SDSU Extension

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SDSU Extension

VOLUNTEER Master Gardener Program

Wrapping up Your Garden

Yankton Seed Library

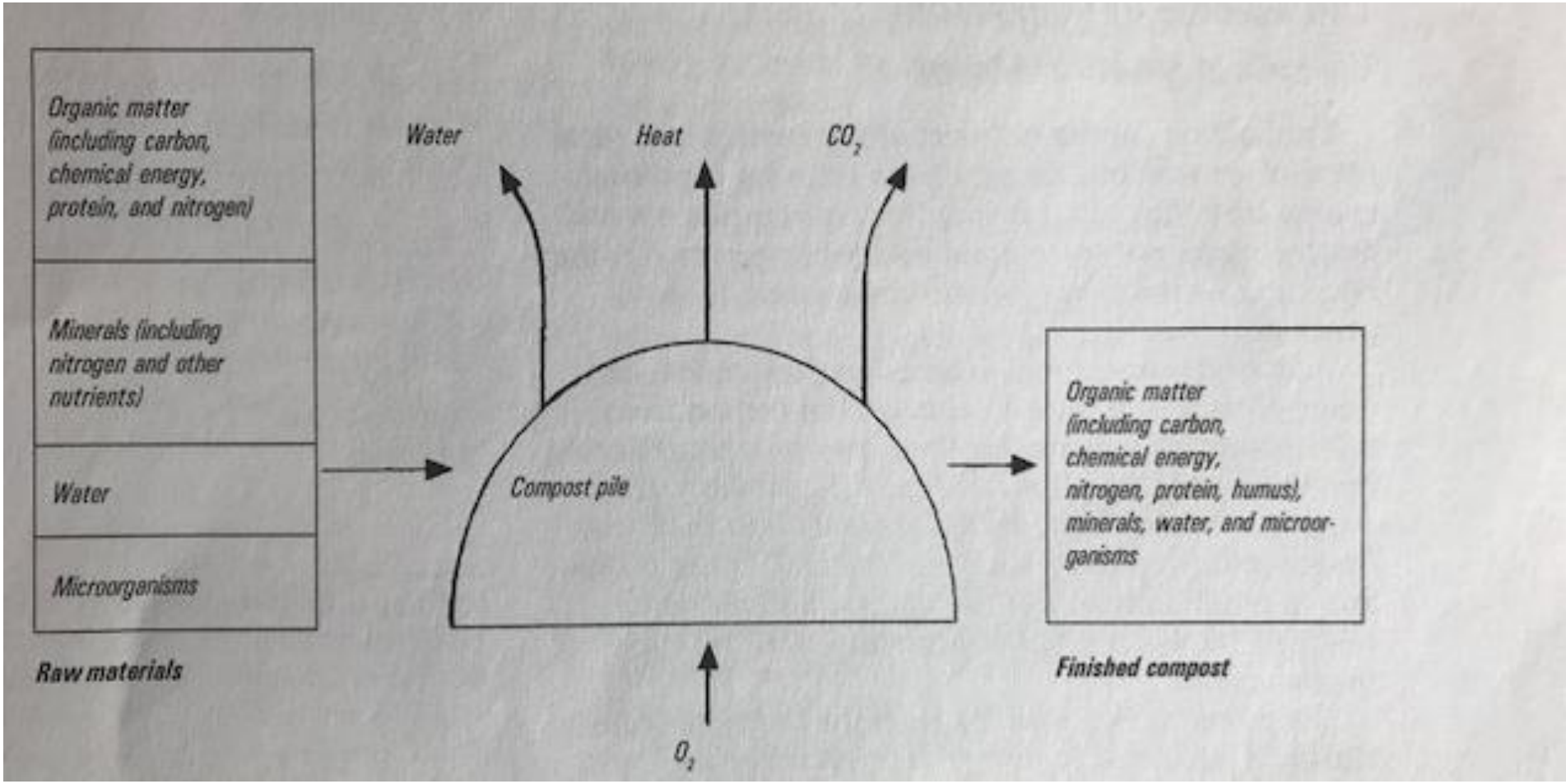
What is Compost?

- A mixture of decayed or decaying organic matter used to enrich garden soil
- Usually made by gathering plant material into a pile or bin and letting it decompose as a result of the action of aerobic bacteria, fungi, and other organisms.
- Important way to reduce waste that is burned or dumped into landfills
- Yard waste and vegetable scraps make up as much as 20-30 %of household garbage.

Cycle of Growth and Decay

- Plants grow by capturing energy from the sun, carbon dioxide from the air, and nutrients and water from the soil.
- When plants die, they become raw materials for composting process.
- Microorganisms, fungi, insects, worms, mites and other creatures convert the carbon from dead plants into energy for their own bodies and eventually back into the soil.
- Plants and microorganisms use the carbon and the cycle begins again.

Science of Composting



Types of Composting

- Fast (hot) Composting
  - Balance food, water, and air in the compost pile to favor the growth of thermophilic (heat-loving) microorganisms
  - Compost piles heat rapidly to 120 to 150 degrees Fahrenheit
  - High temp kills most weed seeds and pathogens but not beneficial fungi
  - Takes extra effort but produces high-quality product quickly
- Slow (cold) Composting
  - If ideal conditions not maintained for hot composting, microorganisms still break down waste but slower and less effective at killing weed seeds and pathogens
  - Easy and convenient

Managing the Decay Process

- Important to provide the proper moisture and air content as well as organic materials to provide a rich energy source for bacteria
- Raw materials separated into energy materials, bulking agents, and balanced materials

Energy Materials

- Provide the nitrogen and high-energy carbon compounds needed for fast microbial growth
- High moisture, low porosity, high nitrogen
- If used without bulking agents, are too wet and dense to allow air into compost pile and will have a foul “rotten egg” smell

Energy Materials

- Grass clippings
- Fresh dairy, chicken, or rabbit manure
- Fruit and vegetable waste
- Garden trimmings

Bulking Agents

- Dry, porous materials that help aerate the compost pile.
- Low moisture, high porosity, low nitrogen
- Too low in moisture and nutrients to decay quickly on their own

Bulking Agents

- Wood chips
- Sawdust
- Grass hay
- Wheat straw
- Corn stalks

Balanced Raw Materials

- Have both energy and bulking-agent properties
- Low to medium moisture, medium porosity, medium nitrogen
- Compost readily without being blended with other ingredients
- Handy for ensuring the success of hot compost piles

Balanced Raw Materials

- Ground-up tree and shrub trimmings
- Horse manure and bedding
- Deciduous leaves
- Legume hay

Agents NOT to add

- Dairy products
- Diseased or insect ridden plants
- Fat, grease lard
- Meat, fish, bones
- Black walnut tree leaves or twigs
- Western red cedar
- Pet waste, cat litter
- Coal, charcoal

Easy agents to add

- Fruits and vegetables
- Egg shells
- Coffee grounds and filters
- Shredded newspaper
- Yard/garden trimmings
- Dryer and vacuum cleaner lint
- Tea bags
- Sawdust
- Cardboard

Compost Mixture

- Mixing bulking agents with energy sources provides the right balance of moisture, air, and nutrients for rapid composting.
- Mixture of one part energy source with two parts bulking agent (by volume) gives a reasonable mix for rapid composting

Particle Size

- Small particles have more surface area for microbial activity and are easier to mix
- Grinding, cutting, smashing, or chopping reduces particle size
- Hot composting requires a relatively uniform particle size 1/8 to ½ inch in diameter

Mixing

- Pile must be big enough to hold heat
- Hot piles decay faster than a cold pile
- Small piles hold less heat and dry out faster
- A pile of about 1 cubic yard is big enough for year-round composting

Moisture

- All material in the pile must be moist but not soaking wet
- Check moisture when turning, should feel moist but not wet.
- Usually in South Dakota you will need to add moisture

Aeration

- The microorganisms need oxygen
- Pile needs to be porous enough to pull in outside air to replenish oxygen as it is used
- Bulking agents create a porous pile
- As pile decomposes, it will settle, reducing aeration.
- Turning or adding more bulking agents improves aeration

Microorganisms

- Raw materials usually contain all the microorganisms needed to make compost
- Not necessary to add soil or compost starters with special microorganisms
- Best source of microorganisms is finished compost

Nutrients

- Occur in the raw materials and usually additional nutrients are not needed
- If compost is mainly bulking agents, nitrogen fertilizer may be beneficial. Best way to add is to dissolve fertilizer in water and wet the pile with a dilute solution
- Compost additives such as blood meal and bone meal are organic fertilizers and do not contribute anything magic to the compost pile

How to Make Compost

- Piles work well
- Containers
  - Look neater
  - Easier to shield from pests
  - Simple or fancy
  - Old pallets, lumber, mesh fencing, cinder blocks

Compost Bins

Compost Bins

Preparing Slow Compost Pile

- Simply mix non-woody yard waste into a pile and let sit for about a year
- Add fresh wastes by opening the pile, placing wastes in the center and covering them
- Helps aerate pile and buries fresh wastes to not attract pests
- One other option is to bury waste in the garden. Dig a hole or trench about a foot deep, add a few inches of waste, mix with soil and refill trench with soil

Preparing Hot Compost Pile

- Collect material for a pile at least 1 cubic yard in volume (5 feet wide by 3 feet high holds about a cubic yard)
- Use 2 parts bulking agent to 1 part energy material
- Chop, shred, mow, or smash material to decrease particle size
- Mix with a pitchfork
- Check moisture level

Preparing Hot Compost Pile

- Continue adding energy material and bulking agent, mixing, and checking moisture until the pile is built
- Turn the pile weekly and add water when needed
- Cover pile during rainy periods so it does not get too wet

Curing

- Regularly turned pile stays hot (120 to 150 degrees) for several weeks to a month
- Will shrink to about half original volume
- Needs to sit about 4-8 weeks to cure, no longer heats and looks dark and crumbly
- Curing affects to availability of nitrogen and the microbial activity of the compost
- Temperatures during curing 80-110 degrees
- With 2 compost piles one batch can cure while another batch is started

Using Compost

- Amending soil
  - Makes soil easier to work with
  - Creates better medium for plant growth
  - Mix 1-2 inches of compost into the soil before planting
- Mulching
  - Compost applied to the soil surface helps control weeds, conserves water and protects soil from erosion
  - Best time to apply is in early summer

Can a Compost Pile Catch Fire?

- Rare
- Only if very hot zone next to a dry zone
- Fires do not start in moist or small piles

Can I Use Manure in my Compost?

- Avoid fresh manure in piles that will be used for fresh garden crops
- Do not use dog, cat or pig manure

Compost and the Environment

- Reduce flow of wastes to landfills
- Produces valuable organic matter for the soil
- Backyard composting is a simple yet important way to improve communities and the environment!

Food

- Don’t dead head
  - Seeds and stems
- Set up bird feeders
  - Skip the wild bird mix
  - Single seed such as black oil sunflower seeds
- Insect eaters will find treasures in leaf litter
- Set out orange halves and peanut butter

Water

- Open water is needed
- Use heater
  - Electric
  - Solar
- Keep clean
- Change water often

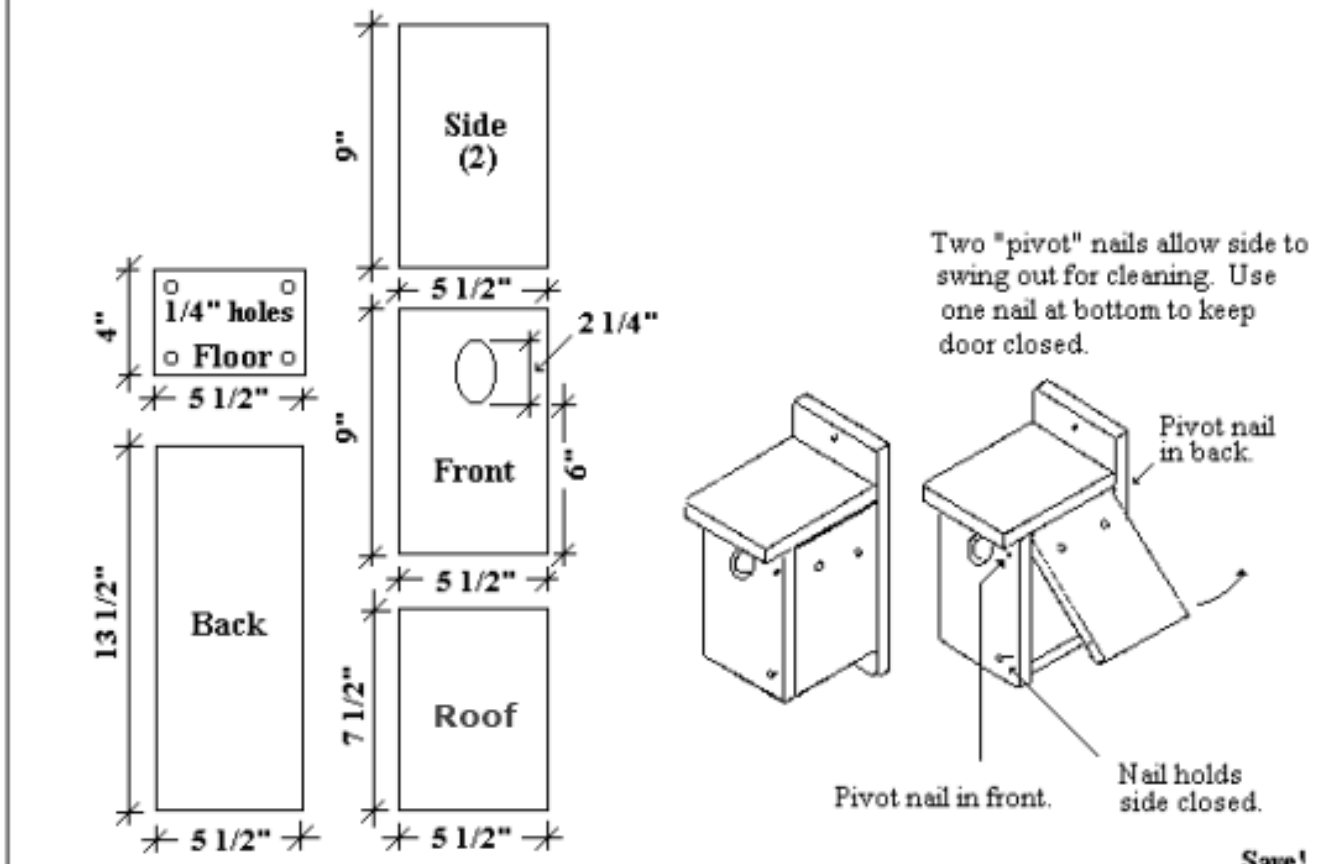
Provide Cover

- Layers
  - Trees
  - Shrubs
  - Evergreens
  - Berries
  - Crabapples

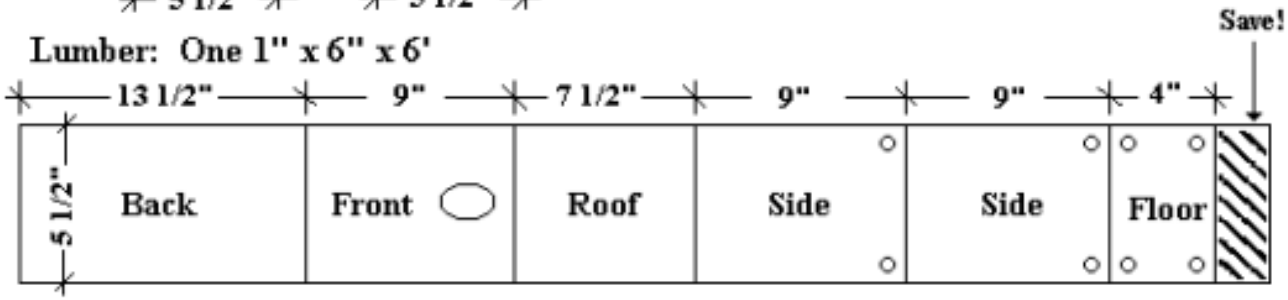
Conceder adding Houses

- Many plans on line, some using just one board
- www.birdwatching-bliss.com/support-files/bluebird-house-plans.pdf+
- www.nabluebirdsociety.org/PDF/Eastern%20-%20Western%20Bluebird%20Nestbox%20plans.pdf
- www.birdsandblooms.com/backyard-projects/diy-birdhouse/diy-birdhouse-bluebirds/

ONE-BOARD BOX



Lumber: One 1" x 6" x 6'



Fall Garden Maintenance

Clean up plant debris

- Remove spent vegetable plants
- Rake and dig out weeds
- Cut down asparagus tops (personal choice)
- Remove old foliage on strawberries
- Dig tubers
- Pull tender summer bloomers

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Fall Planting

- Plant spring flowering bulbs
- Plant new herbaceous perennials, including grasses
- Divide overcrowded perennials
- Plant hard-neck garlic

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Winterize Plants

- Apply mulch around sensitive plants
- Prune back blackberry & autumn raspberry canes
- Tie shoots of climbers & wall shrubs
- Wrap or cover tender shrubs
- Protect from animals

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Plant Cover crops

Legumes

- Alfalfa
- Field Peas
- Soybeans
- White clover

Grasses

- Annual ryegrass
- Barley
- Winter wheat

Advantages

•Prevent erosion
•Compete with weeds
•Provide organic material
•Add nutrients

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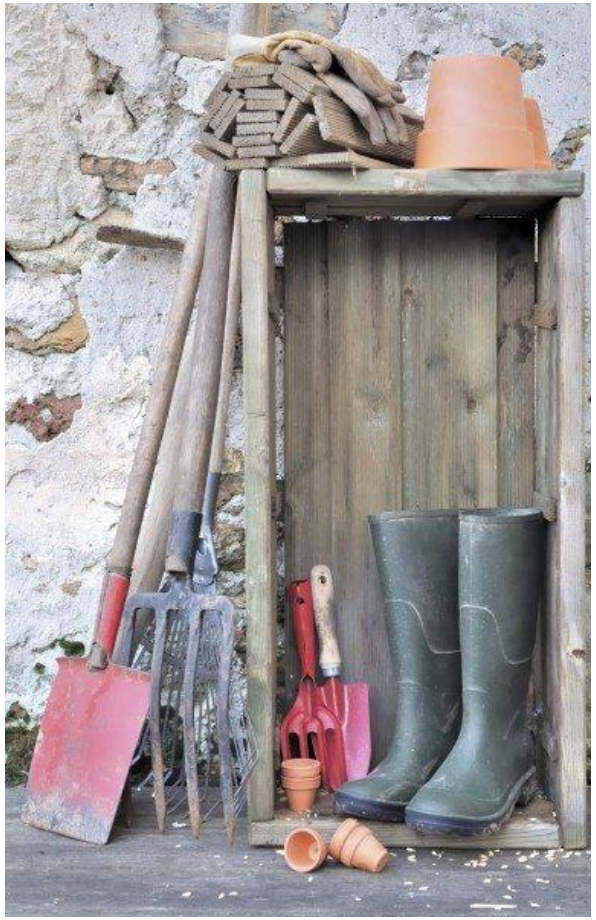
Clean garden tools

- Scrape off dirt with coarse metal brush
- Rub with damp, then dry rag
- Sand off any rust
- Wipe with oiled rag (vegetable oil)
- Sand off splinters on wood & wipe with linseed oil
- Store on a rack
- Drain any hoses & sprinklers; patch holes and store looped
- Wash & disinfect empty pots



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Start planning for next year

- Collect, label & store seeds
- Read your garden diary; analyze what worked well and what didn't
- Using your garden map, plan your crop rotation for next year; create a new map
- Collect newspapers for mulch and making pots

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Crop Rotation

- Change the planting location each season
- Reduces damage from insects
- Limits development of diseases
- Helps manage soil fertility

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Planning Rotation

- Base on vegetable crops you grow
- Don’t plant crops of same family in same location in succeeding years
- Keep a garden map yearly
- Have a 3 to 4 year rotation plan
- Plant cover crops/ green manures before or in place of vegetables (space allowing)

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Vegetable Families*

PLANT FAMILY	VEGETABLES
Carrot (Apiaceae)	Carrot, celery, parsley, parsnip
Goosefoot (Chenopodiaceae)	Beet, spinach, Swiss chard
Gourd (Cucurbitaceae)	Cucumber, muskmelon, pumpkin, squash, watermelon
Grass (Poaceae)	Ornamental corn, popcorn, sweet corn
Mallow (Malvaceae)	Okra
Mustard (Brassicaceae)	Broccoli, Brussels sprouts, cabbage, cauliflower, collard, kale, kohlrabi, mustard greens, radish, rutabaga, turniPS
Nightshade (Solanaceae)	Eggplant, pepper, potato, tomato
Onion (Alliaceae)	Chives, garlic, leek, onion
Pea (Fabaceae)	Beans, peas
Sunflower (Asteraceae)	Endive, lettuce, sunflower

***University of Wisconsin Extension Garden Facts (http://hort.uwex.edu)**

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Questions?