

Lesson C3–4

Selecting and Establishing Turfgrass

Unit C. Nursery, Landscaping, and Gardening

Problem Area 3. Landscape Installation

Lesson 4. Selecting and Establishing Turfgrass

New Mexico Content Standard:

Pathway Strand: Plant Systems

Standard: III: Apply fundamentals of production and harvesting to produce plants.

Benchmark: III-A: Apply fundamentals of plant management to develop a production plan.

Performance Standard: 1. Identify and select seeds and plants. 2. Manipulate and evaluate environmental conditions (e.g., irrigation, mulch, shading) to foster plant germination, growth and development. 3. Evaluate and demonstrate planting practices (e.g., population rate, germination/seed vigor, inoculation, seed and plant treatments). 4. Evaluate and demonstrate transplanting practices. 5. Prepare soil/media for planting.

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. Explain how to select the proper turfgrass.
2. Describe how to properly prepare the planting site.
3. Describe how to seed the planting site.
4. Discuss how to properly install sod.
5. Explain the proper installation of plugs.

List of Resources. The following resources may be useful in teaching this lesson:

Recommended Resources. One of the following resources should be selected to accompany the lesson:

Biondo, Ronald J. and Charles B. Schroeder. *Introduction to Landscaping: Design, Construction, and Maintenance*, Second Edition. Danville, Illinois: Interstate Publishers, Inc., 2003.

Schroeder, Charles B., et al. *Introduction to Horticulture*, Third Edition. Danville, Illinois: Interstate Publishers, Inc., 2000.

Ingels, Jack E. *Landscaping: Principles and Practices*, Fifth Edition. Albany, New York: Delmar Publishers, 1997.

Other Resources. The following resources will be useful to students and teachers:

Reiley, H. Edward and Carroll L. Shry, Jr. *Introductory Horticulture*, Sixth Edition. Albany, New York: Delmar Publishers, 2002.

List of Equipment, Tools, Supplies, and Facilities

Writing surface
Overhead projector
Transparencies from attached masters
Copy of student lab sheet

Terms. The following terms are presented in this lesson (shown in bold italics):

Cool season turfgrass
Plugging
Seeding
Sodding
Turf
Turfgrass
Turfgrass blend
Turfgrass mixture
Warm season turfgrass

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here:

Divide students into small groups and ask them to generate a list of adjectives to describe a sweeping lawn (like that of a golf course fairway). Chances are their lists will use many favorable terms. In scientific surveys where people were shown photos of different habitats, 85 percent of the people tested worldwide—

regardless of what ecosystem they were living in or what country—chose open savanna as the most appealing. There is strong biological evidence, probably based on our evolutionary roots, supporting a lawn's appeal.

Summary of Content and Teaching Strategies

Objective 1: Explain how to select the proper turfgrass.

Anticipated Problem: What is the best turfgrass to use?

- I. **Turf** is the top layer of soil with the plants that it supports. Most Americans who use the term turf are referring to turfgrass, but turf can actually be a groundcover such as ivy or other plants such as chamomile, creeping thyme, or creeping yarrow. **Turfgrass** is specifically the collection of grass species grown to form a groundcover. Turfgrass adds appeal to nearly every landscape. Turf can create a visual floor or carpet for outdoor rooms, residential settings, and panoramic vistas. Additionally, lawn areas act as a transition between physical structures and their surrounding beds. Most turf is highly wear resistant in comparison to other plants, making it a good choice for heavily trafficked areas.
 - A. Proper selection of turfgrass is necessary if the grass is to achieve its desired use, whether it's for a golf course, playing field, park, or suburban lawn. The grass on a playing field will have different stresses than a suburban lawn or a golf course putting green. Lawns with high traffic should use tougher strains of grass than areas which are used more for visual interest which call for a finer textured grass.
 - B. Environmental considerations play a large part in selecting a turfgrass. Temperature and precipitation are key factors affecting the adaptability of a turfgrass to a site. Other factors include the type of soil, the use of the area to be established, and the grasses' maintenance requirements.
 1. **Cool season turfgrass** grows best in temperatures of 60–75°F. They may become dormant if allowed to dry out during the summer. **Warm-season turfgrass** grows best in temperatures of 80–95°F.
 2. There are four main turfgrass climatic zones:
 - a. Cool humid—best suited to cool season grasses such as bluegrass, ryegrass, fescue or bentgrass. The soils are generally acidic and some irrigation may be needed to supplement the natural rainfall of the area.
 - b. Warm humid—best suited to warm season grasses such as Bermuda grass, zoysia, or St. Augustine grass. The soils are generally strongly acidic and may be infertile due to low organic content.
 - c. Cool arid/semi-arid—best suited to buffalo grass and wheat grasses. The soils are generally acidic and will usually not support other grasses unless there is adequate fertilization and irrigation.

- d. Warm arid/semi-arid—best suited to warm season grasses like grama grasses. The soils are usually alkaline with low fertility. They will not support grass without irrigation.
3. The amount of sun or shade a lawn receives will also affect grass selection.

Use TM: C3–4A to review with students the Turfgrass Regions. Have them identify their own region on the map. Discuss transition zones. Show students TM: C3–4B and TM: C3–4C. Ask students to bring in a sample of turfgrass from their own lawn at home. Help them to identify what species or cultivars of grass they are growing.

Objective 2: Describe how to properly prepare the planing site.

Anticipated Problem: How can the site be properly prepared?

- II. In order to establish turf, regardless of the means of installation, proper preparation of the planting site will reduce many problems. Drainage, aeration, soil compaction, pH, soil fertility, and debris may need to be addressed.
 - A. Weeds, especially perennial grasses, must be removed before seeding a lawn or they will compete with more desirable grasses for the available nutrients and water. Use of an herbicide prior to other work will effectively remove these pests.
 - B. Proper drainage can be created by grading the site. Generally a 1 to 2% slope away from buildings is adequate. If the soil is clayey, soil amendment may be necessary to improve percolation of water. For very heavy clay soils, it may be necessary to install drainage tiles. During the grading process, debris such as rocks or wood should be removed.
 - C. Most turfgrass grows best with a pH of 6.0 to 7.0. A soil test should be done, if topsoil is being brought to the site. PH amendments such as lime or sulfur can be added if necessary. Soil fertility can also be addressed at this time by adding organic matter or fertilizer.

Have students observe a playing field on the school's property. Notice the grading that aids in proper drainage. Have someone in ground maintenance show students how the soil is aerated on a regular basis with the use of an aerifying machine, how it is fertilized, and how it is irrigated. You may also do soil tests to analyze the pH or fertility of the playing field versus areas of the school property that do not receive such regular upkeep.

Objective 3: Describe how to seed the planting site.

Anticipated Problem: How is seeding accomplished?

- III. **Seeding** a lawn, where grass seed is used to establish the turf, is usually done in cool-season areas. Advantages to seeding include using desired species or cultivars, having the plants develop in the environment in which they will be growing, having plants develop deep root systems, and reduced costs compared to other methods of turfgrass establishment. Seeding should be done in early spring or late summer (in the cool—humid region), when the weather is at it's optimum for good germination and growth.

- A. Once the site has been prepared, the proper grass needs to be selected. Turfgrass may be of one cultivar or it may be a blend. A **turfgrass blend** is a combination of different cultivars of the same species. Most blends contain several cultivars, all chosen for their uniform appearance and growing habit. A **turfgrass mixture** is a combination of different grass species.
- B. When planting the grass seed, it is important to follow the seed label's instructions for seeding rates. Seed should be chosen for freshness, high germination rate, and the lowest weed seed rate possible. Good turfgrass seed is more expensive but will save much time and money in the long run.
1. Once selected, the seed should be applied using a spreader. Divide the seed into two halves. Apply one half the seed going in one direction, then sow the other half at a right angle to the first course.
 2. After the seed is sown, germination can be improved by lightly raking the soil surface to insure good seed-to-soil contact, followed by rolling the lawn.
 3. Light mulching of the seed bed reduces drying out of the tender seedlings. Use clean straw or paper mulch scattered lightly over the surface. Mulching has the added benefit of reducing seed from blowing or getting washed away by rain. Grass seedlings will grow up and over the mulch as it decomposes.
 4. Adequate water is essential for establishing a seeded lawn. For the first few weeks, the seedlings should be watered lightly and frequently, sometimes more than once in a day. The goal is to create a consistently moist (yet not saturated) environment for the tender young plants. As the grass begins to mature, irrigation should become less frequent but more thorough, so that the soil is well hydrated to a depth of one inch.
 5. The first mowing should be done when the new grass has grown about ½ inch taller than its desired height (generally between 2½ to 3 inches). No more than one third of the grass blade should be removed at each mowing. For the first mowing, the cuttings may be collected. After that, mulching the grass cuttings back into the lawn contributes to the health of the turf.

There are many good texts dealing with grass seeding; these can be researched for a deeper understanding of the material. Use LS: C3–4A to study seedling growth and to get hands-on experience.

Objective 4: Describe how to properly install sod.

Anticipated Problem: How is sod installed?

- IV. **Sodding** is when the mature top layer of turf including the grass plant and a thin layer of soil is used to establish a lawn. It can create an 'instant' lawn for the homeowner. Sod is also selected for its erosion control and its post installation ease of upkeep. In warm-season regions, sod is the first choice of lawn installation since many warm-season grasses reproduce through vegetative propagation.
- A. Sod should be used as soon as possible after harvesting, ideally within 24 hours, otherwise rolled sod will heat up, damaging or destroying the live grass. Choose sod that con-

tains a mix of grass varieties that will grow well in your weather region. Additionally, take into account the conditions where it will be planted, choosing shade tolerant sod for under trees, drought tolerant sod for hillsides, etc. In cool season regions, sod is best laid in the early fall but it can be established at any time of the year provided the ground is not frozen.

- B. The soil bed should be moist before the sod is laid. Sprinkling the site the evening before—or the morning of—installation is effective.
- C. The soil should be prepared for sodding much as it would be for seeding. It should be graded, amended, and rolled to improve the sod's chances of good establishment. Once prepped, the sod is laid, starting at a straight edge. Sods should be butted together closely, but not overlapping. The strips must also be in good contact with the soil for the grass plants to survive. A running bond pattern is used to reduce gapping of the sod sheets.
- D. Once laid, the sods should be irrigated regularly until well established.

Show students TM: C3–4D. Ask students what the running bond pattern reminds them of. Discuss with them why this pattern is chosen for construction building as well as landscape sodding (to increase strength and reduce chances of shrinkage or furrows developing).

Objective 5: Explain the proper installation of plugs.

Anticipated Problem: How are plugs installed?

- V. **Plugging** is when small circular or square pieces of sod (between 2 to 4 inches in size) are inserted into an established turf or on a prepared seedbed. This method is particularly useful in the establishment of zoysia grass or other subtropical turfgrasses, since these plant species do not produce seed well.
 - A. Grass plugs are sold by the tray or pallet. Plugs are used to create a pattern of grass that will eventually grow over to fill the empty areas. It is usually a less expensive process than sodding with a comparable grass, however it is a time-consuming/labor intensive process.
 - B. Plugs are planted generally six to eight inches apart on the seedbed. After planting, the soil should be firmed around each plug and the area should be kept moist for a few weeks until the grass is established. The plugs will typically grow to cover the entire area within one season.

Review/Summary. Lawns make up an important part of a landscape since they visually tie buildings to other landscaped areas of the property. Most homeowners would agree that it is the single most important plant in their yard. Lawn areas create a surface for recreational activities. They can also prevent or reduce erosion.

Proper selection and installation of turfgrass is necessary if the lawn is to grow well and become established. Several factors, such as climate region, time of year, site use, and soil makeup need to be

taken in to consideration when choosing turfgrass as well as the method of installation. Seeding, sodding, and plugging are all viable options for establishing a lawn.

Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at the end of each chapter or in the ancillary materials of the recommended texts may also be useful in the review/summary.

Application. Application can involve the following student activities using the attached lab sheets.

LS: C3–4A—How Do Different Types of Grass Grow?—Observational Experience

Evaluation. Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is attached.

Answers to Sample Test:

Part One: Matching

1=c, 2=e, 3=a, 4=d, 5=b, 6=f

Part Two: Completion

1. Plugging
2. Sodding
3. Seeding

Part Three: Short Answer

1. Turf can be any low growing plant used as a groundcover (creeping thyme, chamomile, moss, yarrow, grass, etc.) Turfgrass is *specifically* grass which is used as a groundcover.
2. Factors include the future use of the lawn, the amount of sun or shade, and environmental factors such as temperature, precipitation, climate zone.
3. Benefits include lower costs, choosing one's desired cultivar or species of grass, growing plants in their future environment, and having the grass develop a strong root system.

Test

Lesson C3–4: Selecting and Establishing Turfgrass

Part One: Matching

Instructions. Match the term with the correct response. Write the letter of the term by the definition.

- | | | |
|--------------------------|--------------------|----------------------|
| a. cool season turfgrass | b. turfgrass blend | c. turf |
| d. warm season turfgrass | e. turfgrass | f. turfgrass mixture |

- _____ 1. The top layer of soil with the plants that it supports.
- _____ 2. Specifically the collection of grass species grown to form a groundcover.
- _____ 3. Turfgrass which grows best in temperatures of 60-75°F.
- _____ 4. Turfgrass which grows best in temperatures of 80-95°F.
- _____ 5. A combination of different cultivars of the same species of grass.
- _____ 6. A combination of different grass species.

Part Two: Completion

Instructions. Provide the word or words to complete the following statements.

1. _____ is when small circular or square pieces of sod (between two to four inches in size) are used to establish a lawn.
2. _____ is when the mature top layer of turf including the grass plant, its roots, and a thin layer of soil is used to establish a lawn.
3. _____ a lawn is when grass seed is used to establish the turf, and is usually done in cool-season areas.

Part Three: Short Answer

Instructions. Provide information to answer the following questions.

1. What is the difference between turf and turfgrass?

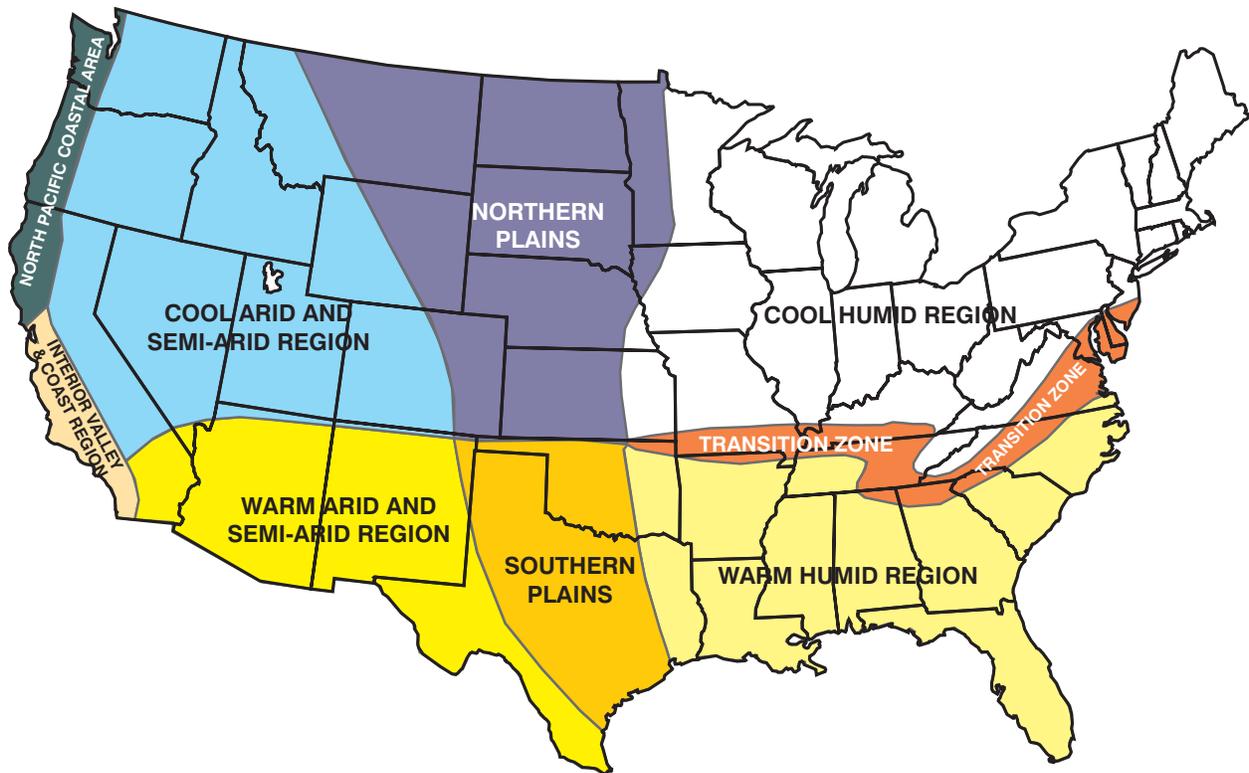
2. What are two of the environmental conditions that can affect the selection of a turfgrass?
 - a.

 - b.

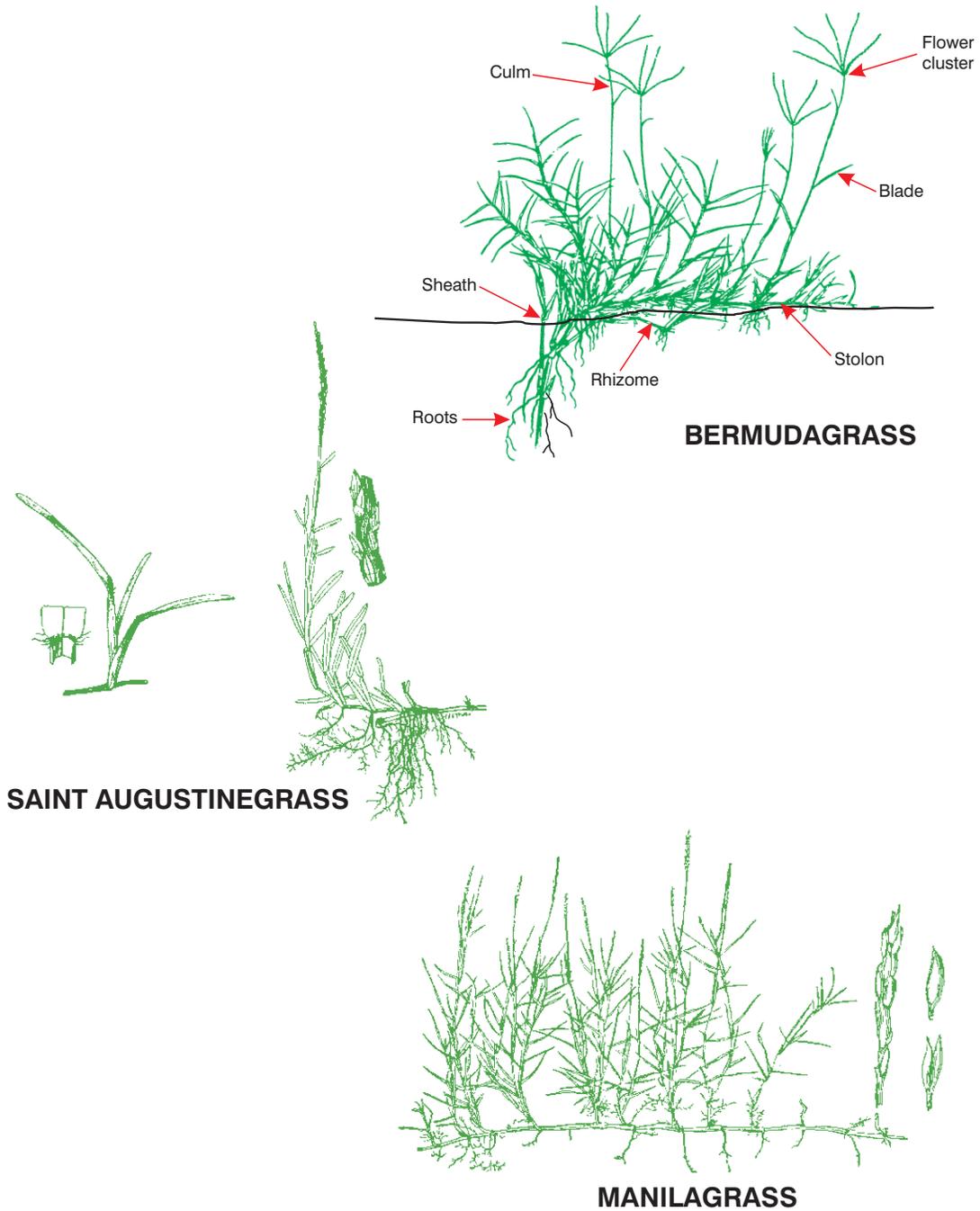
3. What two of the advantages of seeding for turfgrass installation?
 - a.

 - b.

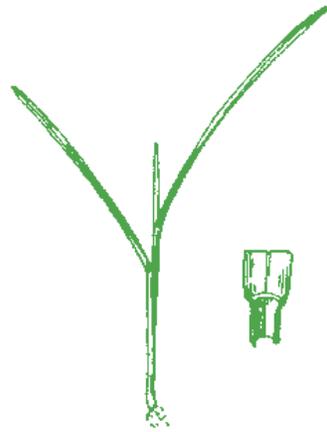
TURFGRASS CLIMATE REGIONS



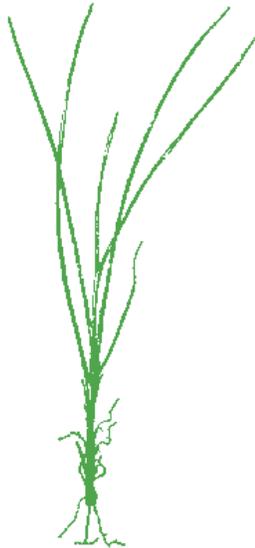
EXAMPLES OF WARM SEASON GRASSES



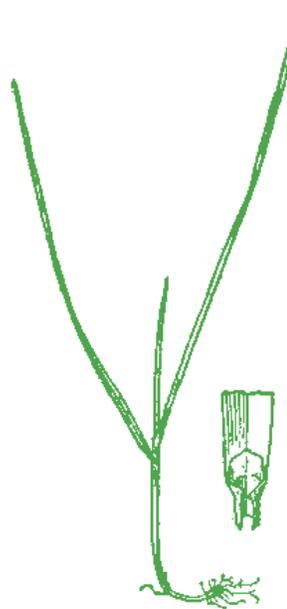
EXAMPLES OF COOL SEASON GRASSES



KENTUCKY BLUEGRASS



FINE FESCUE



PERENNIAL RYEGRASS

TM: C3-4D

TURF PROPERLY INSTALLED



Lab Sheet

How Do Different Types of Grass Grow?

Purpose:

To better understand the best processes for growing grass seed and to compare different seed blends or mixtures.

Materials:

grass seed—with at least two different mixtures or blends
growing media
plant misters
seed flats or pots
plastic wrap or plastic sheeting

Procedure:

1. Prepare the seedbed for planting. A good growing mix or other planting media should be used. If the media is too dry, it should be moistened so that it is consistently damp throughout. The soil should be spread about 1 to 1½ inches thick in the bottom of the seed flat or to within 2 inches of the top of the pot. Level the soil without compacting it.
2. Get grass seed from your instructor. Some students will have sample A while others will have sample B. Sow your seeds uniformly over the seedbed. Coverage should be good without being too dense (which would cause the seedlings to overcompete leading to weak plants).
3. Lightly rake or comb seeds into the soil to ensure good seed-to-soil contact. The grass seed should be mixed into the top 1/8 inch of soil. Then gently press or roll the soil to further ensure good seed-to-soil contact.
5. Water thoroughly using a plant mister.
6. Label your flat or pots with your name, the date, and your seed sample (A or B).
7. Place in a warm, sunny location. The grass seed should sprout within a few days of sowing.
8. The grass needs to be kept moist. It will need frequent misting/light watering. The flats or pots can be covered with plastic wrap or thin plastic sheeting to keep the humidity up.

