

How to Have a Dynamite Lawn

by
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I. Analyze Your Lawn

A. Visual Analysis

Periodically inspect your lawn: Look at the density and color of the grass, presence of weeds including weed grasses, signs of soil compaction, turf disease or damage from crane fly larvae. This will help you determine what maintenance actions are called for. The decision is yours about maintenance for appearance because it is strictly subjective.

B. What's Below the Surface?

Remove sample soil cores from several areas. Examine the soil type, depth, any soil layers, depth of grass roots and moisture content. A good lawn needs a minimum of 6" of soil, preferable a sandy loam; 12" or more of soil depth will allow deep rooting and efficient water use. Grass roots should be white or light tan and at least 4" - 6" into the soil. What is the thatch depth? Up to ½" is desirable; more than that should be removed. Are there organic layers buried in the soil profile? Was a past lawn buried during excavation? These layers stop root and water penetration and should be broken up

C. The Soil Test

Get a soil test before any renovation. A soil test kit is available from county Cooperative Extension offices. In King County phone 296-DIAL and ask to hear tape #144, Soil Testing. The cost of a test will be recovered by learning which soil amendments are and are not needed for your lawn.

II. Lawn Maintenance

A. Mowing

1. **When to mow:** Whenever grass height is 1/3 higher than cutting height. Removing more than 1/3 of grass blade stresses grass. Example: mowing height is 2", mow when grass is 3" tall. Mowing interval may range from once a month in winter to twice a week in late Spring!
2. **Mowing Heights:** determined by type of grass. Measure cutting height with mower on hard surface.
½" - ¾" - bentgrass (must de-thatch annually)
1 ½" - 2" Fine leafed fescue (lowest maintenance, most shade tolerant)
1 ½" - Kentucky bluegrass (should not be more than 10% of grass mix)
1 ¼" - 2" Turftype perennial rye (wears well; needs sun, deep soil)
3. **Rotary or reel mower:** Basically equal if sharp. Reel better for close cut. Important: keep rotary mower blade sharp and replace as necessary.
4. **Clippings:** OK to leave if using a mulching mower. Clippings recycle up to a quarter of the nutrients needed back to the lawn and fungus diseases are suppressed. Downside: grass may be tracked into house; you may have to mow more often; clippings may recycle weed seeds back to lawn. Overall, a mulching mower is a good investment.

B. Watering

1. When and how much:
 - a. Water when grass does not snap back when walked on and/or when grass begins to show a blue-green color.
 - b. GENERAL RULE: ¾" - 1 ¼" total water from rain and irrigation per week during growing season. Depends upon soil type, weather and grass species.
 - c. Measure amount applied with shallow plant saucers. Determine time required to fill majority of the saucers 1" deep. Water that amount of time once a week, or water half that long twice a week. Deep watering = deep roots!
 - d. Slow application rate is best; Impact sprinklers and soakers water at the slowest rates. Oscillating sprinklers are ok. Best to water early in the morning to prevent disease problems, but watering during the night is preferable than during the heat of the day.
2. How to optimize water penetration:
 - a. Use "start and stop method"—sprinkle lightly to get surface moist, wait, then water deeply.

- b. Spray on turf-type wetting agent such as Penaturf. Must be applied before soil becomes dry. Effective for 6 weeks, repeat as necessary.
 - c. Aerate with a hollow-tine power aerator (see "Lawn Renovation").
 - d. Remove thatch if over ½" thick (see "Lawn Renovation").
 - e. Remove moss (see Moss)
3. In case of drought: Increase mowing height to 2" (1 ½" for bent). Do not fertilize a lawn that is not receiving irrigation (an additional stress). Lawn can survive with only 3 deep waterings between May and October. Hand weed or spot spray weeds. A well-cared-for lawn will survive better than a neglected lawn

C. Fertilizing

1. Lawn fertilizer formulations and types:
 - a. Formulations: 3 numbers on fertilizer bag refer to percentages by weight of available nitrogen (N), phosphorus (P) and potassium (K) in bag and are always shown in the same order, N-P-K.
 - (1) Maintenance fertilizers for established lawn N-P-K ratio of 3-1-2 to 6-1-4
 Examples: 21-7-14, 24-8-20, 24-4-8 fertilizers
 Good formulation: 12-4-8 containing 8% sulfur. May be hard to find, get as close as possible. Stay with same formulation if possible.
 - (2) Starter fertilizers for new lawns only: (In established lawns these ratios will stimulate weeds to flower and produce seeds!) N-P-K ratio of 1-1-1 or 1-2-2
 Examples: 10-10-10, 5-10-10, 10-20-20 fertilizers
 - b. Other ingredients: Sulfur (up to 10%) in fertilizer is beneficial. Moss and weed killers are best applied separately. Spring and fall formulations may contain up to 8% iron for moss control. Micronutrient (trace elements) applied yearly only if needed.
 - c. Quick nitrogen release vs. slow nitrogen release:
 Slow is better and more expensive. Quick release produces growth spurt, then lag. Best product includes some quick release with the slow release.
 Quick release: ammonium nitrate, ammonium sulfate, calcium nitrate, urea.
 Slow release: IBDU, methylene ureas, polyon PCU, sulfur-coated urea, urea formaldehyde; organic sources like animal manures, blood, meal, etc.
 - d. Organic fertilizer is slower, more expensive, increases microbiological activity and is only active in warm soil. Generally organic fertilizers will not burn.

2. How much fertilizer?
 - a. Soil test every 3 years to determine pH, calcium, magnesium, phosphorus and potassium available to grass. Test may show that only nitrogen and dolomite are needed rather than a complete fertilizer.
 - b. **GENERAL RULE:** apply 4 lb. actual N and 2 lb. sulfur per 1000 sq. ft. per year with a slow release fertilizer. Divide into 4 equal applications (see "When to fertilize" on page 4).
 - c. Lawns consisting primarily of fine leafed fescue should receive half this amount per year, or ½ lb. N per 1000 sq. ft. per application.
 - d. Amount of fertilizer to apply is determined by: How much N is needed per 1000 sq. ft. AND Formulation numbers (N-P-K) on the bag.
 - e. **Easiest method:** Measure each lawn. Multiply the length times the width. That will give you the square footage of each lawn. The label on the fertilizer bag will tell you how many square feet the ingredients of the bag will cover. If the ingredients in the bag covers 5,000sq ft, and your lawn in 2,000sq ft, then you will need to use approximately 40% of the bag to fertilize that lawn. The most important thing to remember is to write the measurements of each lawn on the wall of the garage. That way you won't lose them.
 - f. Here is the way grounds supervisors do it: To determine how many pounds of fertilizer to use per 1000 sq. ft.: Divide 100 by the first number of bag.
Example: Schedule calls for 1 lb. N per 1000 sq. ft. Fertilizer bag numbers are 12-4-8. Divide 100 by 12 = 8.33. This means you should apply 8.33 lbs. of 12-4-8 fertilizer on every 1000 sq. ft. of your lawn. (Round off 8.33 to 8 lb. per 1000 sq. ft.)
Note: use half the calculated amount for fescue lawns (4 lbs. fertilizer per 1000 sq. ft. in above example). Need help? My fertilizer web page will assist you.

3. For most efficient application of fertilizer:
 - a. mow lawn one or two days before application.
 - b. Apply fertilizer to dry lawn; spreader can cake up when grass is wet.
 - c. Water fertilizer immediately after application to avoid "fertilizer burn."
 - d. Delay fertilizing if weather is hot.

4. Setting the spreader:

Easy Method: Set the spreader at a very low setting. Figure out the approximate amount needed. Apply the fertilizer by going over the lawn several times until the correct amount has been applied. This method gives even, accurate coverage.

 - a. Professional method: Stake about a 200 sq. ft. area of your lawn (10' x 20' for example).
 - b. Weigh amount of fertilizer needed per 200 sq. ft. (for example above, divide the 8 lb. to be used on 1000 sq. ft. by 5 = 1.6 lb., or 1 lb. 10 oz. for 200 sq. ft.). You can use a kitchen scale like one used to weigh flour.
 - c. Set your spreader at what you hope will be the correct setting and spread the weighed fertilizer in the measured area.
 - If you have some fertilizer left in the hopper, increase the setting slightly.
 - If you run out of fertilizer before covering the test area, lower the setting a wee bit.
 - **TEST AGAIN** using different areas of your lawn until you have it right.

This gives you the proper setting to use every time you spread the same formulation. The only time you need to change the setting (and go through all of this again) is if you change to a fertilizer with a different N-P-K number, or get a new spreader.

5. When to fertilize:
Use organic fertilizers on the following (approximate) dates:
 - April 6
 - June 15
 - September 6 or September 15
 - October 15 Late November

(when weather permits)
(slow release synthetic fertilizer)

Note: It generally takes 3 weeks for organic to become active.

D. Lime Requirements

1. If installing a new lawn, do a soil test to determine lime requirements. Up to 100 lb. per 1000 sq. ft. may need to be tilled in to adjust pH. If magnesium is needed per soil test, use dolomite lime.
2. GENERAL RULE for established lawns: 25 lb. dolomite per 1000 sq. ft. every 3 years (or as soil test indicates). Good time to apply: Late December or January so rain will carry into soil.
3. Do not use dolomite lime more often than every 3 years. Do not apply more than 40 lb. per 1000 sq. ft. to an established lawn at a time—a lime layer may form.
4. Lime will tie up available nitrogen in fertilizer. Established lawn: Apply lime at least a month before or after applying fertilizer. New lawn: Optimally, rototill lime with compost. Can apply fertilizer the same day if lime is tilled in. Then the fertilizer can be applied on the surface.

E. Weed Control

Note: A healthy lawn is able to outcompete most weeds

Note: Do not use herbicides if temperature is over 80 degrees or if rain is expected within 6 hours. **KEEP CHILDREN AND PETS OFF TREATED AREA FOR AT LEAST ONE WEEK!**

1. Broad-leaved weeds
Examples: Dandelion, Plantain
Control: Try using straight white vinegar or hand pulling. Vinegar will kill the grass along with the weed. However, the grass generally comes back within a month and the weed doesn't. Test to determine how much straight vinegar is needed. My experience shows that about a 3 second coarse spray usually is successful. If you don't use enough, the vinegar will not kill the weed and it will come back. Vinegar does not work in rainy weather.

Mow lawn to 2" tall, and keep grass thick to shade out weeds. Use hand weeder or spot spray with vinegar. **Caution: Herbicides for weed control in lawns have been associated with health problems. Use sparingly, and with caution.** Avoid weed and feed type fertilizers. These products can be hazardous to trees roots, animal and human health and can endanger the environment.

2. Weed grasses:
Examples: Velvet grass (Holcus species)--thick light green leaves with velvet feel and appearance. Tall fescue (wild species)--dark green, coarse, clumpy.
Control: Dig out by hand and reseed, or spot spray with straight vinegar, Glyphosate (Roundup, etc.). Overseed about a week later. Keep moist until new grass is established. Glyphosate is overused. It is often found in the waterways of Puget Sound. Avoid using it if possible.
Annual bluegrass (Poa annua)-is a special case. It has lime green leaves, can produce seed heads most anytime. It is almost impossible to control. The best way to deal with it is to aerify and over seed each spring or fall. Then the Poa will blend in with the other grasses.
3. Small-leafed, hard-to-control weeds:
Examples: Buttercup—loves moist areas and low fertility, Chickweed, English Daisy, Japanese Clover, Dutch White Clover
Control: Keep your lawn fertilized and maintain a 2 inch height.

4. Moss

Good cultural practices (proper mowing, fertilization, watering) will enable grass to outcompete moss. For shade use fine leafed fescue, reduce shade or replace grass with more shade tolerant plants
Control: (temporary unless above is followed): Commercial moss killers like ferric sulfate (liquid), ferrous sulfate (granular) work well. Apply in March and again in November. Remove dead moss in spring with power dethatcher and overseed thin area. **Warning:** These products can be hazardous to children and pets. Keep them off the lawn for at least a few days after application.

5. Lawn mushrooms

Proper lawn fertilizer and dethatching will reduce incidence of mushrooms, often seen with fall rains. Fairy rings are persistent; may have to live with them! Mow the lawn to remove fruiting bodies (mushrooms) or practice golf on the mushrooms.

III. Lawn Renovation

Good cultural practices can postpone the need for renovation. Do in mid-March if weather permits or mid-September at time of fertilization.

Important: Soil must be moist but not soggy. If wet in March, may delay up to May 1. If September is hot and dry, may delay up to October 15th.

- A. Mow lawn as short as possible to about $\frac{3}{4}$ " mower height. (Only mow to low height if dethatching will be undertaken, but not if only aerification is going to be done.)
- B. Remove thatch if over $\frac{1}{2}$ " thick (spade up wedge of turf and measure thatch layer). Use rented power rake and dethatch in perpendicular directions. Rake up.
- C. Aerate with rented hollow-tine aerator, also in both directions. Mow with rotary mower to disperse soil plugs.
- D. Take up sod from high and low spots, adjust grade with native soil, replace sod.
- E. Optional: top dress with coarse top soil not to exceed $\frac{1}{2}$."
- F. Overseed with 50-50 mix of fine leafed fescue and turf-type perennial at rate of 2 lb. seed per 1000 sq. ft.
Note: Always use certified seed.
- G. Fertilize with lawn starter fertilizer at rate of 1 lb. N per 1000 sq. ft.
- H. Lightly rake surface.
- I. Go over lawn with roller. Seed must be in contact with soil to germinate.
- J. Gently water seed and fertilizer. Soil surface must be kept moist until seed germinates (may need 6 waterings a day in warm weather) and through next 3 mowings.
- K. Mow whenever grass is $\frac{1}{3}$ taller than recommended height.

IV. Lawn Replacement (and New Lawn)

Replacement may be needed if the following conditions exist:

- 30% of lawn is weeds (including weak grasses) and/or moss.
- Thatch accumulation is 2" or more
- Lawn is more than 15 years old and is mostly bent grass (unless one is willing to deal with a bentgrass lawn)
- Lawn is an unworkable mess

Mid-March and September are best times to replace lawn. Important: Get soil test results before proceeding.

Important: Soil must be about as moist as a squeezed sponge, but not soggy for either of the following methods. If wet March, delay up to May 1; soil structure is damaged if worked when soggy. If September is hot and soil is parched, my delay up to October 15; aerator can't penetrate dry soil.

A. Sod cutter method:

Advantage: Tilling alleviates soil compaction, allows integration of lime, organics or top soil into soil.

Disadvantage: Tilling may damage tree roots. Weedy grasses may resprout.

1. Remove sod with rented sod cutter. Try to get below the thatch layer. Roll up and remove sod.
2. Rototill soil, first 8"-12" deep with lime and soil amendments. General rule is to till 100 # of dolomite lime with 2" of compost 6" deep. Caution: Till soil to crumbs, not powder.
Caution: Delay rototilling if a ball of soil is wet (it should be about as moist as a squeezed sponge).
3. Smooth soil with steel rake, removing rocks, old wood, etc. Firm with lawn roller so that footprint shows not more than ½" deep.
4. Apply starter fertilizer at the recommended rate.
5. In sunny areas, seed or sod with 50-50 mix of fine leafed fescue and turf-type perennial ryegrass. Increase fescue proportionally to amount of shade. Use 6 lb. seed per 1000 sq. ft. Note: if buying unmixed seed, 2 parts rye and 1 part fescue by weight will yield 50-50 mix (fescue seed is much smaller than rye). Note: Always use certified seed.
6. If sodding, lay rows tight together in an offset pattern.
7. Seed with either a broadcast or drop spreader. Divide seed quantity in half and apply twice in perpendicular directions. Keep seed out of borders.
8. Lightly rake surface.
9. Go over area with lawn roller. Seed must be in contact with soil.
10. Gently water in seed or sod. Soil surface must be kept moist until seed germinates and through first 3 mowings. May need 6 waterings per day in warm weather.
11. Mow whenever grass is 1/3 taller than recommended height.
12. If new lawn yellows, fertilize with organic fertilizer at the recommended rate.

V. Disease Control

Lawn diseases are of small concern here. Routine use of a 3-1-2 ratio fertilizer containing sulfur such as 12-4-8-S (8% sulfur) or simply using such a fertilizer for the fall application is helpful on lawns with suspected disease. If the problem appears to be serious, take a sample to a Master Gardener Clinic.

VI. Insect Control

European Crane Fly (*Tipula paludosa*) is the only significant insect pest here. Lawn has irregular yellow spots, especially in sun reflected areas or in wet areas. Damage most noticeable in March and April, especially after warm winters. Lawn can end up pure mud.

Larvae, called “leatherjackets,” do all the damage. By spring they are brown, bumpy, hairless “worms” about $\frac{3}{4}$ ” long with black heads. Monitor starting in early March: (1) measure off a one square foot area of lawn and pour on a pan of lukewarm dishwater or (2) dig up a one square foot patch of lawn, 2” deep or (3) inspect at night with a flashlight. Count the leatherjackets you find.

Treatment: Follow good cultural practices—a well-cared-for lawn can tolerate up to 30 or 40 larvae per square foot! If more than 40 leatherjackets per square foot are found AND lawn is showing damage, control may be necessary.

Apply Bioneem or nematodes in early April (soil is generally too cool earlier for insecticide to work well). Bioneem is an environmental friendly pesticide that is less likely to harm birds, waterfowl and other wildlife than chemical insecticides. Bioneem will only kill about 40% of the larvae, but that is usually enough to prevent serious damage. Promptly remove dead larvae from grass surface.

VII Frequently Asked Questions

Question: How much lime should I use to get rid of moss:

Answer: Unfortunately lime has no effect on moss! Refer to Moss section for control..

Question: I "weed and feed" my lawn. How long do I have to wait before overseeding?

Answer: You should wait 6 weeks—grass seedlings are sensitive to lawn herbicides.

Question: I used weed and feed fertilizer on my lawn. How long must I compost the clippings before using them on my vegetable garden?

Answer: Don't compost grass clippings that were treated with herbicide. If the clippings already have been composted, wait a year, and use the compost where no food crops will be grown. Never use fresh grass clippings that have been treated with herbicide in the garden.

Question: Is it all right to use Groco or sewage sludge as organic matter for my new lawn?

Answer: Yes, but see below.

Question: How much organic matter do I need to add to my soil before planting my new lawn?

Answer: Generally it is best to have about 25 to 30% organic matter by volume for a good lawn.

Question: My soil is pure hardpan. How can I have a good lawn?

Answer: When hardpan is moist but not saturated, spread 2" organic matter such as Cedar Grove compost, Steerco (steer manure and sawdust) or Groco (sewage sludge and sawdust) over it. Add lime if needed, and rototill 6 to 8" deep. If tiller can't penetrate at least 6" into hardpan, spread top soil 8"- 12" over it. Fertilize and reseed per Lawn Replacement section.

Question: I used peat moss to top dress my lawn but it didn't improve. Why not?

Answer: Top dressings must be porous like sand or sandy loam. Peat moss can form a nonporous layer which makes your lawn hard to water. There is evidence that using compost tea, or spreading a thin layer of compost can lower disease incidence on lawns. Nutrient rich compost tea can actually be used as a fertilizer

Question: Where can I find good grass seed for this area?

Answer: Good quality grass seed isn't cheap. Go to a quality garden center and buy certified seed.

Question: I mistakenly applied Casoron on my lawn, thinking it was fertilizer. What do I do now?

Answer: You have a problem! Casoron is soil active for 6 months to a year. Rent a sod cutter, set it to cut deep. Roll up and remove turf. Plant radish seeds and see if they germinate. If so, follow procedure under Lawn Replacement on page 10. If not, apply activated charcoal at rate of 10 pounds per 1000 sq. ft. and try radish seeds again. OR simply spray your dead grass with green dye and wait until next year to re-establish your lawn.

VIII. Publications, etc.

Available from county Cooperative Extension offices at a nominal charge. To order by phone from the King County office call 296-3900, Monday through Friday

- EB 1600 Annual Bluegrass Control in Turfgrass
- EB 1016 Corticium Red Thread of Turfgrass
- EB 0938 Disease Control in Home Lawns
- EB 0713 Diseases of Turf Grass
- EB 0713S Supplement to above
- EB 0856 European Crane Fly: A Lawn Pest
- *FG 0041 Fertilizer Guide for Home Lawns, etc. for WWA
- EB 1108 Fusarium Patch of Turf
- KC 0049 Grassland Farming—Seed & Fertilizer Recommendations
- *EB 0482 Home Lawns
- *EB 0924 Lawn Renovation
- *EB 0607 Lawn Weed Control
- EB 1028 Moles
- KC 0109 Moles
- KC 0020 Moss in Pastures
- EB 0939 Ophiobolus Patch Disease of Turf
- *EB 1096 Role of Lime in Turfgrass Management
- EB 0684 Saving Water—Lawns and Other Turf
- EB 1083 Slime Molds on Lawns and Other Areas
- EB 0974 Soils for Western Washington Lawns
- KCSG 10 Sound Gardening Series: Lawns—Proper Watering
- EM 4749 Structural and Turf Demossing
- PNW 0299 Turfgrass Seeding Recommendations
- EB 1280 Turfgrass Soil-Water Relationships
- EB 1117 Thatch and Its Control
- EB 1090 Watering

Especially Helpful

King County Cooperative Extension has an audio tape library available 24 hours by touch-tone phone. Phone 296-DIAL and ask for gardening tape list.

IX. Lawn Calendar

A. Monthly Schedule

- March: Dethatch with power rake if over ½" thick. Use a hollow-tine aerator if soil is compacted. (May delay both up to May 1 soil too wet)
- April 1: Treat for European Crane Fly Larvae only if more than 40 per sq. ft. AND if lawn shows damage.
- April 6: 1st application of good quality fertilizer containing sulfur with N-P-K ratio of 3-1-2 at rate of 1 lb. N per 1000 sq. ft. (Half as much for fescue). Delay 2 weeks if using synthetic fertilizer
- June 15: 2nd application of good quality fertilizer as above.
- September 6: Use a hollow-tine aerator if soil is compacted. 3rd application of good quality fertilizer (with sulfur). Delay both until weather cools if drought. Delay 2 weeks if using synthetic fertilizer.
- October 15: 4th and final application of good quality fertilizer. Do this in **late November** if using synthetic fertilizer. Make sure the synthetic fertilizer is slow release.
- November 1: (every 3 years) -- Apply dolomite at rate of 25 lb. per 1000 sq. ft., or per soil test.

B. Periodic & Ongoing

1. Anytime:
 - Apply 1" water per week as needed
 - Mow when grass is 1/3 above cutting height
 - Rake leaves off grass once a week in fall
 - Spot treat or hand pull weeds
2. Every 3 years:
 - Get soil test
 - Apply dolomite at rate of 25 lb. per 1000 sq. ft. (or follow soil test recommendations)