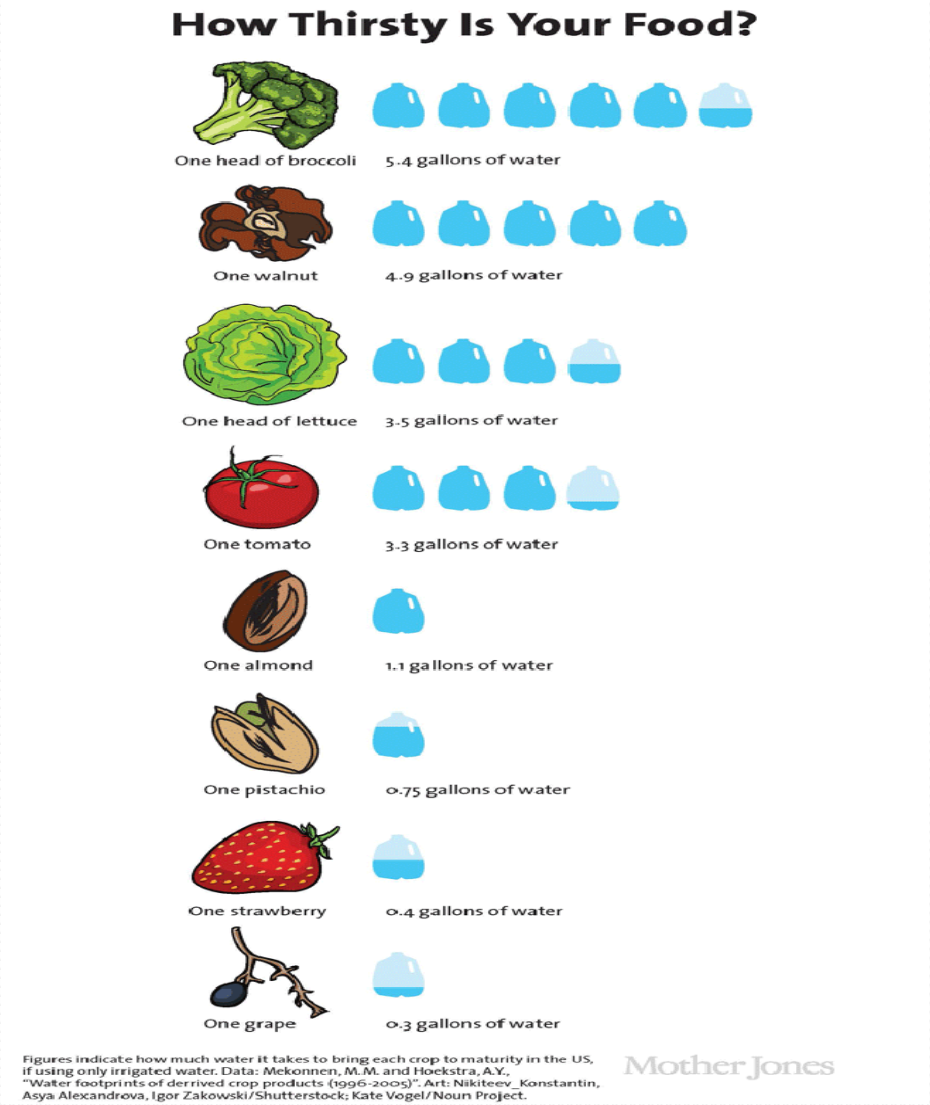
GROWING FOOD IN A DRY CLIMATE

- PLAN YOUR GARDEN
- SOIL/BED PREPARATION
- VEGETABLE CHOICES
- PLANTING & WATERING CONSIDERATIONS
- PLANT TRAINING & INTERVENTIONS
- WATERING ROUTINE VARIATIONS
- ALTERNATIVES: STRAW BALE/KEYHOLE GARDENS

Commercial Production



PLANNING THE GARDEN

- Close to water supply
- Raised beds
- Bed design—size matters
- Orientation of beds—east/west
- Take it easy—don't create more work than you can handle

Cinder Block Raised Bed Garden

Soil/Bed Preparation

Good-quality garden soil:

- Contains nutrients essential for plant growth.
- Holds on to moisture but drains well.
- Allows for air movement.

VEGETABLE CHOICES: drought hardy

- Rhubarb-once mature is drought resistant
- Swiss Chard
- ‘Hopi Pink' corn
- Asparagus-once established
- Jerusalem artichoke
- Legumes: Chickpea, Tepary beans, Moth bean, Cowpea, 'Jackson Wonder' lima bean; also, pole beans and bush beans
- Green Striped Cushaw squash
- 'Iroquois' cantaloupe
- Okra
- Peppers
- Armenian cucumber
- Amaranth-green leafed varieties
- 'Pineapple' tomato
- Chiltepines-wild chiles
- Dark Star Zucchini
- Most woody herbs, e.g., lavender, thyme, rosemary & sage

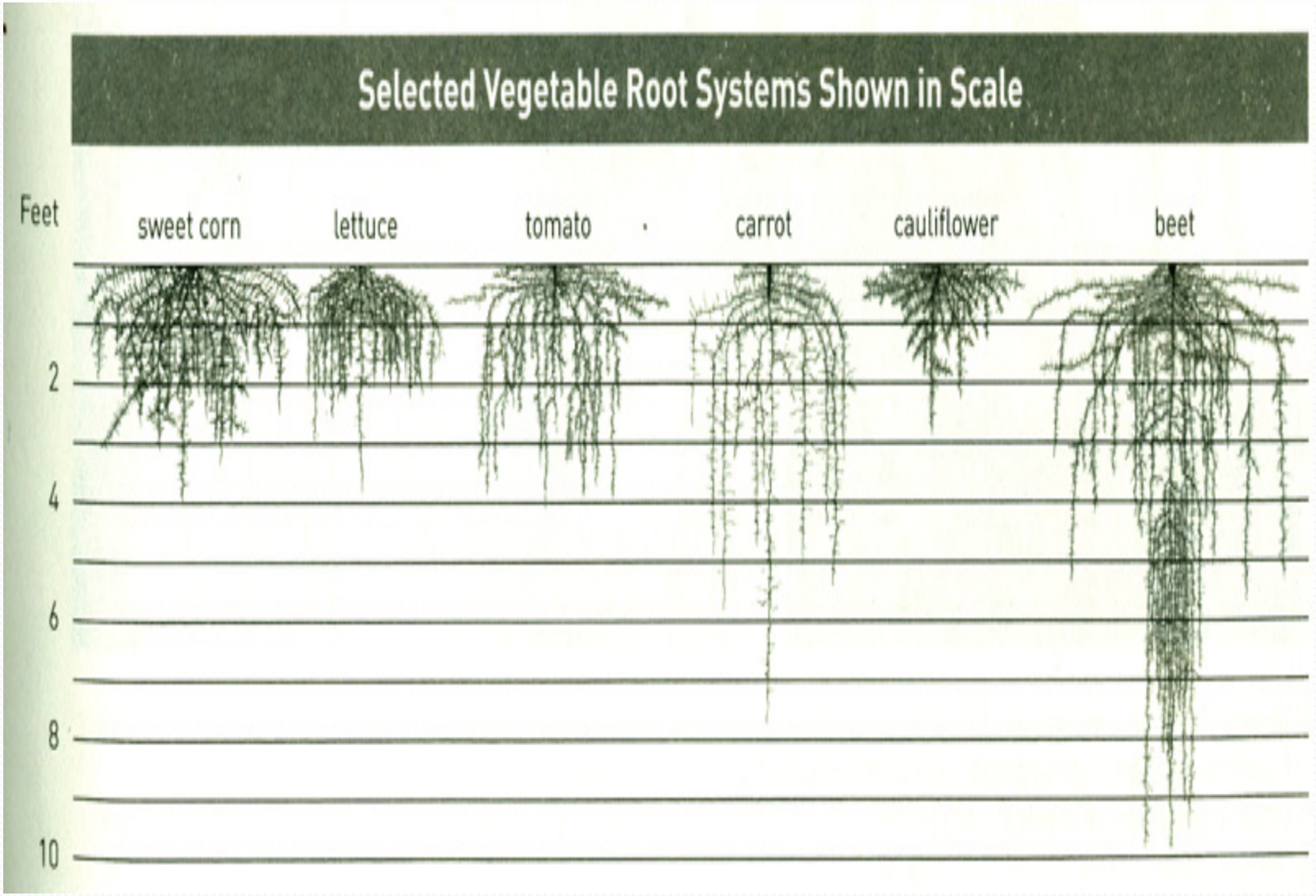
Vegetables needing consideration

Grow during cooler weather (spring/fall)

- Brussels Sprouts
- Collards
- Cauliflower
- Cabbage
- Broccoli
- Soybeans
- Peas
- Lettuce/spinach
- Kale
- Certain root crops

PLANTING AND WATERING CONSIDERATIONS

- Most plants can get by on 1/10th to 1/20th of the water we give them!
- Group plants by water needs
- Don't plant in traditional rows—use plants to shade each other
- Plant closer together
- Water deeply, but seldom
- Consider root zones & target water there
- Many plant roots can be trained up to 4 feet deep
- Each 1" of water penetrates 6" of soil


Selected Vegetable Root Systems Shown in Scale
Feet
sweet corn
lettuce
tomato
carrot
cauliflower
beet
2
4
6
8
10

WATERING ROUTINE VARIATIONS

- Length of daylight determines water needs, not necessarily temperature
- By mid-August, garden needs less water—perhaps ½ the water it did in June
- By August 15th, a garden needing 3 inches of water per week previously might need only 1.5 inches
- Yes it is hotter, but because of the angle of the sun & duration of light hours per day, less water is needed
- Avoid evaporation—water early am or evenings

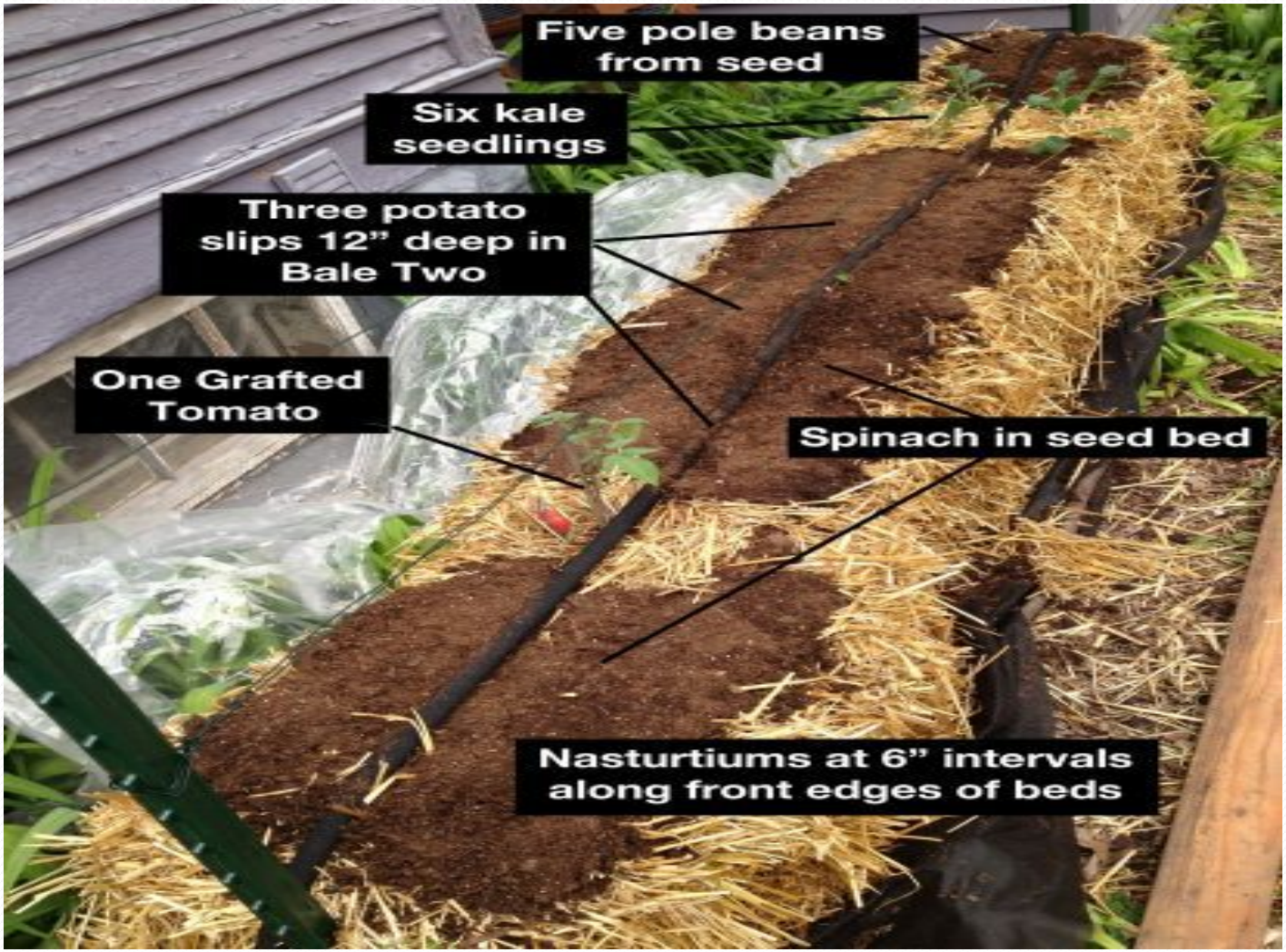
ALTERNATIVE: STRAW BALE GARDENS

Cabbage Patch

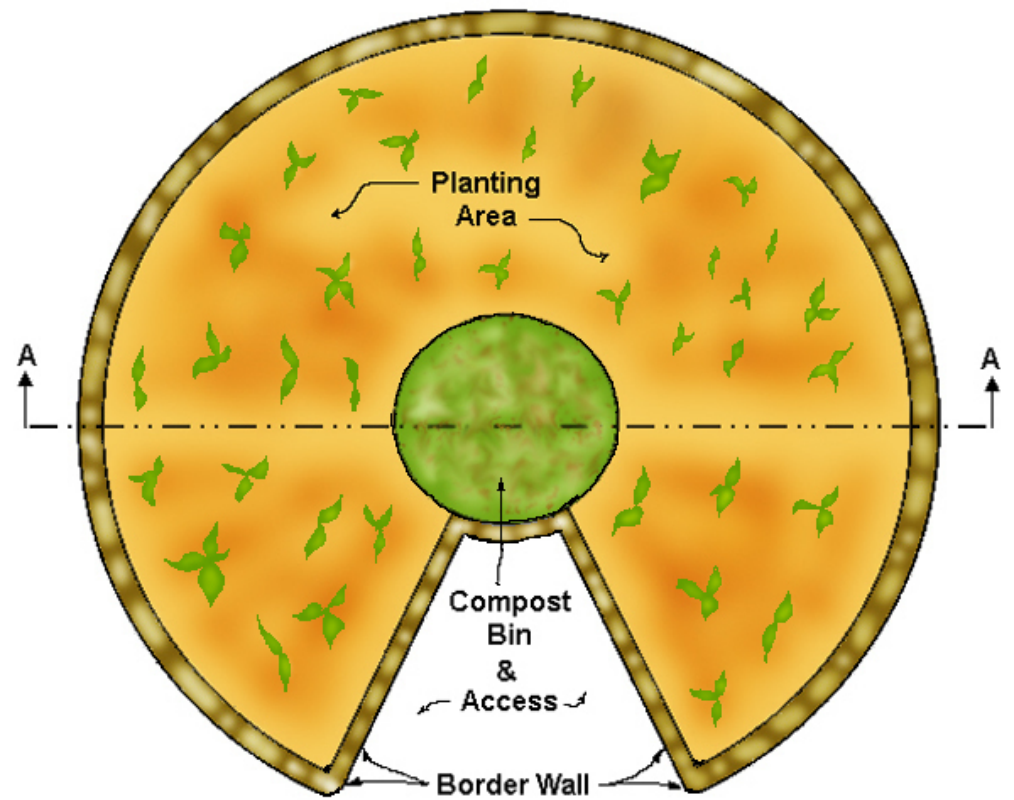
Benefits

- Conserves water
- No digging
- No building
- Bale itself works as own compost/growing medium
- Inexpensive
- Leaves gardener with excellent compost for next year's garden

Planting the Straw Bale



ALTERNATIVE: KEYHOLE GARDENS



Keyhole Garden Plan View

KEYHOLE GARDEN

Benefits

- Center compost—steady nutrients and amendments
- Uses less water; drought-tolerance
- Garden can be modified; higher for access
- Gardens require only a maximum of 6-1/2' diameter
- Recycled material used; inexpensive
- Handy center compost basket for kitchen waste
- Temporary or permanent

This ‘n That

- Plant what you will eat
- Bury tomatoes sideways and/or deep
- Use Heirloom varieties for plants/seeds
- Plant flowers along with veggies for pollinators
- Let some healthy plants go to seed
- Treat soil as a living entity
- Be kind to the worms
- Honor all life in the garden, including wasps
- Adapt your gardening decisions to the available water
- Enjoy your time in the garden

PERMACULTURE

- Uses what is available; renewable & redundant; promotes self-sufficiency and lessens dependency
- Produces no waste
- Catches and stores energy (resources); saves water
- Uses small and slow solutions
- Produces a yield
- Mimics nature; supports all life; integrated design
- Non-invasive; follows patterns of and enhances natural environment
- Creatively responds to change

12 Permaculture design principles articulated by David Holmgren in his *Permaculture: Principles and Pathways Beyond Sustainability*:

- *Observe and interact*: By taking time to engage with nature we can design solutions that suit our particular situation.
- *Catch and store energy*: By developing systems that collect resources at peak abundance, we can use them in times of need.
- *Obtain a yield*: Ensure that you are getting truly useful rewards as part of the work that you are doing.
- *Apply self-regulation and accept feedback*: We need to discourage inappropriate activity to ensure that systems can continue to function well.
- *Use and value renewable resources and services*: Make the best use of nature's abundance to reduce our consumptive behavior and dependence on non-renewable resources.
- *Produce no waste*: By valuing and making use of all the resources that are available to us, nothing goes to waste.
- *Design from patterns to details*: By stepping back, we can observe patterns in nature and society. These can form the backbone of our designs, with the details filled in as we go.
- *Integrate rather than segregate*: By putting the right things in the right place, relationships develop between those things and they work together to support each other.
- *Use small and slow solutions*: Small and slow systems are easier to maintain than big ones, making better use of local resources and producing more sustainable outcomes.
- *Use and value diversity*: Diversity reduces vulnerability to a variety of threats and takes advantage of the unique nature of the environment in which it resides.
- *Use edges and value the marginal*: The interface between things is where the most interesting events take place. These are often the most valuable, diverse and productive elements in the system.
- *Creatively use and respond to change*: We can have a positive impact on inevitable change by carefully observing, and then intervening at the right time.

Resources for More Info

- California's Water collapse: http://www.feelguide.com/2015/03/22/r-i-p-california-1850-2016-what-well-lose-and-learn-from-the-worlds-first-major-water-collapse/#!prettyPhoto
- Straw Bale DIY: http://modernfarmer.com/2013/07/straw-bale-gardening/
- More on Straw Bales: http://cru.cahe.wsu.edu/CEPublications/FS109E/FS109E.pdf
- Keyhole garden:
- http://davesgarden.com/guides/articles/view/3726/#ixzz3W6dgLMw7
- 5 Tips: http://www.treehugger.com/lawn-garden/how-to-have-bountiful-water-saving-garden-time-drought.html
- Drought-tolerant crops: http://www.bountifulgardens.org/Vegetables/products/346/
- More of the same: http://www.harvesttotable.com/2009/07/drought_tolerant_vegetables/