Quick and dirty study guide for the final

• All lecture notes are on my web page – all except the practical stuff is there. Exam questions are directly related to handouts and lecture notes, field trips and farm labs.
• Re-read the assigned readings for better understanding.
• [Emphasis on topic in class] = [likelihood of appearing on exam.]
• I strongly suggest you write your own study guide using my headings and (mostly) your notes. You will probably start with 4+ pages: Lots of editing and rewriting to get it to 2 pages. Consider making flash cards for the difficult topics.

1. Good Farm Management/Sustainable Agriculture/Organic farming
The 3 goals: Ecologically sound, socially just, economically viable

A) Ecological:
  a) Soil health: preserve and improve soil organic matter, prevent erosion, rotate crops
  c) Minimize off farm inputs
  d) Design cropping system to resist pests, diseases, and nutrient imbalances

B) Social:
  Treat people (and animals) fairly

C) Economic:
  Viable business

*Given a practical farm situation, you should be able to match it to the correct goal(s).

2. The field. *Know why and how we do each step*. Mow cover crop into small pieces —> lime or gypsum and/or compost —> Cover crop incorporation —> till —> list —> side-dress fertilizer (or not) ——> make stale beds ——> control weeds without disturbing bed ——> plant crop, plant insectary ——>, irrigation. Special things about blueberries, Delicata, onions, carrots, strawberries.

Leek harvesting and quality. Soil sampling, soil pit.

3. Organic and the law. Organic certification

*Key concept: The goals of sustainable agriculture and good farm management generate the standards for certified organic farming. Organic standards and consumer demand generate an economic reason to apply sustainable agriculture and good farm management techniques.

• The National organic program (NOP) = federal government = the rules
• The National Organic Standards Board (NOSB). Sets the standards for the NOP
• The National List. What types of materials are allowed or not allowed. Synthetics.
• OMRI/WSDA. List of specific materials that are allowed.
• Certification organizations = agents of the federal government = measure compliance.
• Organic systems plan = contract with certifier showing how farmer will meet NOP standards. Living document which updates.

What does the government care about the most? Answer: Off-farm inputs, contamination, selling non-organic as organic.
What don’t they care about much? Seeds, soil management, people, wildlife, economics

4. **Cover crops and crop rotation.** Benefits: Disease, weed, and insect control; organic matter; nitrogen; soil structure; erosion. Drawbacks: time, water, resources.

5. **Marketing.** Characteristics, and the advantages and disadvantages of the different choices from a farmer’s perspective: *Grower shipper packers: the relationship between farmer and seller. Wholesale (Crown), Direct to retail (New Leaf, High Ground), Farmers markets (Madrone, Fogline), CSA (High ground, Fogline).

6. **Crop planning.** Opportunities, resources, soil health. Advantages and disadvantages of growing many crops or a few. Main resources: land, water, labor, management, equipment. Managing resources optimally. Planting schedules. Cabrillo farm crop plan: know why is each crop chosen and the priorities: Learning opportunities; mimicking real farm systems; Monocots, dicots, alternate hosts; marketing, etc.

**POST MIDTERM**

7. **Soil physical properties.** Soil texture, and Soil structure.

Soil components: mineral, biological, pore space.
Surface area to volume, and negative charges.
Why do we like high o.m loam? Texture, structure reasons.
Compaction and aggregation.
The importance of microorganisms and climate for soil structure and fertility.

8. **Soil fertility.**
Soil tests.

Nitrogen budgets: Crop needs [including losses] (-) residual in soil (-) release from organic matter, (-) addition from cover crop (-) addition from compost (-) addition from fertilizer = amount to add. Be able to do K and P budgets too.

Understand the calculations:
a) amount of nutrients in fertilizers, compost, cover crops
b) Acres to sq ft and vice versa. Know how many sq ft in an acre: 43560
c) Amounts of nutrients to add per acre

CEC: know what it is, where it comes from, how we use it. Know what base saturation is and why we care (Ca:Mg ratio, Na, N/K/Ca fertility).

Lime (CaCO3) vs. Gypsum (CaSO4). Benefits of gypsum: pH, Ca, soil structure, Na removal, crusting, Ca:Mg ratio, Sulfur.

Micronutrients. Why we are careful with them.