Putting your garden to bed

Gretel Anspach
Lifetime Master Gardener
Massachusetts Master Gardener Association

Standard List of things to do now

- Testing the soil
- Cutting back
- Cleaning up
- Planting
- Protecting
- Prepping for spring

The wake-up call

<u>Same</u>

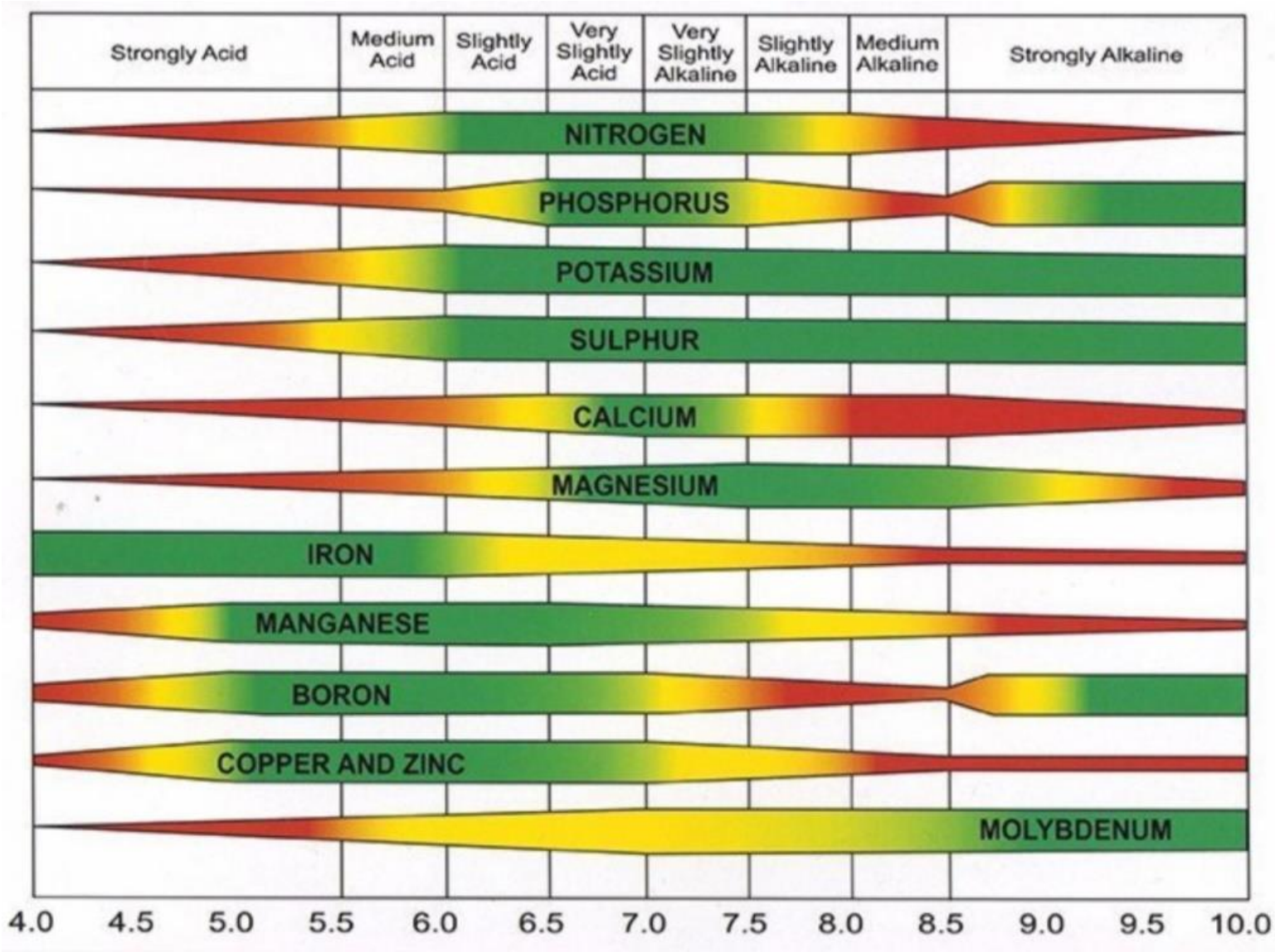
- Variety
- Seed pack
- Planting day
- Planting person
- Depth

The “root” cause

pH 6.5

pH 5.3

Nutrient Availability



https://growappalachia.berea.edu/2019/05/02/feeding-your-plants/

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Soil and Plant Tissue Testing Laboratory

Ordering Information

- Overview & Order Forms
- Payment Policy
- Master Crop Code List for Routine Soil Analysis

Ordering Information

To submit a sample to the lab, download the appropriate form and follow the sample collection guidelines provided. Complete the submission form and either mail or hand deliver to the lab. Payment must accompany sample(s) submitted with checks or money order made payable to University of Massachusetts.

One cup of dry soil per sample is needed for Routine Soil Analysis. See **Sampling Instructions for Routine Soil Analysis** for detailed instructions on collecting a soil sample. *If you are unable to open this document, it can also be accessed from the Resources tab. If you still cannot open the document, you may request a copy by emailing soiltest@umass.edu. We are currently working toward resolving this problem.*

Note: When submission forms are opened with Adobe Reader or Acrobat, information may be typed in on the screen, then printed and sent to the lab.

Soil Forms:

- Routine Soil Analysis - Use This Form for Home Grounds and Gardening
- Routine Soil Analysis - Use This Form for Turf, Ornamentals, and Landscaping
- Routine Soil Analysis - Use This Form for Commercial Vegetable and Fruit Crops
- Routine Soil Analysis - Use This Form When Submitting More Than Six Soil Samples And Attach To

https://soiltest.umass.edu/ordering-information

Cutting back

Cut back in fall to…

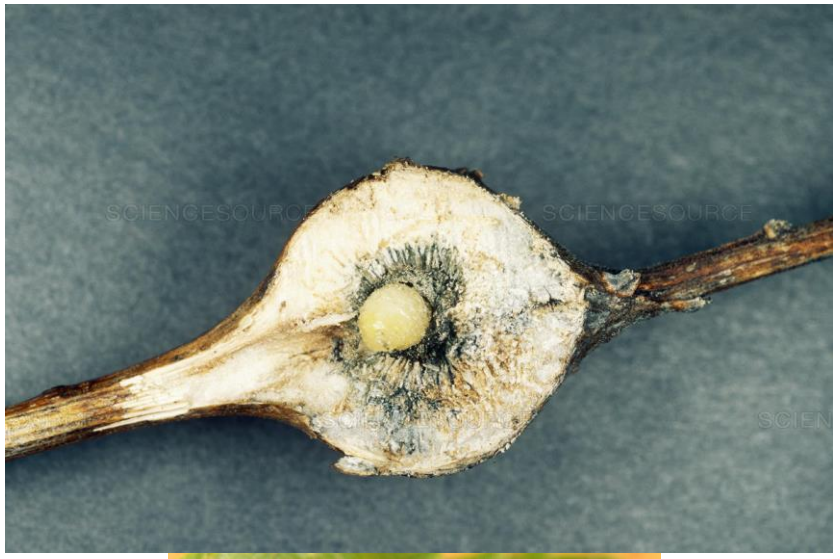
- Remove seed heads so plant spreads less aggressively
- Clear the area for early spring growth
- Remove shelter for “bad” bugs
- Remove disease spores
- Reduce labor in spring

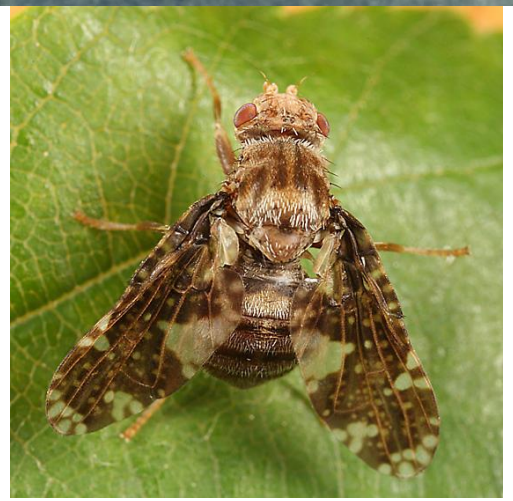
Cut back in spring to…

- Leave seed heads for winter interest and bird food
- Act as mulch through the winter
- Provide shelter for “good” bugs
- Make it easier to find the plant in early spring

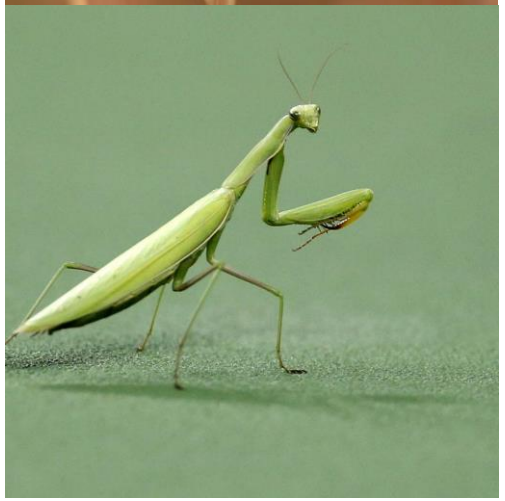
Insects over-wintering on stalks

Aphids





Goldenrod gall fly



Praying mantis

Recommendations

<u>Cut back in fall</u>

- Iris (*Iris spp*.) – remove iris borer eggs
- Hosta (*Hosta spp*.) – if slugs are a problem (slug eggs)
- Peony (*Paeonia spp*.) – remove botrytis spores
- Yarrow (*Achillea spp*.) – reduce self-seeding
- Garden phlox (*Phlox paniculata*) – remove powdery mildew
- Beebalm (*Monarda spp*.) – remove powdery mildew
- Anything else with a disease problem

<u>Cut back in spring (or not at all)</u>

- Everything else

Cutting back in fall

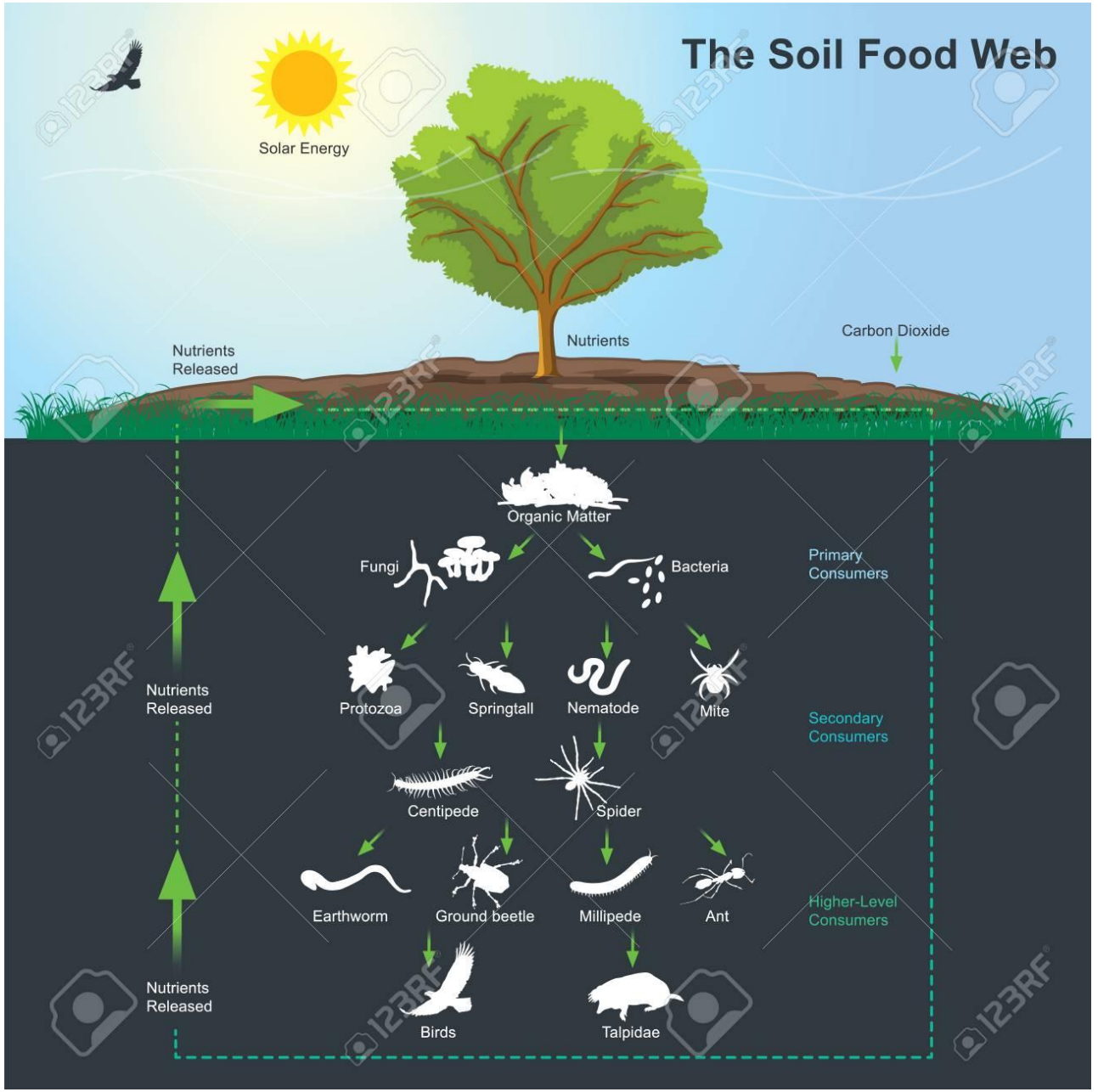
- Wait until a few hard frosts to kill the plant top.
- Use bypass pruners or hedge clippers to make the cuts.
- Leave about 2” of stem to mark the spot and act as mulch.
- Don’t remove any new growth – some plant grow new leaves at base in fall.
- Discard diseases foliage. Mulch / compost the rest.

Cleaning up

- Mulch some leaves.
- Cut back everything above ground in vegetable garden to avoid setting seeds, harboring disease.
- Empty, clean, disinfect containers.
- Clean and store stakes, cages, garden ornaments.
- Clean and sharpen tools.

Dead leaves

- Original thinking
  - Remove all leaves in fall
  - Keep the garden looking tidy all winter
- Next generation thinking
  - Remove all leaves, chop them up and replace them
  - Put nutrients back in the soil
- Latest thinking
  - Chop / mow the leaves on the lawn
  - Don’t do anything with the leaves in your beds



https://www.123rf.com/photo_97566451_stock-vector-information-graphic-of-soil-food-web-illustration-.html

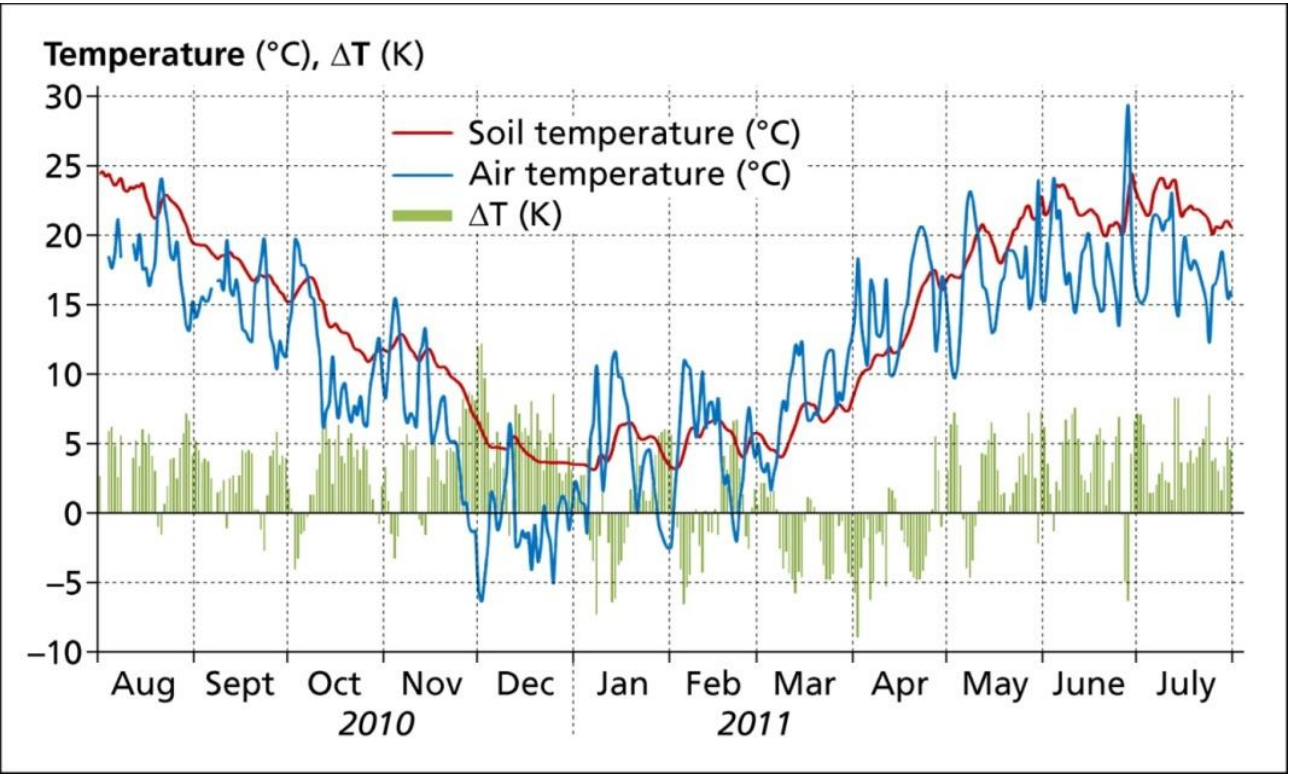
Beds & Leaves – don’t do anything

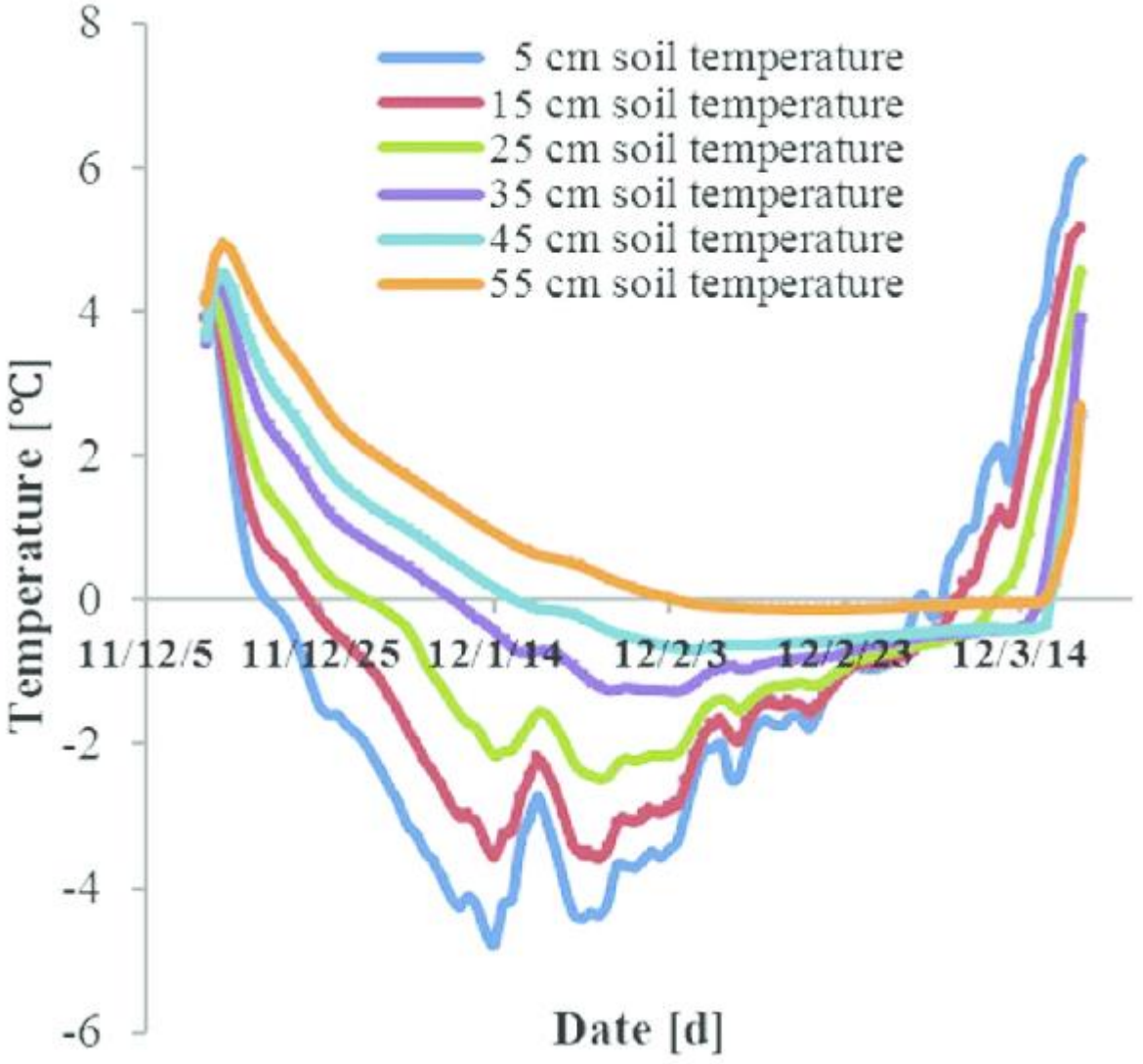
- Insects that overwinter in fallen leaves and other debris
  - Bumblebees and other native bees
  - Butterfly larvae (caterpillars, chrysalises)
  - Ladybugs, assassin bugs, lacewings, big-eyed bugs, minute pirate bugs, damsel bugs, ground beetles,
- Insects and seeds provide food for birds
- Leaves act as mulch for plants

"How often already you've had to be told,
Keep cold, young orchard. Good-by and keep cold.
Dread fifty above more than fifty below.“

Good-by and Keep Cold, by Robert Frost

Soil temperature versus Air Temperature





https://www.intechopen.com/books/human-and-social-dimensions-of-climate-change/climate-change-on-the-urban-scale-effects-and-counter-measures-in-central-europe

https://www.researchgate.net/figure/Soil-temperature-dynamics-in-different-depths-in-the-same-winter-irrigation-treatment_fig8_292946465

Lawns

- Mow to 2 – 2 ½ inches spring and fall, 3 inches in summer
- Keep grass watered @ 1 inch per week – use rain gauge
- Fertilize in early fall (might still be time)
- Aerate soil if you walked on it a lot
- Reseed if grass is thin
- Prevent leaves from smothering grass
  - If just a few, run over them with lawn mower
  - If solid carpet of leaves, collect them for compost (rake, blow or mow)

Vegetable Gardens – insects

- Common garden pests
  - Colorado potato beetles – overwinters at the field edge as adults
  - Cucumber beetles – overwinters at the field edge as adults
  - Imported cabbage worm – overwinters on or under host plants as larvae or pupae
  - Mexican bean beetle – overwinters at the field edge as adults
  - Squash bugs – overwinters away from garden as adults
  - Squash borers – overwinters in soil under host plant as pupae
  - Tomato hornworm – overwinters in soil near host plant as pupae
- Remove plants in cabbage family if you had cabbage worm
- Till lightly to expose larvae and pupae to birds and freezing temperatures

http://massmastergardeners.org/common-vegetable-garden-insects-pests/

Vegetable Gardens – diseases

- Common vegetable garden diseases
  - Early blight (tomatoes) – overwinters in the ground
  - Downy mildew (cukes) – cannot overwinter here
  - Powdery mildew (squash) – overwinters in sheltered infected plant debris

- Remove infected plant debris in fall
- Lightly till soil to expose spores to freezing temperatures

https://ag.umass.edu/home-lawn-garden/fact-sheets/disease-management-in-home-vegetable-garden

Tools, etc.

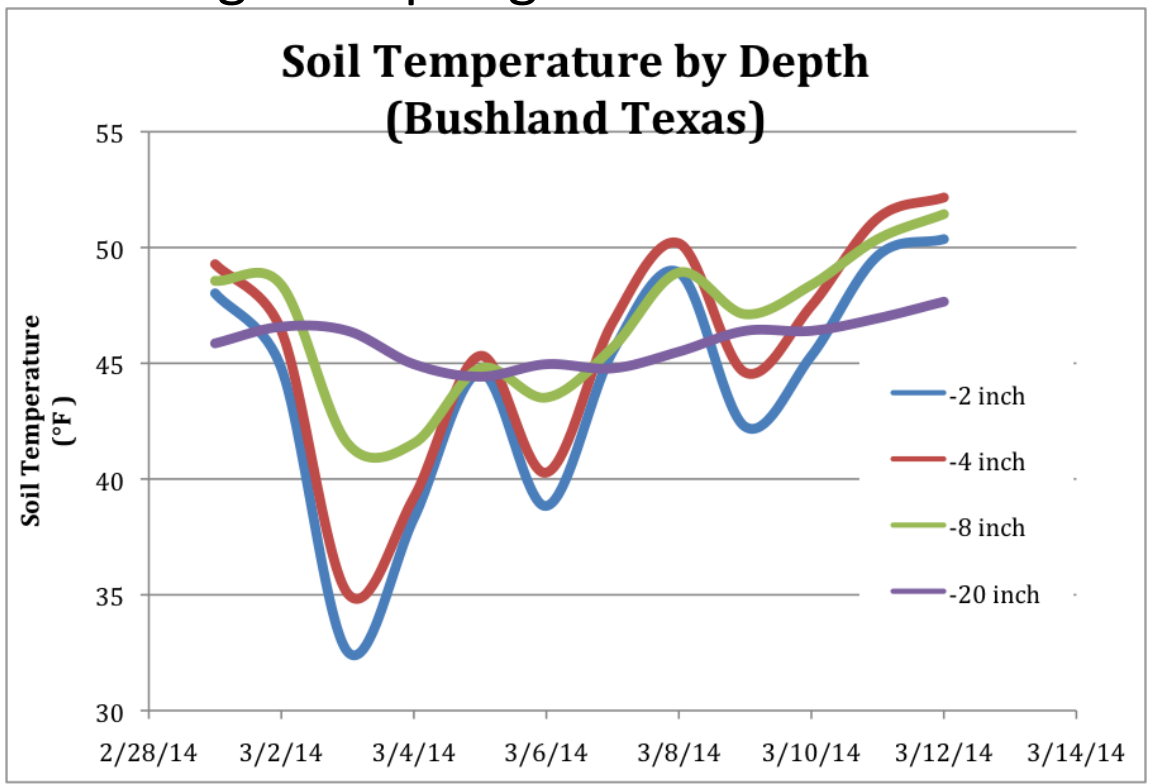
- Collect stakes, hoses, pots (except huge ones), tools etc.
- Drain and hang hoses
- Tip wheelbarrows to avoid collecting water
- Pots and containers
  - Knock / scrape off dirt
  - Spray with / dip in 10% bleach solution
- Tools
  - Knock / scrape off dirt
  - Spray with 10% bleach solution to kill disease spores
  - Sharpen as needed
  - Wipe with oiled rag (linseed or vegetable oil works fine; avoid petroleum oil since the rag becomes toxic waste)

Plant

- Plant trees and shrubs
- Plant bulbs, garlic, rhubarb, poppies
- Sow spinach, mache for early spring harvest
- Plant a cover crop on bare soil – winter wheat, crimson clover, hairy vetch

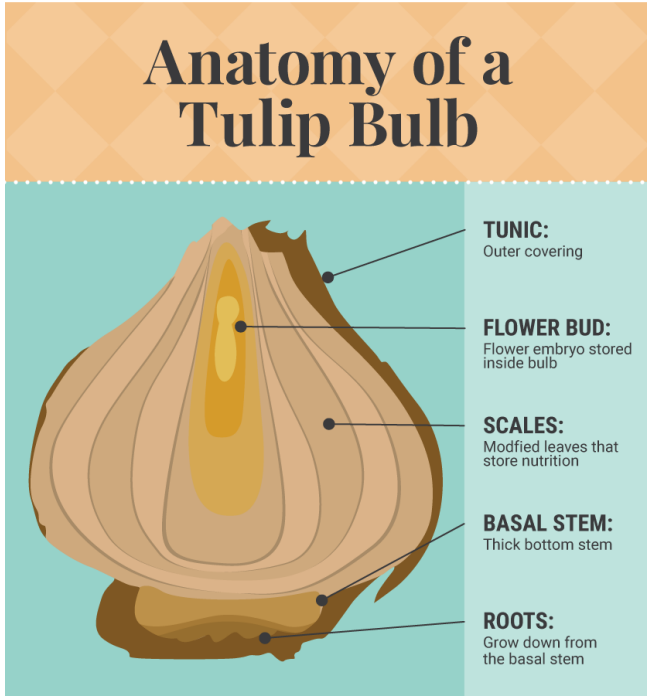
Planting in fall

- Root development continues long after air temperatures feel too cool
  - Trees and shrubs can grow roots well into January
  - Even bulbs can start roots in fall
- Seeds remain dormant
  - But will germinate as soon as temperatures are right in spring
  - (unless they rot first)
- Many bulbs require cool period



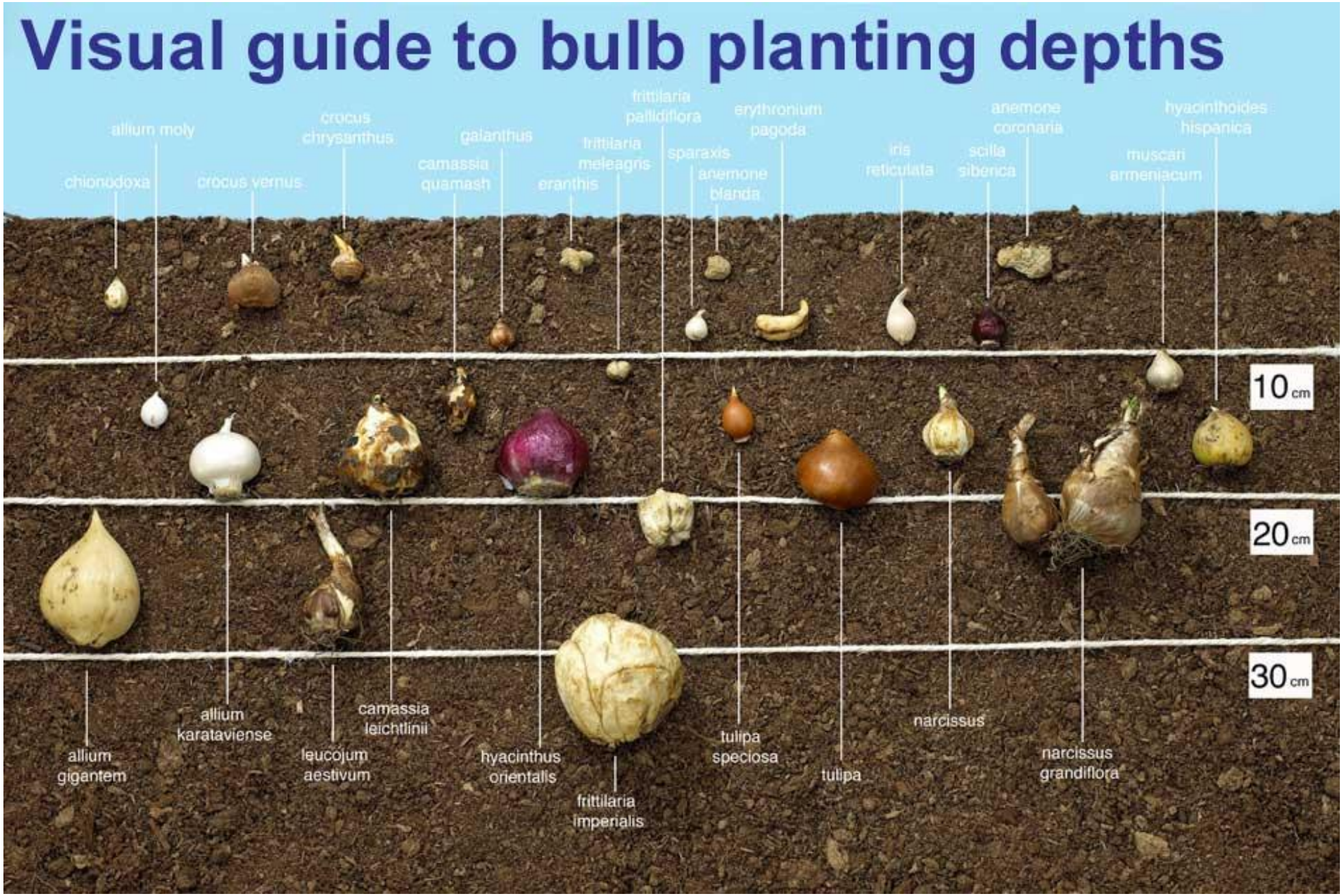
Bulbs

- Genetic adaptation to survive 2 dormant periods – hot dry summers and cold winters
- Bulbs that require chilling off
  - Crocus (not really a bulb)
  - Daffodil
  - Hyacinth
  - Muscari
  - Snowdrop
  - Tulip







https://www.vanmeuwen.com/bulb-planting-depth-guide

Cover Crops

<u>Bare soil</u>

- Less work
- Easier to get started in spring
- Looks tidy
- Warms up fast in spring

<u>Cover crop</u>

- Adds nutrients to soil
- Prevents erosion
- Reduces weed incursion

Protect

- Shield plants that animals might eat – tree guards
- Protect shrubs under snow lines, shrubs near salt spray

- Mulch around grafted roses – use soil, not hay. Prune to top of mulch. Wait till cold weather. Remove by April 1

- Dig up tender bulbs – dahlias

Protect from wildlife

Phloem and vascular cambium have nutrients deer, rabbits and voles will eat in winter

Cherry tree girdled by rabbit

Can also use repellent: Bobbex or Deer Off

Evergreen “pruned” by deer

Rabbit / vole fence

Deer fence

Using canvas

Goal: prevent sunscald
Not recommended: bugs can hide under wrapping

Goal: block wind
Not recommended: vole habitat, no photosynthesis

Goal: prevent snow from splitting tree
Not recommended: vole habitat, no photosynthesis

Better solutions: wall on south side, windward side, or between tree and street

Or tying tree together

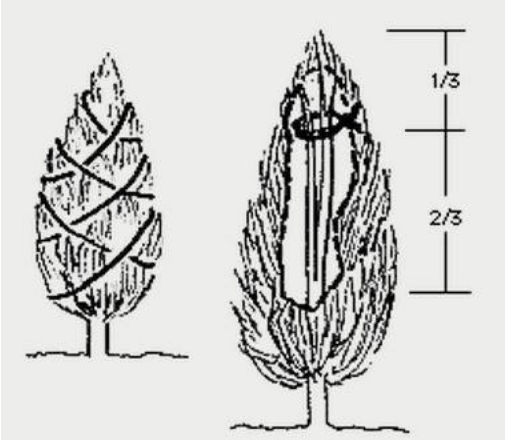


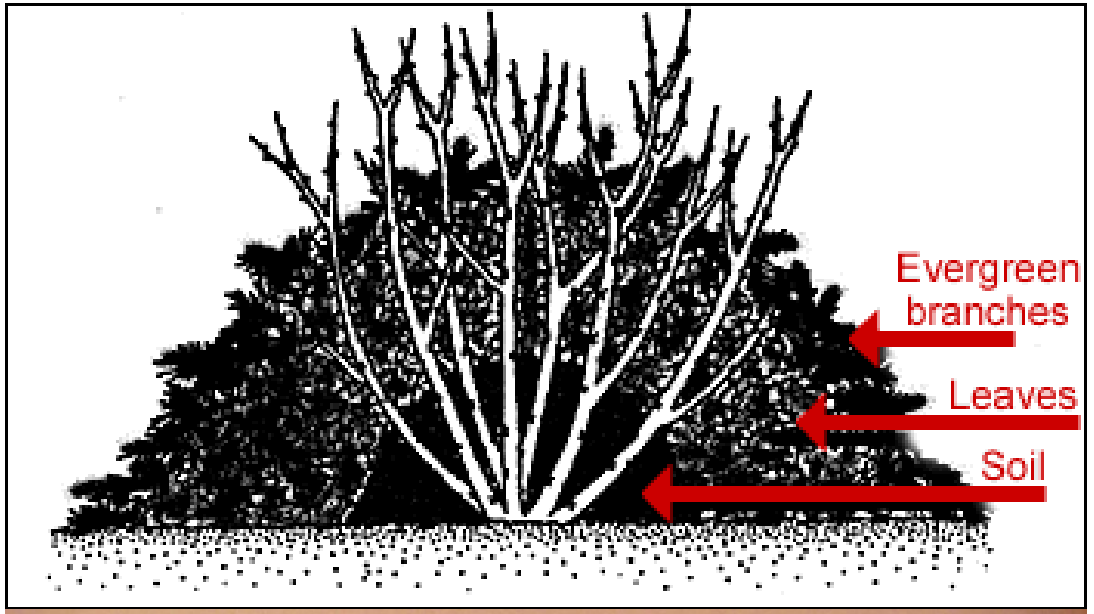
Figure 3. Protecting trees from snow or ice-damage.

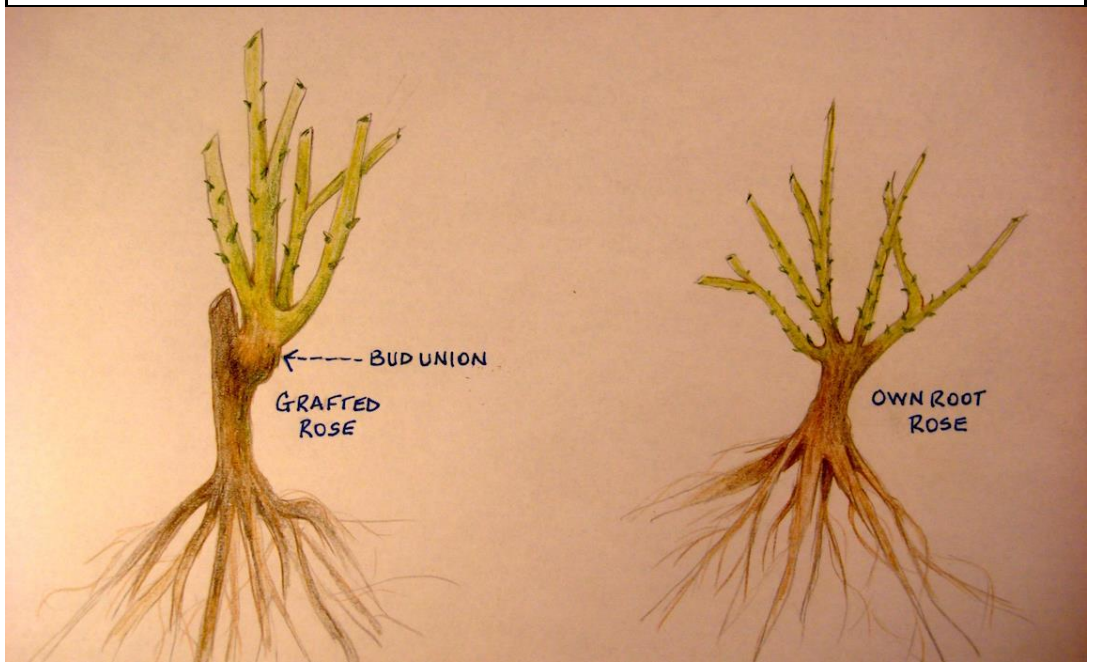
Using wood

- Useful for:
  - Shrubs where snow slides off roof
  - Weeping shrubs – hard to tie up
- But:
  - What will you do when the plant gets bigger?
  - Better to prune it to survive snow

Roses

- Some roses aren't quite hardy here
- Protecting growing base increases chances of survival
  - Especially if the rose is grafted
- If you didn't protect the rose over the last couple of winters, you don't need to do this.
- If you don't have a rose yet, buy a hardy one.



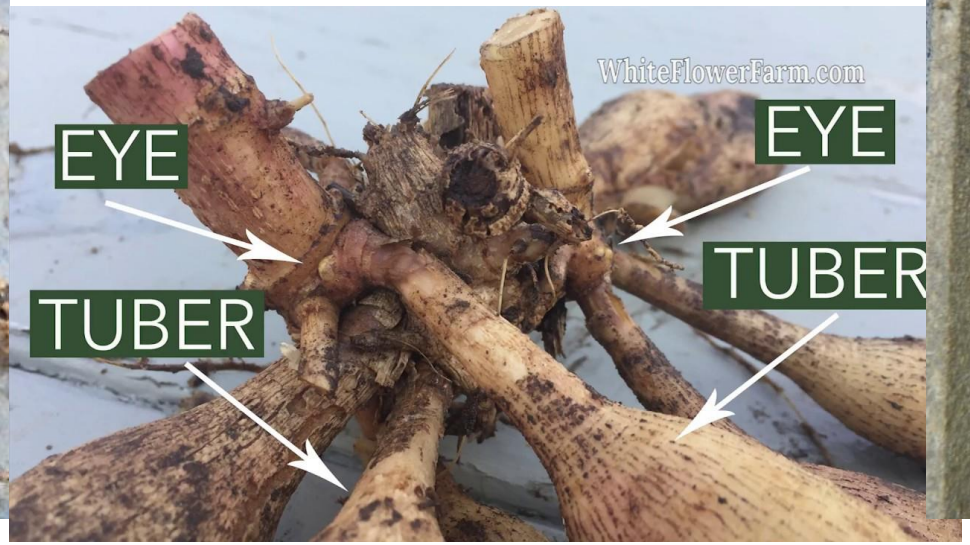


Dig up tender bulbs

- Dig as soon as possible after foliage is frost killed – delays can start the bulb rotting
- Label the bulb immediately!
- Shake off excess soil and cut the stems to a couple of inches
- Leave out – shade, dry, well-ventilated – for a few days to cure
- Discard any that look shriveled or rotten
- Store the dried bulbs in peat moss, vermiculite, saw dust, etc. so that the bulbs don’t touch each other
- Keep till spring in unheated garage – above freezing but not warm.

Tender bulbs

- Caladium
- Calla lily
- Canna
- **Dahlia**
- Elephant ears
- Gladiolas
- Tuberous begonias



https://ngb.org/2019/09/27/storing-dahlias-for-winter/

Prep for spring

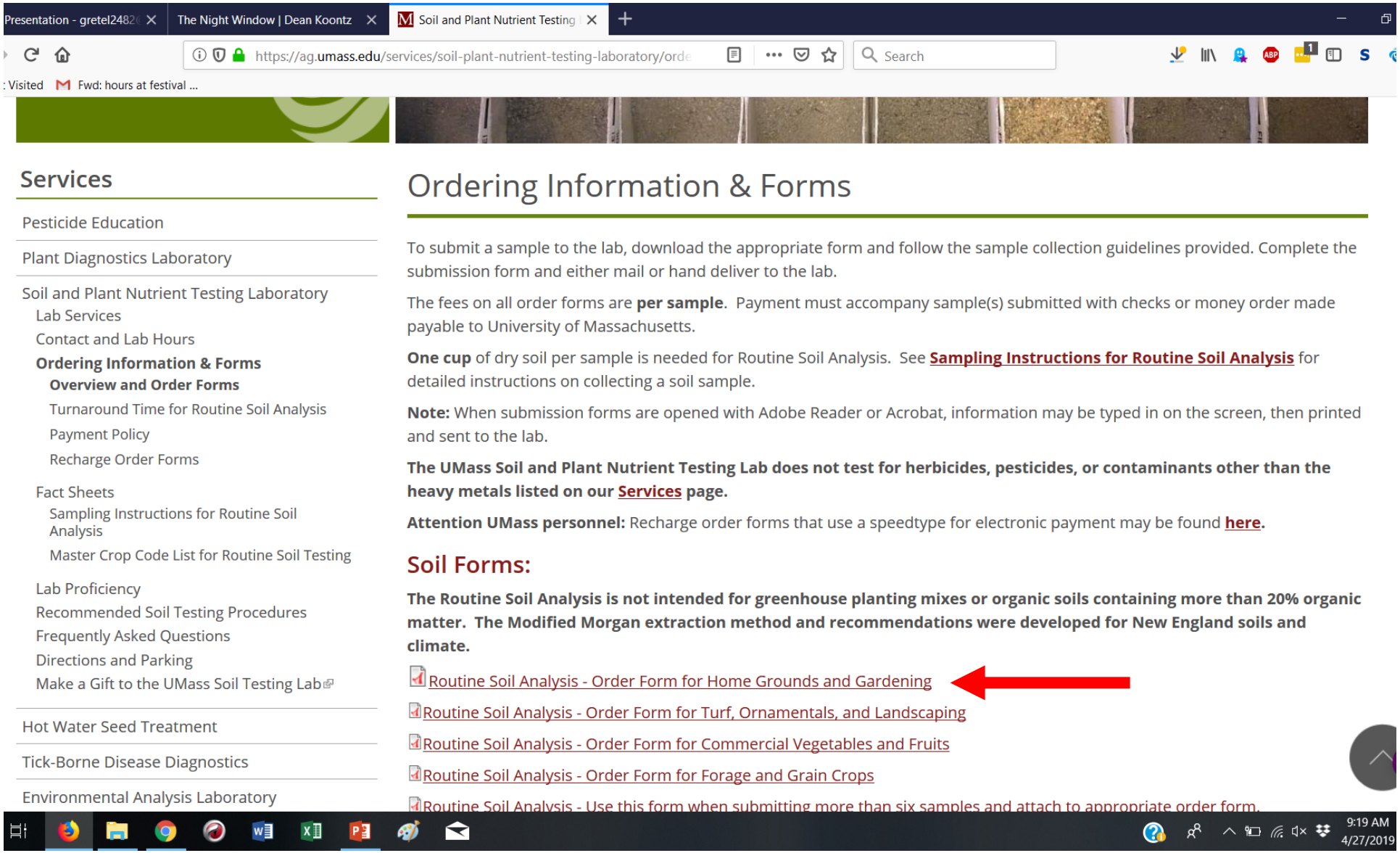
- Weed perennial weeds, winter annuals
- Tag plants you want to divide in spring
- Add compost and manure or chopped leaves to beds
- Till the soil lightly
- Make notes
- Look around

References

- Spring Pruning Guide:
  - https://extension.oregonstate.edu/sites/default/files/documents/12281/springpruningguide.pdf
- Fall lawn care:
  - https://pss.uvm.edu/ppp/articles/falllawn.html
- Sharpening garden tools:
  - https://www.youtube.com/watch?v=VZQ8ZUtyydI
  - https://extension.unh.edu/blog/how-clean-and-sharpen-your-pruners
- Cover crops:
  - https://extension.umn.edu/how-manage-soil-and-nutrients-home-gardens/cover-crops-and-green-manures
- Roses:
  - https://pss.uvm.edu/ppp/articles/roseswin.html

In general, trust .edu first, .org second, .com last.

Garden Math



https://ag.umass.edu/services/soil-plant-nutrient-testing-laboratory/ordering-information-forms

UMass Extension

UMass Soil & Plant Nutrient Testing Laboratory
Paige Laboratory, Room 203
161 Holdsworth Way
Amherst, MA 01003
(413) 545-2311
soiltest@umass.edu
http://soiltest.umass.edu

USE THIS FORM FOR ROUTINE SOIL ANALYSIS – HOME GROUNDS AND GARDENS

Visit our website to download a copy of Sampling Instructions for Routine Soil Analysis, which includes a description of routine and optional soil tests offered. Send your sample(s), completed submission form and payment to the address listed above. Enclose check payable to UMass for $20 for each sample plus additional fees for optional tests requested below.

Main Contact	Send Copy to	Method of Receiving Results
Name:	Name:	☐ **US Mail** (Please include $2 per order for postage & handling)
Business Name:	Business Name:	
Street Address:	Street Address:	☐ **Email**
City, State, Zip	City, State, Zip:	
Phone:	Phone:	
Email Address:	Email Address:	

LAB # (Leave blank)	Sample ID (You create this)	Approx. area Represented by Sample (Sq. ft. or Acres)	Crop Code, limit of 3 (See reverse side of this form)	Routine Analysis ($20.00)	Organic Matter ($6.00)	Soluble Salts ($6.00)	Nitrate ($8.00)
				☑	☐	☐	☐
				☑	☐	☐	☐
				☑	☐	☐	☐
				☑	☐	☐	☐
				☑	☐	☐	☐
				☑	☐	☐	☐

Order Total $_____.

Office Use Only	
Received	Due
Check#	PO#
Cash	Date

"Routine Soil Analysis - Order form for Home Grounds and Gardening"

Crop Codes for Home Grounds and Gardens

To receive lime and nutrient recommendations on your test report, you must specify the appropriate Crop Code(s) on your soil sample submission form. These recommendations are based on analytical results for your sample. Please select up to three Crop Codes that best describes your management objectives from the list below.

Home Lawns – *Recommendations given per 1,000 sq. ft.*

Description	Crop Code
Lawn-New Establishment	HA1
Lawn-Maintenance	HA2

Home Gardens, Trees and Shrubs – *Recommendations given per 100 sq. ft.*

Description	Crop Code
Home Vegetable Garden	HB1
Home Vegetable Garden, Asparagus only	HB1A
Flowers, Roses, & Herbs	HB3E
Deciduous Trees, Shrubs & Vines-New Establishment	HC1E
Deciduous Trees, Shrubs & Vines-Maintenance	HC1M
Needle Leaf Trees & Shrubs-New Establishment	HC2E
Needle Leaf Trees & Shrubs-Maintenance	HC2M
Acid-loving Trees, Shrubs, & Groundcover-New Establishment	HC3E
Acid-loving Trees, Shrubs, & Groundcover-Maintenance	HC3M
Home Blueberries-New Establishment	HD1E
Home Blueberries-Maintenance	HD1M
Home Brambles-New Establishment	HD2E
Home Brambles-Maintenance	HD2M
Home Strawberries-New Establishment	HD3E
Home Strawberries-Maintenance	HD3M
Home Grapes, American Varieties-New Establishment	HD4E
Home Grapes, American Varieties-Maintenance	HD4M
Home Grapes, European Varieties-New Establishment	HD5E
Home Grapes, European Varieties-Maintenance	HD5M

You can use up to 3 of these crop codes for each soil test sample.

Top of 1st page of report

UMass Extension

Soil and Plant Tissue Testing Laboratory
203 Paige Laboratory
161 Holdsworth Way
University of Massachusetts
Amherst, MA 01003
Phone: (413) 545-2311
e-mail: soiltest@umass.edu
website: soiltest.umass.edu

Soil Test Report

Prepared For:
Gretel Anspach
164 White Pond Rd
Hudson, MA 01749

gretel@alum.mit.edu
978-502-6366

Sample Information:
Sample ID: Tre

Order Number: 14725
Lab Number: S150515-907
Area Sampled: 2000 sq ft
Received: 5/15/2015
Reported: 6/5/2015

This is the code you used to identify your soil test when you sent it in. Make sure you write down what part of your property it refers to!

Middle of 1st page – what's in your soil

Results

Analysis	*Value Found*	*Optimum Range*
Soil pH (1:1, H2O)	5.5	
Modified Morgan extractable, ppm		
Macronutrients		
Phosphorus (P)	3.1	4-14
Potassium (K)	31	100-160
Calcium (Ca)	315	1000-1500
Magnesium (Mg)	41	50-120
Sulfur (S)	3.8	>10
Micronutrients *		
Boron (B)	0.1	0.1-0.5
Manganese (Mn)	1.5	1.1-6.3
Zinc (Zn)	0.7	1.0-7.6
Copper (Cu)	0.2	0.3-0.6
Iron (Fe)	7.8	2.7-9.4
Aluminum (Al)	74	<75
Lead (Pb)	0.7	<22

* *Micronutrient deficiencies rarely occur in New England soils; therefore, an Optimu range found in soils and are for reference only.*

- <u>Lead (Pb)</u>
- < 100 ppm (parts per million)
  - No action required
- 100 ppm – 300 ppm
  - Avoid bare soil if there are children around who may eat soil
  - Wash or peel any edibles grown in the soil
  - Grow for fruit rather than roots or leaves
- > 300 ppm
  - Cover (e.g. lawn, mulch), and/or
  - Remediate (pH > 6.5, add compost), or
  - Remove

Check lead level, ignore the rest

Bottom of 1st page – how it compares

Soil Test Interpretation

Nutrient	Very Low	Low	Optimum	Above Optimum
Phosphorus (P):				
Potassium (K):				
Calcium (Ca):				
Magnesium (Mg):				

1 of 2 ***Sample ID: Tre*** ***Lab Number S150515-907***

You can ignore this part too

2nd page – what to do!

Recommendations for Deciduous Trees, Shrubs & Vines-Maintenance

Limestone (Target pH of 6.0)	Nitrogen, N	Phosphorus, P2O5	Potassium, K2O
	lbs / 100 sq ft		
5	.1 - .2	0.25	0.25

Comments:

-For instructions on converting nutrient recommendations to fertilizer applications in home gardens, lawns and landscapes, see Reference "Step-by-Step Fertilizer Guide for Home Grounds and Gardening" (listed below).
-Maintaining a 2 to 4 inch organic mulch will help conserve moisture and improve soil conditions.

References:

Home Lawn and Garden Information	http://ag.umass.edu/interest-areas/home-lawn-garden
Step-by-Step Fertilizer Guide for Home Grounds and Gardening	https://soiltest.umass.edu/fact-sheets/step-step-fertilizer-guide-home-grounds-and-gardening

General References:

Interpreting Your Soil Test Results	http://soiltest.umass.edu/fact-sheets/interpreting-your-soil-test-results
For current information and order forms, please visit	http://soiltest.umass.edu/

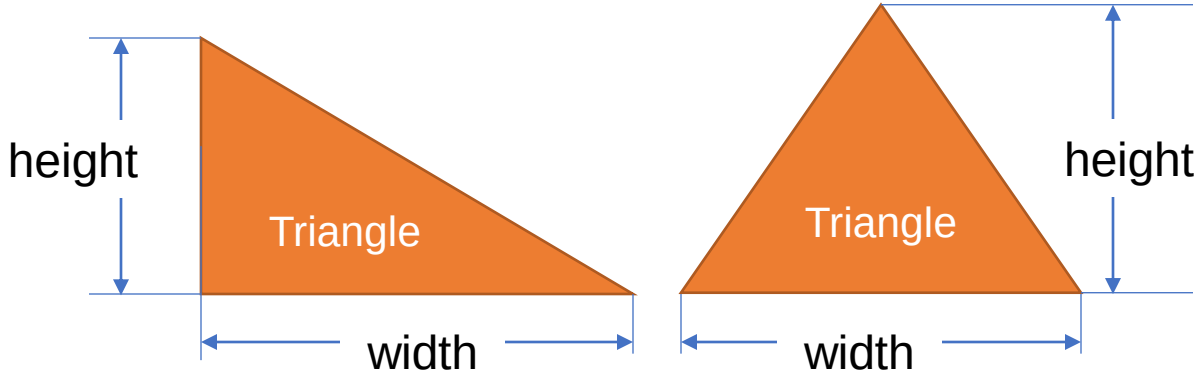
Recommendation: Add 5 # lime
.1-.2 # nitrogen
.25 # phosphorus
.25 # potassium per 100 square feet

How many square feet do I have?

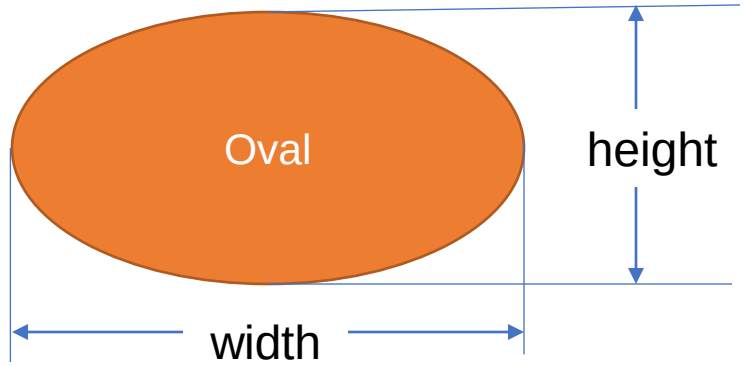
- Decide whether the space looks more like a rectangle, triangle or circle
  - You can divide the space up as needed
- Based on the shape, use the area formulae to decide what are the key dimensions to measure
- Measure key dimensions of the area
  - Measuring tape
  - Google
- Use the standard math formulae to compute area

Standard math formulae

Area = height x width



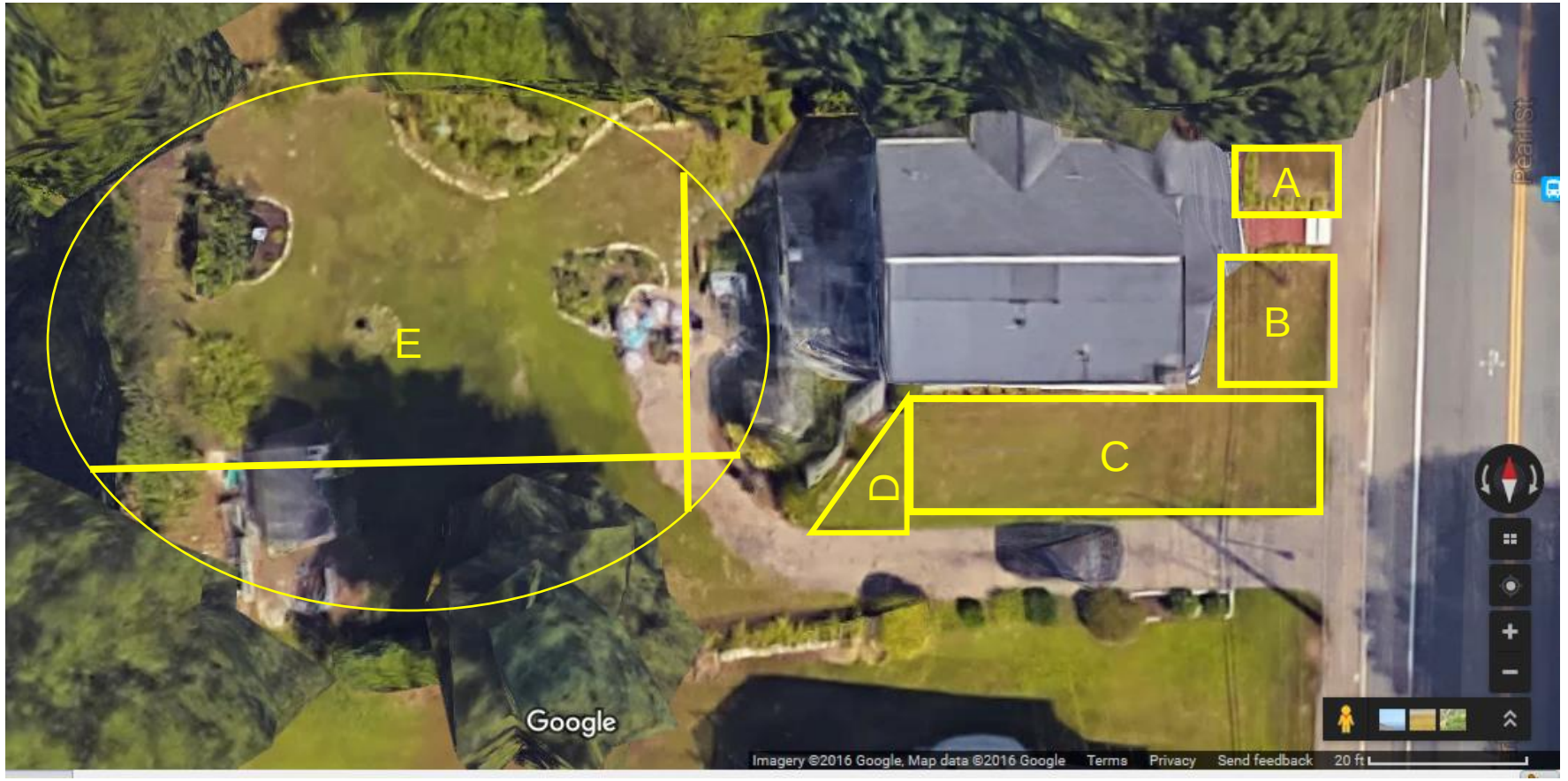
Area = ½ x height x width (a triangle is half a rectangle)



Area = 3.14 x 1/4 x height x width

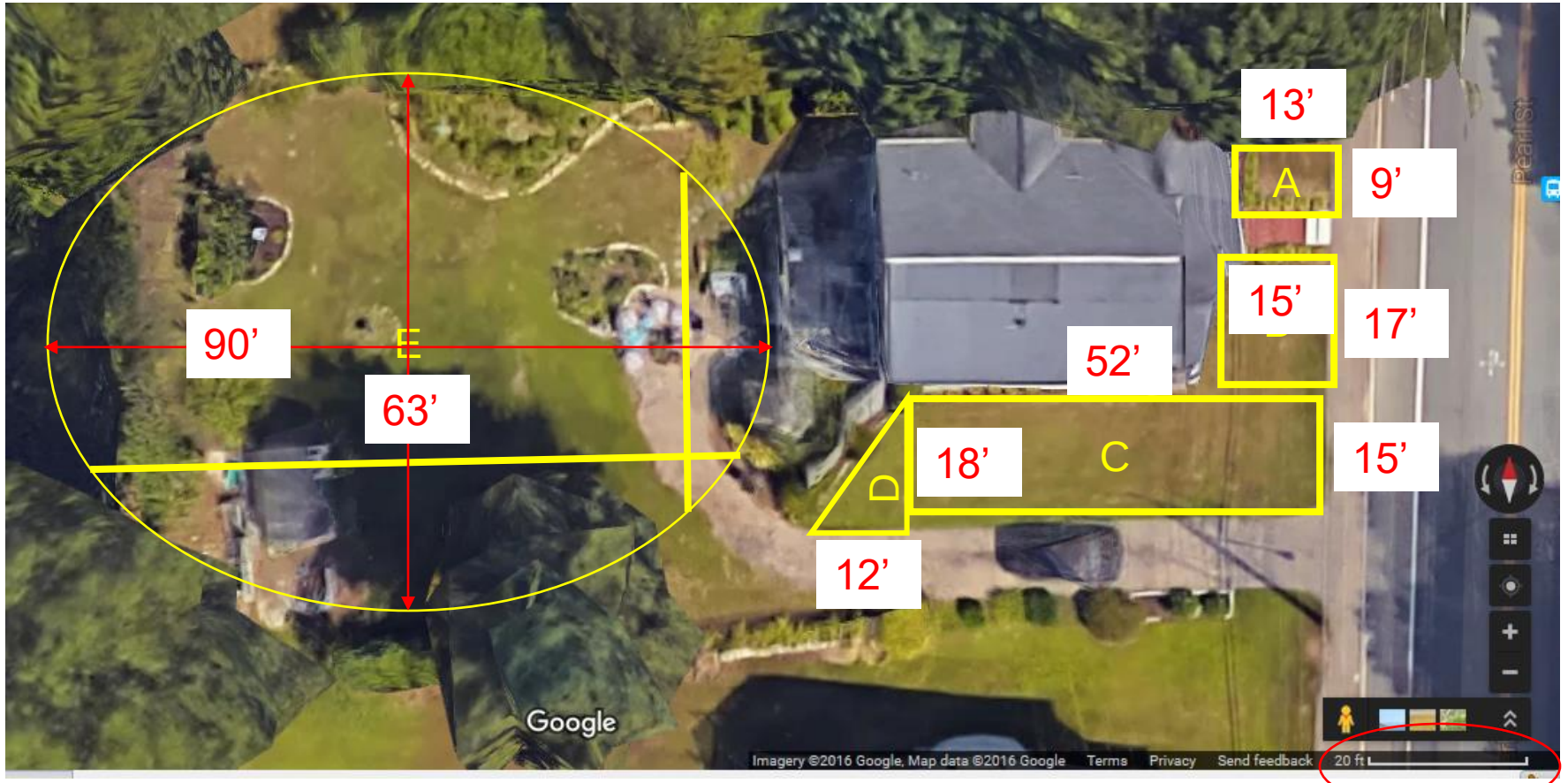
Google your address

Draw shapes



Doesn’t have to be a perfect fit
Can eyeball “cut-outs” – e.g. probably half of the circle is lawn

Measure key dimensions



Compute areas of shapes

- Front lawn:
  - Rectangle A: 13’ x 9’ = 117’
  - Rectangle B: 15’ x 17’ = 255’
  - Rectangle C: 52’ x 18’ = 936’
  - Triangle D: ½ x 12’ x 18’ = 108’
  - Total Front Lawn Area: 1416 (call it 1400’)
- Back lawn:
  - Oval E: 3.14 x ¼ x 63’ x 90’ = 4451’
  - Back lawn is probably half that circle = 2225’
  - 2200 is probably close enough

Lime

- Recommendation: 5# lime/100 square feet
- Front lawn: 1400 square feet -> 70# of lime
  - (5 * 1400 / 100)
- Back lawn: 2200 square feet -> 110# of lime
  - (5 * 2200 / 100 = 110)

Fertilizer

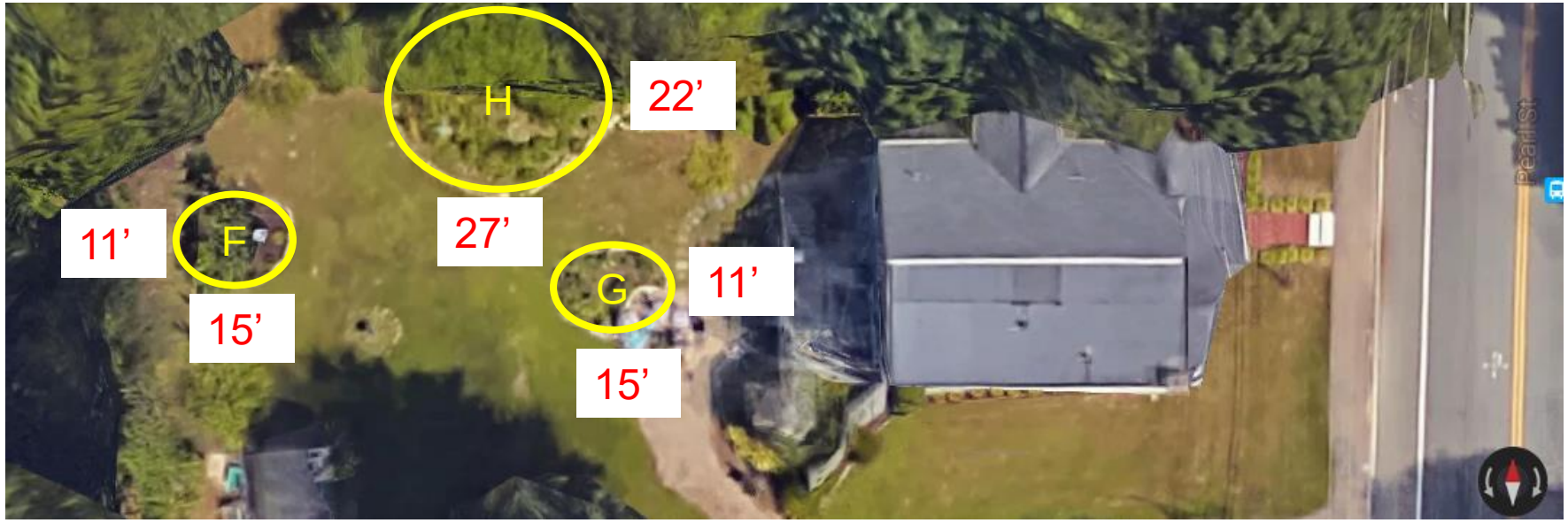
- 3 numbers on each bag
  - N-P-K
  - Nitrogen – Phosphorus – Potassium (always in that order)
- Numbers are the percent of that element in the fertilizer by weight
  - 50 pound bag of 14-14-14
    - 14% nitrogen – 7# nitrogen
    - 14% phosphorus – 7# phosphorus
    - 14% potassium – 7# potassium
  - 30 pound bag of 12-32-06
    - 12% nitrogen – 3.6# nitrogen
    - 32% phosphorus – 9.6# phosphorus
    - 6% potassium – 1.8# potassium

Fertilizer

	Nitrogen	Phosphorus	Potassium
Recommendation	.1-.2#/100 sq. ft.	.25#/100 sq. ft.	.25#/100 sq/ft
Front Yard (1400 sq. ft.)	1.4-2.8# total	3.5# total	3.5# total
Back Yard (2200 sq. ft.)	2.2-4.4# total	5.5# total	5.5# total

- Can add 3 elements separately
- Easier to add balanced fertilizer
  - 10-10-10 (50# bag) would be 5# of each – close enough for back yard

Mulch



- Oval F: 3.14 x ¼ x 11’ x 15’ = 130 sq ft
- Oval G: 3.14 x ¼ x 11’ x 15’ = 130 sq ft
- Half of Oval H: ½ x 3.14 x ¼ x 22’ x 27’ = 233 sq ft
- Total bed area: 493 sq ft (500 sq ft)

Mulch math

- How much mulch do you need to cover 500 square feet 2” deep?
- Volume needed (cubic feet)
  - Area x depth
  - 500 square feet x 2 inches (but can’t multiply inches by feet)
  - 1 foot = 12”, so 2” = 2/12 of a foot (1/6)
  - 500 square feet x 1/6 foot = 83 cubic feet
- Volume needed (cubic yards)
  - 1 cubic yard = 27 cubic feet (3’ x 3’ x 3’)
  - 83 cubic feet = 83/27 cubic yards = 3 cubic yards