material. ***Do not apply herbicides to stressed turfgrass areas.***
- *If after 2 consecutive proper backpack applications, significant decline of target weed(s) has not occurred, contact the GreenUP Technical Department for further guidance.*

Some of the more difficult-to-control weeds are Dollarweed, Beggarweed, Spurge, Virginia Buttonweed, and Chamberbitter.

**WEED MANAGEMENT PROTOCOL**

**Table 2: Herbicide chemistry, mode of action, and symptomology.**

<b>Herbicide</b>	<b>Chemical Class</b>	<b>Mode of Action</b>	<b>Symptoms</b>	<b>Damage Timeline</b>
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<b>Dismiss</b> (Sulfentrazone) (Contact with soil activity)	Aryl Triazolinone	Photosynthesis inhibitor	Yellowing, necrosis, and death.	2 days to 1 week
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<b>Three-Way Ester</b> MCPA Triclopyr Dicamba	<u>Auxins</u> Phenoyaliphatic acid Picolinic Acid Benzoic Acid	Growth Regulators	Bending and twisting of leaves and stems. Later, root formation on stems, misshapen leaves, and malformed roots.	Immediate to several weeks.
<b>Drive</b> (Quinclorac) (Systemic)	Auxin	Not fully understood	Stunting, chlorosis, followed by reddening, necrosis and death.	1 – 3 weeks
<b>Basagran</b> (Bentazon) (Contact)	Benzothiadiazole	Photosynthesis Inhibitor	Yellowing/necrosis	2 – 7 days
<b>Sethoxydim</b> (Systemic)	Cyclohexanedione	Lipid biosynthesis inhibitor	Reddening, tip burn, dieback.	1 – 3 weeks
<b>Glyphosate</b> (Systemic)		Amino Acid Inhibitor	Yellowing of new growth and death.	Several days to weeks
<b>PreM</b> (pendamethalin)	Dinitroailine	Root and shoot inhibitor (interferes with cell division & mitosis)	Sparse, club-shaped roots.	Soil activity only (pre-emergent). Residual control up to 3 months.

# The Water Source

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# The Water Source

- Potable
  - Metered
  - Backflow
- Reclaimed
  - Metered
  - Un-metered
- Surface
  - Lake
  - Pond
- Well
  - Shallow Well
  - Deep Well

# Water Meters

- Potable Water Meters



- THEY ARE 5/8" WITH 12 TO 15 GPM MAX
- PRESSURE WILL VARY.

- Reclaimed Water Meters



# Water Meters

- Water Meter Boxes



# Backflow Prevention Device

- There are several different types of backflow devices in use all over Florida.
- What device is used will depend on the local codes. County or city.
- Massey Services is **NOT** a plumbing company and **DOES NOT** have a plumbing license to install **OR REPLACE** backflows in the cities or counties which require them.
- Check local codes with the city the customer lives in before you call me.



# PVB Backflow Preventer



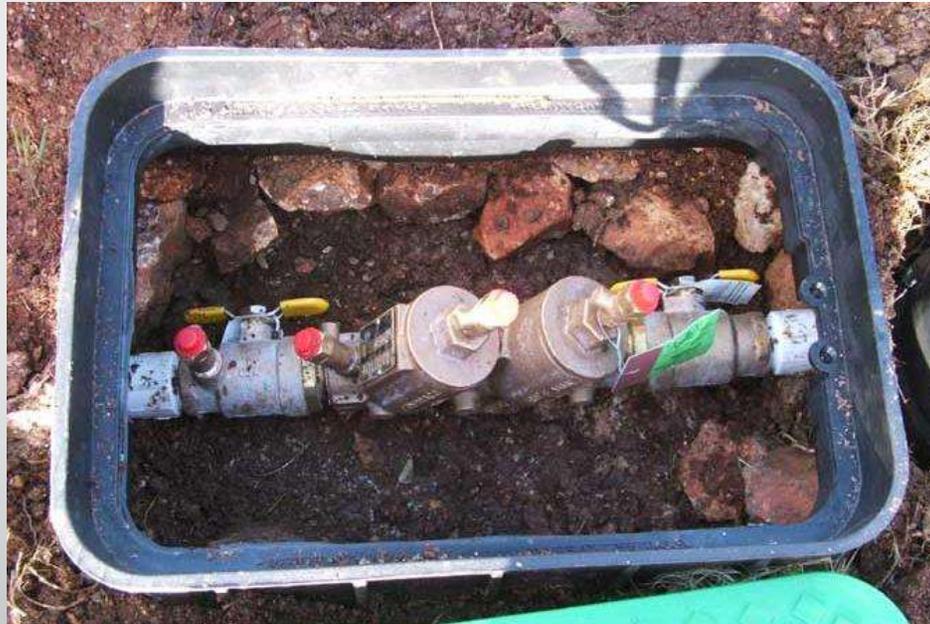
# RPz Backflow Preventer



# AVB Backflow Preventer



# DCA Backflow Preventer



# Pump Types

- standard pump (centrifugal)
- Jet Pump (centrifugal)
- submersible



# Pump Types

- Centrifugal
  - Lake
  - Booster
  - Shallow well

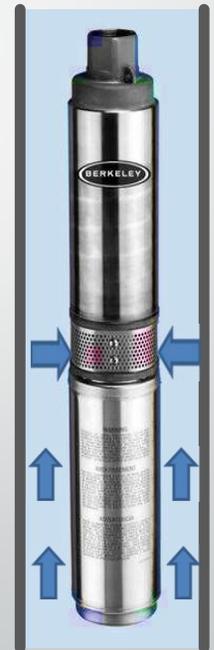


# Pump vs Jet Pump

- Shallow well pumps are the most common we will run in to.
- Most will have a standard pump and not a jet pump.
- A standard pump gives high flow at lower pressure.
- A jet pump gives higher pressure at a lower flow rate.
- The biggest reason we don't see more jet pumps is because they cost more.
- Example: A 1hp jet pump costs more than a 1.5hp standard pump.
- However, at 15gpm a 1.5hp pump will give us 42psi. At 15gpm a 1hp jet pump will give us 49psi. Both at 10' of lift.(water level is 10' down)

# Pump Types

- Deep Well
  - Submersible Pump
  - Note: make sure the pump doesn't also feed the house water!!!!

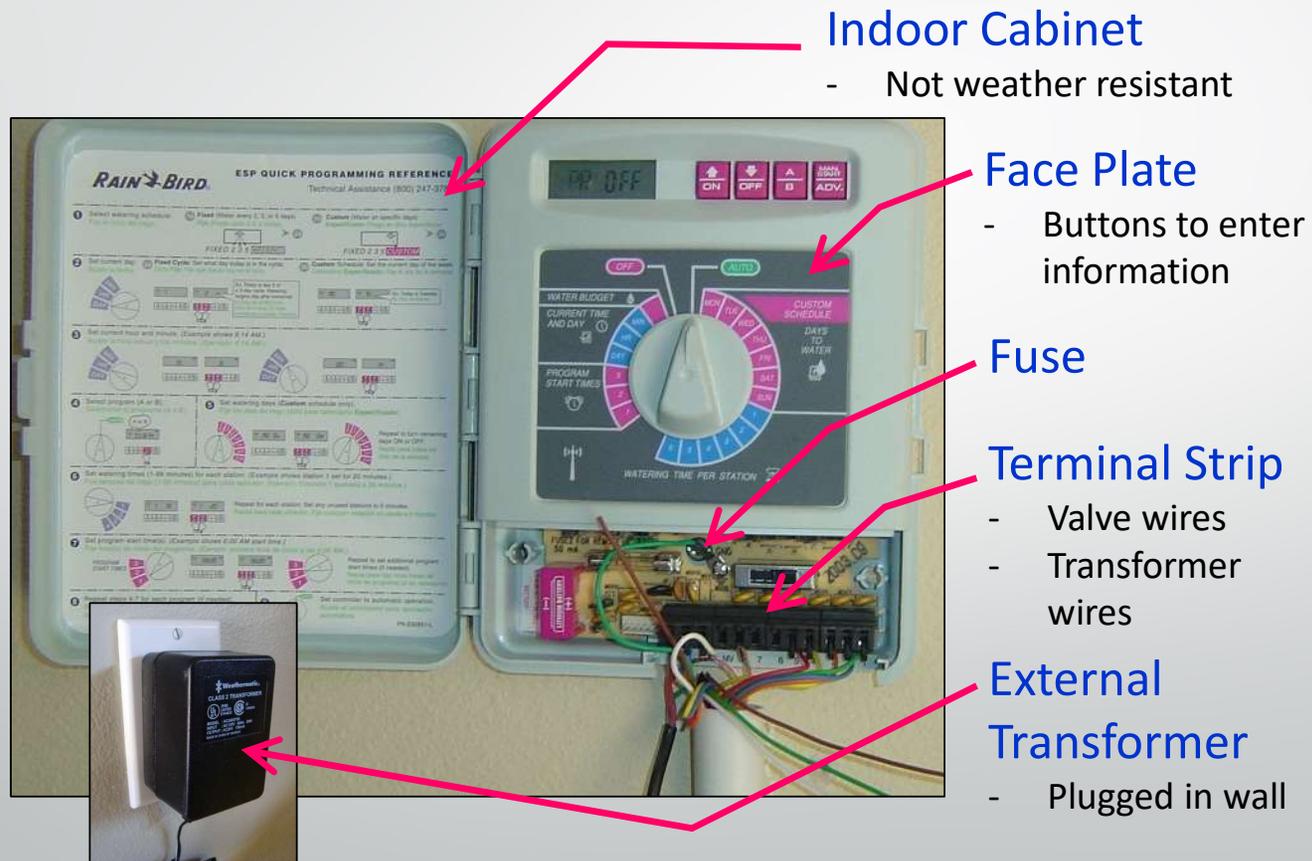


# The Controllers

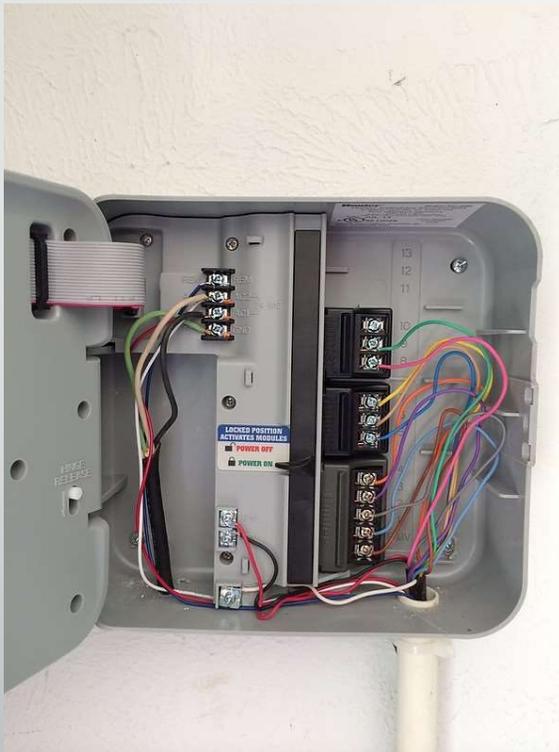
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# Parts of an Indoor Controller



# Hunter Indoor Controllers



# Hunter Outdoor Controllers

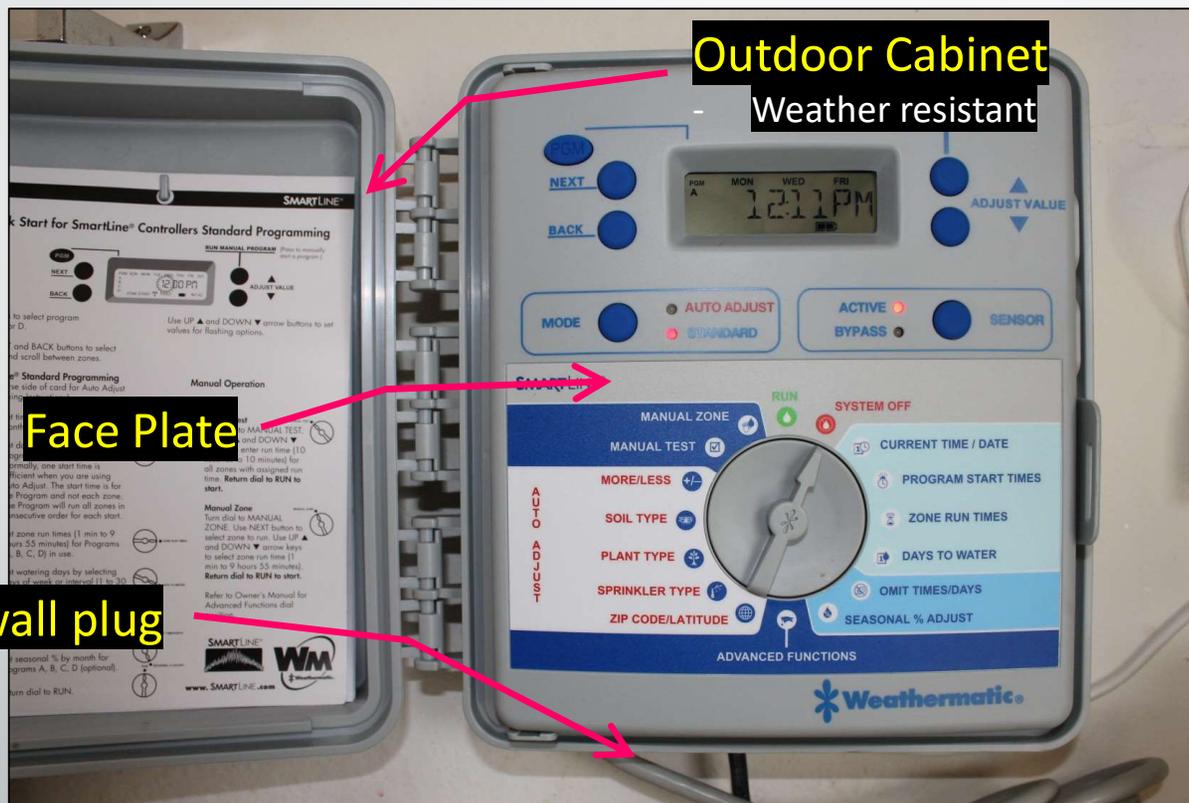
- Pro-C



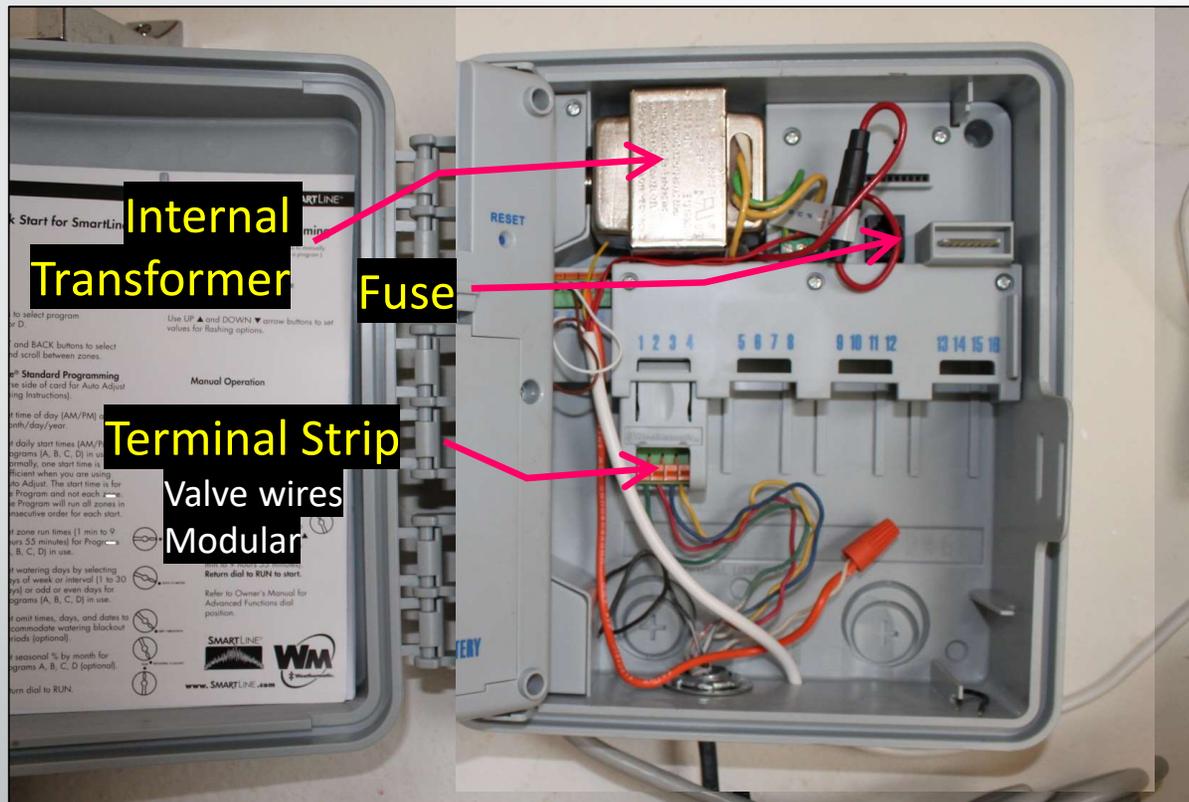
- X-Core



# Parts of an Outdoor Controller

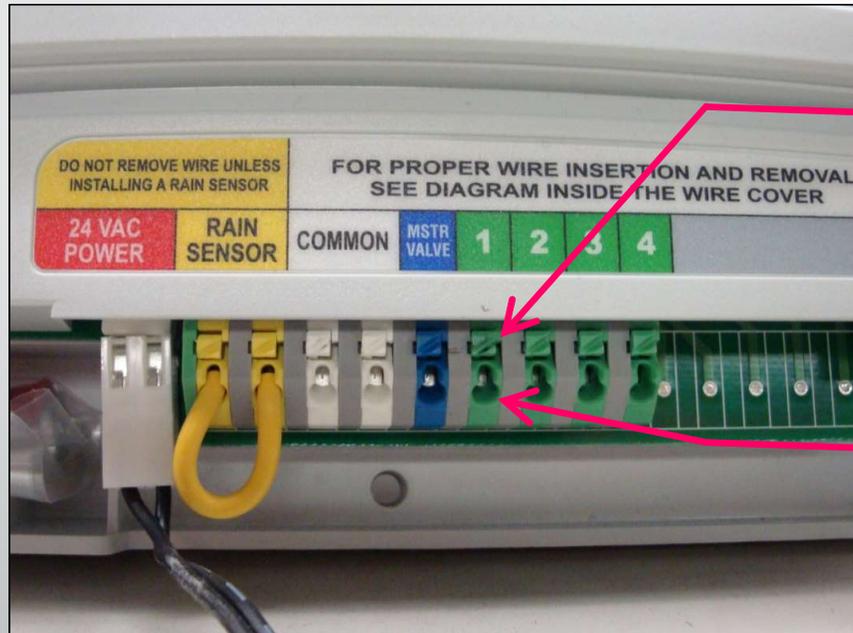


# Parts of an Outdoor Controller



# Parts of a Controller

## Clip type terminals

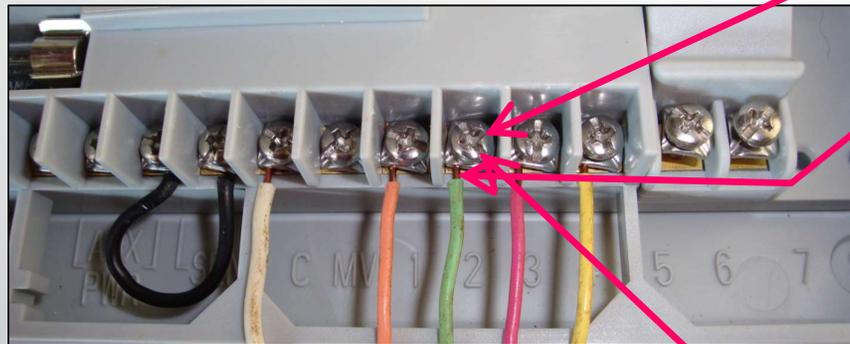


Push and hold in the tab above the terminal with a small screwdriver

Push the bare end of the wire into the terminal and release the tab

# Parts of a Controller

Screw type terminals



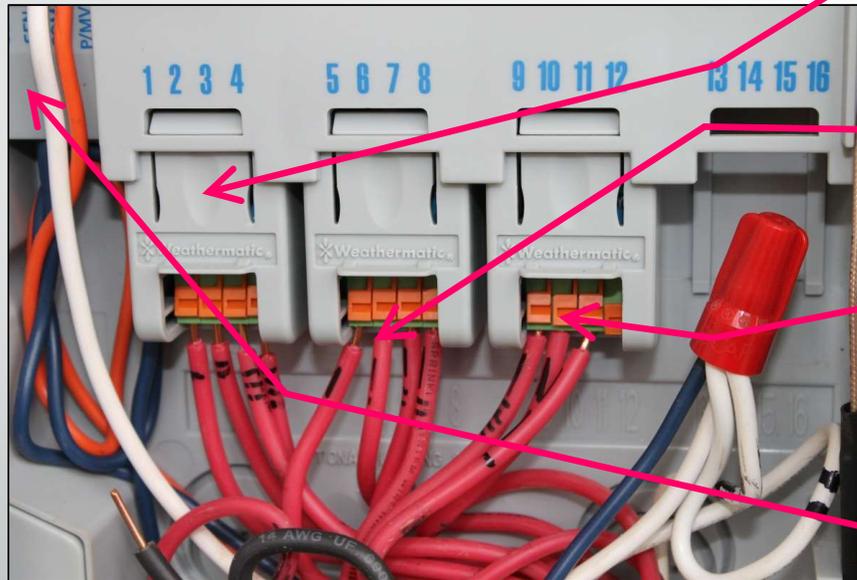
Unscrew the terminal screw

Insert the bare end of the wire under the terminal screw head

Tighten the terminal screw

# Parts of a Controller

## Modular type terminals



Modules snap in to expand the size of the controller  
Each module can hold 4 wires

Many brands have modules with the clip-type terminals

The common wires are connected to a separate terminal

# System Wiring

- There are two types of wiring for irrigation zones wires
  - Single conductor
  - Multi-conductor
- Wires come in different gauges.
  - The higher the gauge number, the smaller the wire.
  - Example: #14 gauge is larger than #18.

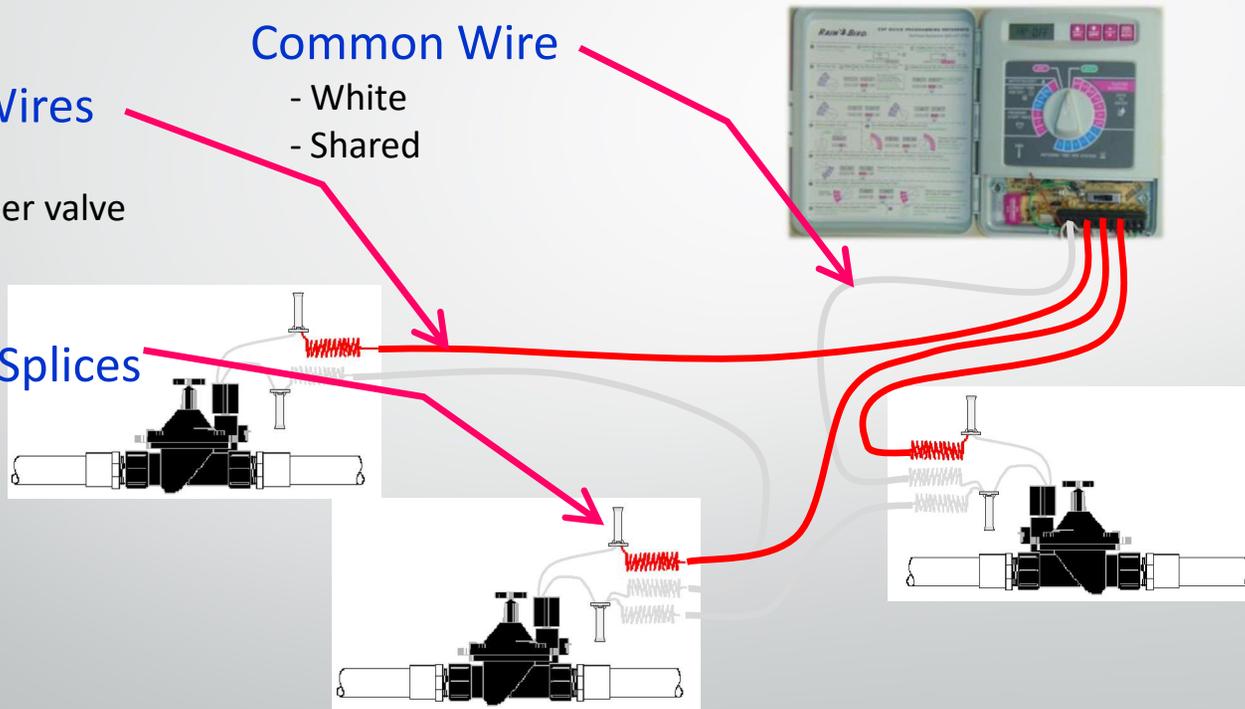
# System Wiring – Single Conductor

**Valve Wires**  
- Color  
- One per valve

**Common Wire**

- White
- Shared

**Waterproof Splices**



# System Wiring – Multi Conductor

## Common Wire

- White
- Shared

## Waterproof Splices



## Valve Wires

- Color
- One per valve

