

### The Australian Cockroach, *Periplaneta australasiae*

#### APPEARANCE

The Australian roach ([Figure 1](#)) is about 1 1/4 to 1 3/8 inches long and the wings of both sexes cover the abdomen. It resembles the American roach ([Figure 2](#)), which is about 1 3/8<sup>th</sup> to 2 1/8<sup>th</sup> inches and can be distinguished from the American roach by its slightly smaller size. The head of the Australian roach is a prominent identification key. The pronotum (which is the covering over the body segment between the head and abdomen) has a yellow background with a black bat-winged mark in the center. There are also light yellow streaks originating at the base of the wings and running longitudinally down the upper edges of the wings. Many technicians characterize these wing markings as a lieutenant's bars. The female Australian has a broader abdomen than the male. The newly hatched nymphs (instars) are near black, about 1/16 inch in length with a white horizontal band. Older nymphs possess distinct bright yellow spots along the margins of their abdomen.



Figure 1. Australian Roach first instar and adult



Figure 2. American Roach adult

#### HABITAT

The Australian roach is an outdoor roach that likes to live in areas with prevalent organic matter such as leaf litter, mulch or potting soils. Look for this roach in mulch beds, at or near the base of trees, shrubs or palms. You may also see this roach in or near stacks of stored firewood.

If an Australian roach finds its way inside the home through a crack or crevice, it can be found randomly foraging through the house looking for food, moisture or a suitable home such as a potted plant. It has the capacity to be a pest by eating holes in clothing and feeding upon book covers.

## BIOLOGY AND HABITS

The Australian roach life cycle is about one year from egg to adult. Adult females will produce 20 to 30 egg capsules during their five to six month lifespan. Each egg capsule will contain between 24 to 28 eggs of which approximately 16 will hatch. The egg capsule is typically deposited into hidden areas such as cracks or crevices shortly after it is formed. A common egg depository is the area between the trunk and base of palm fronds.

## OUTDOOR CONTROL PROCEDURES

When specifically treating for Australian roaches, you should seek out the likely harborage sites around the home or building you are protecting. Pull back mulch or leaf litter to find the sources of roaches. In cases where the source of infestation can be found you should provide direct treatment with a contact insecticide. In addition to contact treatment you should apply gel formulations of roach baits into or onto obvious breeding or harborage cracks or crevices. The trunks of palm trees are a likely spot. A perimeter application of insecticide granules or liquid residual may also be appropriate in cases of high infestation to act as a barrier to prevent or slow down indoor roach entry. Application of Advion Insect Granule or In Tice 10 Perimeter at the bases of infested trees may also help control these roaches if there has been no residual treatment in that area.

## INDOOR CONTROL PROCEDURES

When Australian roaches have been seen inside the home they most likely entered under door thresholds or were brought into the home with infested materials such as potted plants. When seen indoors they are usually full-grown adults. A breeding situation would give rise to all stages in monitor traps. Also, there would be droppings (looking like coffee grounds) in many of the cabinets or counters.

Search for likely sources of infestation such as potted plants and seek out avenues for entry such as loose door thresholds or poorly sealed windows. In homes with a fireplace look in the woodbin or where kindling materials such as old newspapers are stacked. In the case of random roaches that have found their way inside, a vacuum cleaner may be used to remove the infestation. The key to long-term control is to seal up access points and work on the breeding population outside. A very rare occurrence would be an attic infestation due to a roof leak. Should a roof leak be expected, try and gain access to the area in the attic below the leak to treat directly with residual materials. Then make sure that the leak is sealed or will be attended to. Always place and date monitor traps where roaches have been seen.

### CUSTOMER COMMUNICATION

Document all findings on your service report. Explain that the Australian roach is one of the most common roaches in Florida and that many people call it the “Palmetto bug”.

Indicate areas of structural concern that need to be addressed by the customer. A simple item such as caulking or sealing minor avenues is our responsibility. Cleaning up all the gutters surrounding the entire home that are full of leaf litter would be the customer’s responsibility. Indicate what to expect as a result of your service and whether a follow-up inspection will be necessary. When necessary, follow up in 7-10 days to ensure there is no breeding indoors. Have the customer sign this report indicating their understanding and thank them for their business.

Name: \_\_\_\_\_

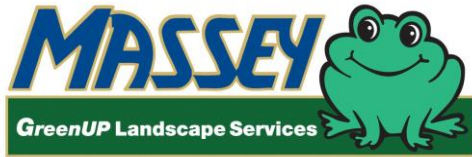
Date: \_\_\_\_\_

## PRE AND POST TEST QUESTIONS FOR AUSTRALIAN ROACHES

- 1) The Australian roach looks most similar to the \_\_\_\_\_ roach.
- 2) Describe the Australian roach hatchling:  
\_\_\_\_\_  
\_\_\_\_\_
- 3) An adult Australian roach would typically be located by: (Circle all that apply)
  - a) Looking through boxes in a garage.
  - b) Looking inside cabinets in the kitchen near where large “palmetto bugs” had been seen recently.
  - c) Looking into woodpiles, tree holes and behind dead palm fronds you pull off of a palm tree.
  - d) Opening and searching through the trunk of your customer’s car that they park outside all the time.
- 4) What treatment method would you utilize for an indoor population of Australian roaches? Describe in detail:  
\_\_\_\_\_  
\_\_\_\_\_
- 5) The cycle from egg to adult for an Australian roach is about \_\_\_\_\_
- 6) The adult Australian roach can be described by its size of about \_\_\_\_\_ to \_\_\_\_\_ inches long.
- 7) What is a prominent identifying characteristic for this roach? \_\_\_\_\_

## ANSWERS TO PRE AND POST TEST QUESTIONS FOR AUSTRALIAN ROACHES

- 1) The Australian roach looks most similar to the American roach.
- 2) Describe the Australian roach hatchling:  
Near black, about 1/16<sup>th</sup> inch in length with a white horizontal band.
- 3) An adult Australian roach would typically be located by: (Circle all that apply)
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  - d) Opening and searching through the trunk of your customer’s car that they park outside all the time.
- 4) What treatment method would you utilize for an indoor population of Australian roaches? Describe in detail: Seek out avenues for entry and seal with appropriate exclusion material. Vacuum to remove infestation and/or bait using gel baits.
- 5) The cycle from egg to adult for an Australian roach is about one year.
- 6) The adult Australian roach can be described by its size of about 1 1/4<sup>th</sup> to 1 3/8<sup>th</sup> inches long.
- 7) What is a prominent identifying characteristic for this roach? The pronotum has a yellow background with a black bat-winged marking. The wings have light yellow “lieutenant’s” bars.



## WEEKLY TRAINING SESSION



### The Benefits of Core Aeration

**Topic Category:** Lawn

**Recordable Verifiable Training Hours:** 0.5

**Objectives:** This lesson is designed to teach the benefits of Core Aeration

**Length of lesson:** Approx 30 minutes.

**Materials needed:**

- Training Guideline
- The Benefits of Core Aeration Training Document found in the G: \Shared\GreenUp Reference Materials\GreenUp Protocols\Individual Protocols\Renovation
- Show how the aerator works somewhere at your location by aerating a section of turf.
- Pre- and Post- tests.

**Training Guidelines:**

- Make copies of the tests and training materials for all Team Members attending.
- Set up the training area in an area of the office that will minimize disruptions.
- 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 Use the Training outline as a guide for key points.
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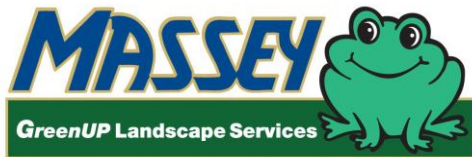


### The Benefits of Core Aeration

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

#### PRE & POST TEST

1. T or F Core aeration is a service that is offered by most other lawn care companies in the areas we service.
2. T or F A healthy soil contains 50% pore space, which contains 10% air and 40% water.
3. T or F Only turf grown in soils with substantial clay content need aeration.
4. T or F Roots need oxygen to survive.
5. T or F Aeration reduces nutrient and water runoff.
6. T or F Plants need aerobic micro-organisms to convert fertilizer into usable plant nutrients.
7. T or F Aerobic bacteria release nitrogen.
8. T or F Aerobic bacteria help decompose the dead material found in thatch.
9. T or F Roots of muck grown turf placed on a sand soil will tend to stay in the muck and do not want to root into the sand.
10. T or F Granular sulfur is applied if the soil pH is high.



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### The Benefits of Core Aeration

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## Benefits of Core Aeration

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Core aeration is a great benefit to our customers. It is a valuable service we offer that sets us apart from other companies who either don't offer the service or charge extra for it.

Core aeration is a mechanical means of extracting 3 inch long by 3/4" wide cores of soil throughout the lawn about 3 inches apart. These cores are left on the surface of the soil and break down within a few days to a week through rain and irrigation.

A healthy soil contains 50% pore space, which contains 25% air and 25% water. In a soil environment where turf is grown, the pore space is constantly reduced through rain, irrigation and traffic. There is good reason why farmers till the soil before replanting crops. Have you ever noticed the root system of a turf stolon (runner) when it has grown from the turf area and into a shrub bed? The root system in the turf area is typically 3 to 4 inches. At the point where the roots have grown into the edge of the shrub bed, the roots become much longer and contain many fine feeder roots. This is because a blade edger is often used to keep the shrub bed defined and typically done every few weeks. The edger blade cuts into and stirs up or "aerates" the soil. We cannot (and don't want to) till up our lawns on a frequent basis, but core aeration provides the benefits of tilling the soil without the disruption to the turf.

Core aeration is beneficial in all the turf areas, but there are certain situations where there is even more benefit than usual. Some areas we service have more clay content. Particularly are areas of South West Orange County, Clermont, The Villages, Tallahassee and Georgia. It is very difficult to grow turf in these clay soils without aeration. Additionally, Zoysia and Centipede grasses respond to core aeration particularly well. Green up to the turf is often noticed even without nitrogen fertilization.

Below is a list of benefits derived from core aeration that cannot be replaced by any other means.

Core aeration:

- Opens the soil to allow for better availability of oxygen and water to the root system.
  - Roots need oxygen to survive and flourish.
  - Water runoff is reduced because it can readily move into the soil profile.
- Nutrient runoff is reduced.
  - This is not only a benefit to the turf but is also a benefit to our environment.
- Stimulates the development of beneficial micro-organisms, which need oxygen to survive.



## GREENUP SERVICE PROTOCOLS

### Benefits of Core Aeration

- Aerobic (oxygen thriving) micro-organisms are essential to convert fertilizer into usable plant nutrients.
  - Aerobic bacteria release nitrogen.
  - These micro-organisms help to decompose the dead organic matter in thatch.
- Core aeration breaks up and helps to mix defined layers of different soil textures.
  - It is very common to have different layers of soil with different textures such as in the case of muck grown sod laid on the existing sand soil. Root systems will prefer to stay in the muck layer and avoid the sand. Core aeration will help mix those two layers. The micro-organisms, which are stimulated by the additional oxygen from the core aeration will speed up the decomposition of the muck.

In addition to the annual core aeration our customers receive, potassium or granular sulfur is applied in Florida. High efficiency lime is applied in Georgia. Proper soil pH is crucial for proper utilization of soil nutrients. The additional potassium done at the time of aeration benefits root growth and enhances the hardiness and vigor of the turf.

With all the benefits of core aeration, it is easy to see why this service helps to differentiate Massey from the other lawn care companies.

A customer information brochure titled, "Core Aeration Gets to the Root of Your Lawn's Needs" is available as a sales and service leave behind.

## Hydrophobic Soil

Hydrophobic soils are those that repel water rather than absorbing it. The condition of hydrophobic soil is detrimental to landscape plants including turfgrass. Identifying the condition is important and easy.

Water, the universal solvent, is repelled by a class of naturally occurring organic compounds called lipids. Lipids are insoluble in water. Lipids include natural oils, waxes, and steroids.

As organic matter decomposes, some lipids remain and accumulate naturally around soil particles and result in water being pushed away from the particle, causing hydrophobic soil. Dry soil that does not re-wet easily can be considered hydrophobic. Rain and irrigation water may not solve this problem.

**Hydro-phobic** means water-fearing. Hydrophobic substances are repelled by water and water is repelled by them.

**Hydro-philic** means water-loving. Hydrophilic substances mix readily in water but are repelled by hydrophobic substances.

Living creatures and our environment contain both hydrophobic and hydrophilic materials. It is not uncommon for sandy soils to become coated with organic molecules that are hydrophobic and repel water causing a less than desirable growing condition.

Hydrophobic soils can be remedied by good cultural practices including the proper use of irrigation and use of an irrigation surfactant. **Quickin™** is such an irrigation surfactant. Surfactants are molecules that contain both hydrophobic and hydrophilic components, allowing penetration of water into hydrophobic soil.

Use 2 ounces **Quickin™** surfactant per 1000 square feet followed by irrigation is the way to manage hydrophobic soil. Follow-up applications should be using a rate of 1 ounce per 1000 square feet. Read and follow the label.

Proper moisture will need to be maintained by managing the irrigation system. If the soil is drying too much, it is harder to re-wet. Conversely, if the soil moisture is maintained near field capacity, it is less likely to revert to a hydrophobic condition because the irrigation water is attracted to water already in the soil. This is the concept of cohesion, which is water molecules being attracted to other water molecules.

Communication to customers is crucial. Management of hydrophobic soils with the proper surfactant and the use of follow-ups will remedy the problem.

## Managing Hydrophobic Soil

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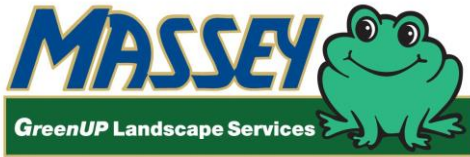
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Picture of a water droplet on hydrophobic soil.



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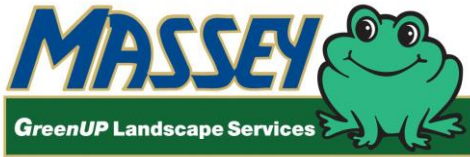


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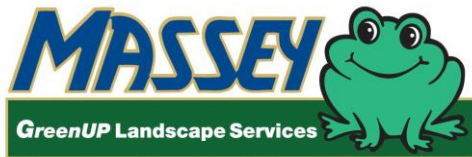
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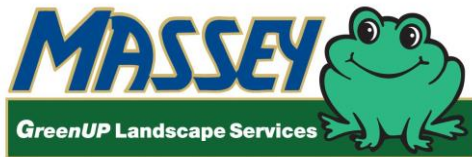


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## WEEKLY TRAINING SESSION



### The Benefits of Core Aeration

#### PRE & POST TEST ANSWER KEY

1. T or ☒ F Core aeration is a service that is offered by most other lawn care companies in the areas we service.
2. T or ☒ F A healthy soil contains 50% pore space, which contains 10% air and 40% water.
3. T or ☒ F Only turf grown in soils with substantial clay content need aeration.
4. ☒ T or F Roots need oxygen to survive.
5. ☒ T or F Aeration reduces nutrient and water runoff.
6. ☒ T or F Plants need aerobic micro-organisms to convert fertilizer into usable plant nutrients.
7. ☒ T or F Aerobic bacteria release nitrogen.
8. ☒ T or F Aerobic bacteria help decompose the dead material found in thatch.
9. ☒ T or F Roots of muck grown turf placed on a sand soil will tend to stay in the muck and do not want to root into the sand.
10. ☒ T or F Granular sulfur is applied if the soil pH is high.



## Benefits of Core Aeration

### Benefits of Core Aeration

Core aeration is a great benefit to our customers. It is a valuable service we offer that sets us apart from other companies who either don't offer the service or charge extra for it.

Core aeration is a mechanical means of extracting 3 inch long by 3/4" wide cores of soil throughout the lawn about 3 inches apart. These cores are left on the surface of the soil and break down within a few days to a week through rain and irrigation.

A healthy soil contains 50% pore space, which is contains 25% air and 25% water. In a soil environment where turf is grown, the pore space is constantly reduced through rain, irrigation and traffic. There is good reason why farmers till the soil before replanting crops. Have you ever noticed the root system of a turf stolon (runner) when it has grown from the turf area and into a shrub bed? The root system in the turf area is typically 3 to 4 inches. At the point where the roots have grown into the edge of the shrub bed, the roots become much longer and contain many fine feeder roots. This is because a blade edger is often used to keep the shrub bed defined and typically done every few weeks. The edger blade cuts into and stirs up or "aerates" the soil. We cannot (and don't want to) till up our lawns on a frequent basis, but core aeration provides the benefits of tilling the soil without the disruption to the turf.

Core aeration is beneficial in all the turf areas, but there are certain situations where there is even more benefit than usual. Some areas we service have more clay content. Particularly are areas of South West Orange County, Clermont, The Villages, Tallahassee and Georgia. It is very difficult to grow turf in these clay soils without aeration. Additionally, Zoysia and Centipede grasses respond to core aeration particularly well. Green up to the turf is often noticed even without nitrogen fertilization.

Below is a list of benefits derived from core aeration that cannot be replaced by any other means.

Core aeration:

- Opens the soil to allow for better availability of oxygen and water to the root system.
  - Roots need oxygen to survive and flourish.
  - Water runoff is reduced because it can readily move into the soil profile.
- Nutrient runoff is reduced.
  - This is not only a benefit to the turf but is also a benefit to our environment.
- Stimulates the development of beneficial micro-organisms, which need oxygen to survive.



## GREENUP SERVICE PROTOCOLS

### Benefits of Core Aeration

- Aerobic (oxygen thriving) micro-organisms are essential to convert fertilizer into usable plant nutrients.
  - Aerobic bacteria release nitrogen.
  - These micro-organisms help to decompose the dead organic matter in thatch.
- Core aeration breaks up and helps to mix defined layers of different soil textures.
  - It is very common to have different layers of soil with different textures such as in the case of muck grown sod laid on the existing sand soil. Root systems will prefer to stay in the muck layer and avoid the sand. Core aeration will help mix those two layers. The micro-organisms, which are stimulated by the additional oxygen from the core aeration will speed up the decomposition of the muck.

In addition to the annual core aeration our customers receive, potassium or granular sulfur is applied in Florida. High efficiency lime is applied in Georgia. Proper soil pH is crucial for proper utilization of soil nutrients. The additional potassium done at the time of aeration benefits root grown and enhances the hardiness and vigor of the turf.

With all the benefits of core aeration, it is easy to see why this service helps to differentiate Massey from the other lawn care companies.

A customer information brochure titled, "Core Aeration Gets to the Root of Your Lawn's Needs" is available as a sales and service leave behind.





## Green Up Technical Bulletin

### Hydrophobic Soil

Hydrophobic soils are those that repel water rather than absorbing it. The condition of hydrophobic soil is detrimental to landscape plants including turfgrass. Identifying the condition is important and easy.

Water, the universal solvent, is repelled by a class of naturally occurring organic compounds called lipids. Lipids are insoluble in water. Lipids include natural oils, waxes, and steroids.

As organic matter decomposes, some lipids remain and accumulate naturally around soil particles and result in water being pushed away from the particle, causing hydrophobic soil. Dry soil that does not re-wet easily can be considered hydrophobic. Rain and irrigation water may not solve this problem.

**Hydro-phobic** means water-fearing. Hydrophobic substances are repelled by water and water is repelled by them.

**Hydro-philic** means water-loving. Hydrophilic substances mix readily in water but are repelled by hydrophobic substances.

Living creatures and our environment contain both hydrophobic and hydrophilic materials. It is not uncommon for sandy soils to become coated with organic molecules that are hydrophobic and repel water causing a less than desirable growing condition.

Hydrophobic soils can be remedied by good cultural practices including the proper use of irrigation and use of an irrigation surfactant. **Quickin™** is such an irrigation surfactant. Surfactants are molecules that contain both hydrophobic and hydrophilic components, allowing penetration of water into hydrophobic soil.

Use 2 ounces **Quickin™** surfactant per 1000 square feet followed by irrigation is the way to manage hydrophobic soil. Follow-up applications should be using a rate of 1 ounce per 1000 square feet. Read and follow the label.

Proper moisture will need to be maintained by managing the irrigation system. If the soil is drying too much, it is harder to re-wet. Conversely, if the soil moisture is maintained near field capacity, it is less likely to revert to a hydrophobic condition because the irrigation water is attracted to water already in the soil. This is the concept of cohesion, which is water molecules being attracted to other water molecules.

Communication to customers is crucial. Management of hydrophobic soils with the proper surfactant and the use of follow-ups will remedy the problem.



## GREENUP SERVICE PROTOCOLS

### Managing Hydrophobic Soil

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Hydrophobic soils can be remedied by good cultural practices including the proper use of irrigation and use of an irrigation surfactant. **Quickin™** is such an irrigation surfactant. Surfactants and wetting agents are not all the same. **Quickin™** is formulated for more efficient mitigation of hydrophobic soil.

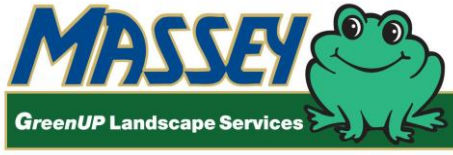
Use 2 ounces **Quickin™** surfactant per 1000 square feet followed immediately by irrigation is the way to manage hydrophobic soil. Follow-up applications should be using a rate of 1 ounce per 1000 square feet, again followed immediately with irrigation. Read and follow the label.

Proper moisture will need to be maintained by managing the irrigation system. If the soil is drying too much, it is harder to re-wet. Conversely, if the soil moisture is maintained near field capacity, it is less likely to revert to a hydrophobic condition because the irrigation water is attracted to water already in the soil. This is the concept of cohesion, which is water molecules being attracted to other water molecules.

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Picture of a water droplet on hydrophobic soil.



## **WEEKLY TRAINING SESSION**



### **Trouble Shooting Part 1 Meter System**

#### **What to do when you have one zone with low pressure?**

- First of all make sure that it is only one zone with low pressure.
- Check the water meter when it is NOT running. It should be still.
- Turn on the zone in question.
- Look for leaks at or around each head.
- If the heads are covered, pull the grass away to view the head.
- Keep in mind that a leaking head can be as much as 4GPM.
- On the zone in question, calculate the total gpm based on what type of nozzles are in place.
- Then, while that zone is running, use the stop watch on your phone to time the usage from the water meter.
- Hit the start button when the meter needle is at "0" or the readout, on a digital, is at ".00".
- Time it for 1 minute. This is possible because the zone has been running and all of the air has been pushed out of the lines. The reading will be true.
- Compare the results to the results of the nozzle type total.
- If the result is higher than the nozzle type total, you have a leak.

#### **How do I locate a leak I can't see?**

- If the zone is sprays or MPR's, the process is not too difficult.
- Change all nozzles to the 15' adjustable spray nozzles. These will turn off almost completely.
- Turn on the zone and begin to turn off each nozzle.
- As you do this, it will push the water to whatever leak may be present.
- Check the water meter to see the gpm for the leak.
- Remember that not all leaks are seen.
- You will need to walk the areas between the heads and possibly listen for a leak.
- For a rotor zone you will need to dig up and cap each rotor. "Threaded cap".
- Turn on the zone and repeat the above steps.