Integrated Pest Management:
Turfgrass Establishment & Renovation

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Steps to successful turfgrass establishment

1. Soil test
2. Weed control
3. Surface renovation
4. Liming and basic fertilizer
5. Seed bed preparation
6. Starter fertilizer
7. Seeding or sodding
8. Mulching

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Soil Test

- Composite soil sample
  - 10 cores per acre
- OSU Central Analytical Laboratory
  - https://cropandsoil.oregonstate.edu/cal
- Acidic pH (≤ 5.5)
  - Lime
- Macronutrient deficiencies
  - Primary: phosphorous and potassium
  - Secondary: calcium, magnesium and sulfur

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Weed Control

- New establishment
  - Non-selective herbicide
    - Glyphosate
- Renovating an existing stand
  - Selective broadleaf herbicide
    - 2,4-D, triclopyr, MCPP, dicamba

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Surface Renovation

- Dethatch
- Core aerate
- Fraze mowing
- Sod cutting
- Tilling




Surface Renovation

- Remove debris
  - Tree stumps or roots
  - Rocks and Stones
- Establish a slope
  - 1%



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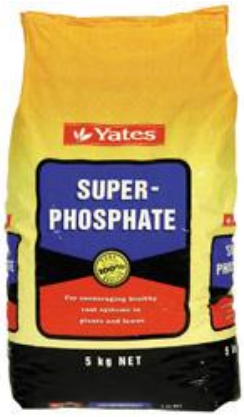
Liming and Basic Fertilizer

- Acidic pH (≤ 5.5)
  - Limestone: Calcite ($CaCO_3$)
  - Dolomite [$CaMg(CO_3)_2$]

Liming and Basic Fertilizer

- Primary nutrients
  - Phosphorus
    - Super-phosphate
  - Potassium
    - Potash



Liming and Basic Fertilizer

- Secondary nutrients
  - Calcium
    - Limestone
  - Magnesium
    - Dolomite
  - Sulfur
    - Elemental sulfur

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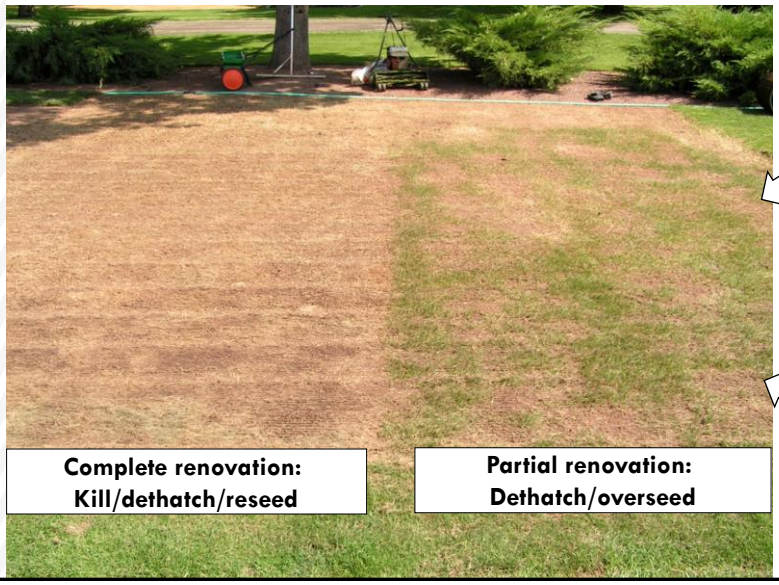
Seed bed preparation - tilled

Seed bed preparation – no till



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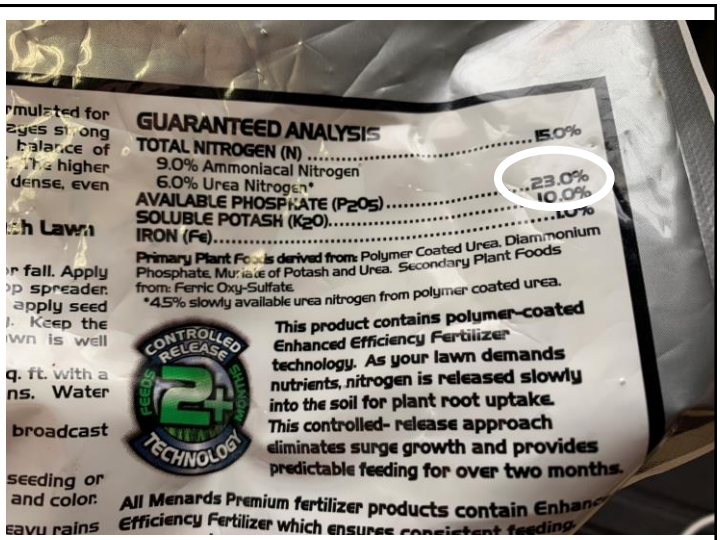
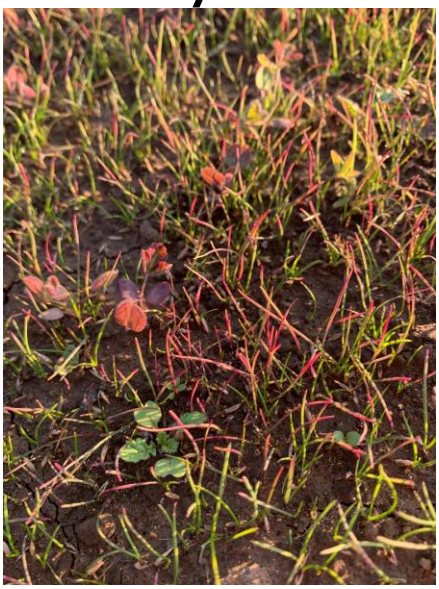
Starter Fertilizer

- Soil test to determine if nutrient deficiencies or unsuitable pH exist
- Apply starter fertilizer (e.g 12-25-10)
- <u>High in phosphorus</u>
- Moderate level of nitrogen; 0.5 to 1.0 lbs N
  - Higher rates can be used with slow release N
- Second application of 0.5 lbs N may be required 2-4 wks after seedlings emerge

Starter Fertilizer



Phosphorus Deficiency at Planting



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Selecting Suitable Species

Species	Seeding Rate (lbs/1000ft^2)	Eastern Oregon	Western Oregon	Notable Characteristics
Annual Ryegrass	5 - 10	✓	✓	Temporary stand, not a good lawn, overseeding
Perennial Ryegrass	5 - 7	✓	✓	Dark green, requires higher maintenance, fast germination
Tall Fescue	6 – 9	✓		Good drought/heat tolerance, traffic tolerant poor winter quality in western Oregon,
Fine Fescues	3 – 5		✓	Good shade tolerance, poor traffic tolerance, lower maintenance
Kentucky Bluegrass	2 – 4	✓		Dense, looks great under higher maintenance, good winter hardiness, slow germination
Bermudagrass (warm season)	2 – 3	✓		Heat and drought tolerance, traffic tolerant, early dormancy, slow greenup

General tips for buying grass seed

- Look for grass mixes with named cultivars, high germination percentages, and low weed content
- Avoid mixes containing annual ryegrass

Timing of Seeding

Cool-Season

Best established late spring or early fall

Spring/summer seedings require herbicide applications and more water

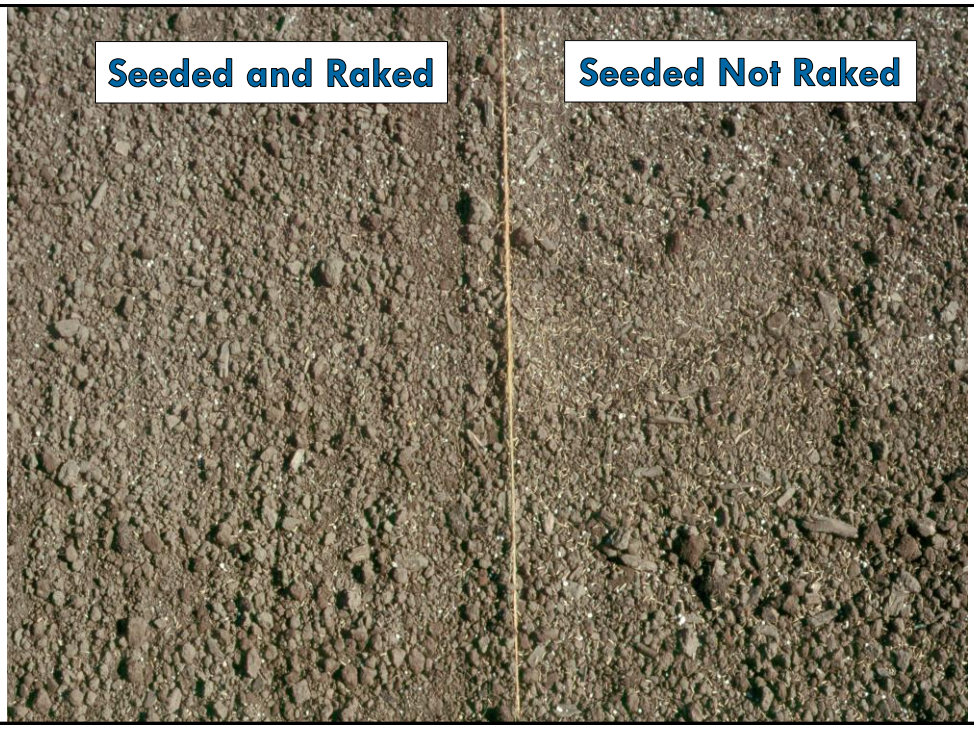
Summer seeding can get Pythium

Warm-Season

Best established late spring or early summer

Soil temps above 65°F

Seeding may require herbicide applications



Seeding summary

- Optimum times:
  - August 15-September 15 and May 1-June 15
  - Late fall plantings can be weedy and too soft to mow
  - Mid summer is a bad time
- Mulch:
  - Useful in cooler weather, not hot weather
- Seeding rates:
  - 5-10 lbs/1000ft^2, depending on species
  - Increase seeding rate for late fall plantings
  - Decrease seeding rate for hot weather plantings
- Fertilize:
  - Fertilize at planting with a starter fertilizer that contains phosphorus and ~1.0 lb N/1000ft^2
  - Fertilize again 2-4 weeks after planting with ~1.0 lb N/1000ft^2
- Irrigation:
  - Keep the soil moist, not water logged by irrigating 2-4 times per day
  - After the grass germinates, reduce number of daily irrigations
  - Once established, increase irrigation run time but change frequency to every other day (~0.25" 4x/wk)

Site prep for sod is identical to seeded lawns

Fit sod to get tight seal at the joints

Irrigate sod much like a newly seeded lawn

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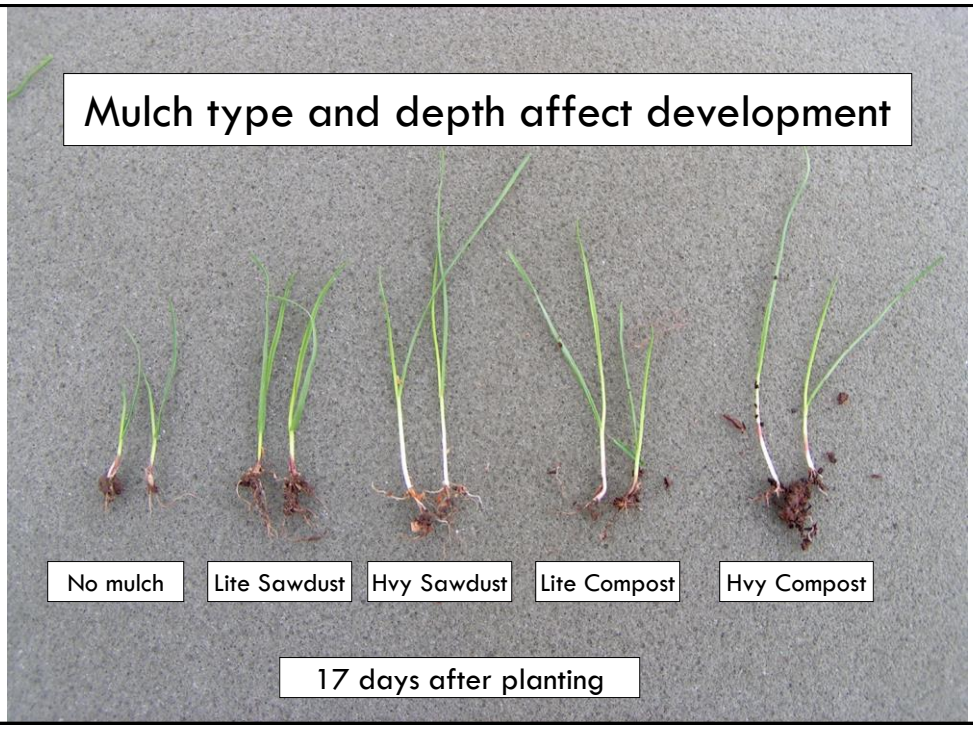
Mulching renovated sites improves uniformity

Mulches:

- Hold the seed in place
- Speed germination
- Improve stand uniformity



Reasons for unsuccessful seedling establishment

- **Planting depth** – too deep, the seedling runs out of energy
- **Age of Seed** – older than 5yrs, embryo may be dead
- **Disease** – damping-off or *Pythium*
- **Poor seed bed prep** – compaction issues, surface crusting
- **Dormancy** – arrested growth caused by lack of water, low temps, or high temps