

# UF/IFAS Extension

## The Journey to Sustainability Begins with Education





# **Organic Vegetable Gardening Transplants**

**Noontime Talks  
Phillippi Farmhouse Market**

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UF/IFAS Sarasota County Extension**

# OUTLINE

- Overview of topics of noontime talks on organic vegetable gardening
- Introduction to organic vegetable gardening
- Basics of transplants: growing and planting

# Topics of Noontime Talks for Organic Vegetable Gardening

- Introduction (Nov 23, 2011)
- Edible Flowers (Dec 7, 2011)
- Container Gardening (Dec 21, 2011)
- Worm Composting (Jan 4, 2012)
- Frost Protection (Jan 11, 2012)
- Composting – Part 1 (Jan 25, 2012)
- Transplants (Feb 8, 2012) ←

# Topics of Noontime Talks for Organic Vegetable Gardening

- Composting – Part 2 (Feb 22, 2012)
- Irrigation (March 14, 2012)
- Beneficial Insects (March 28, 2012)
- Companion Planting (April 11, 2012)
- Cover crops (April 22, 2012)

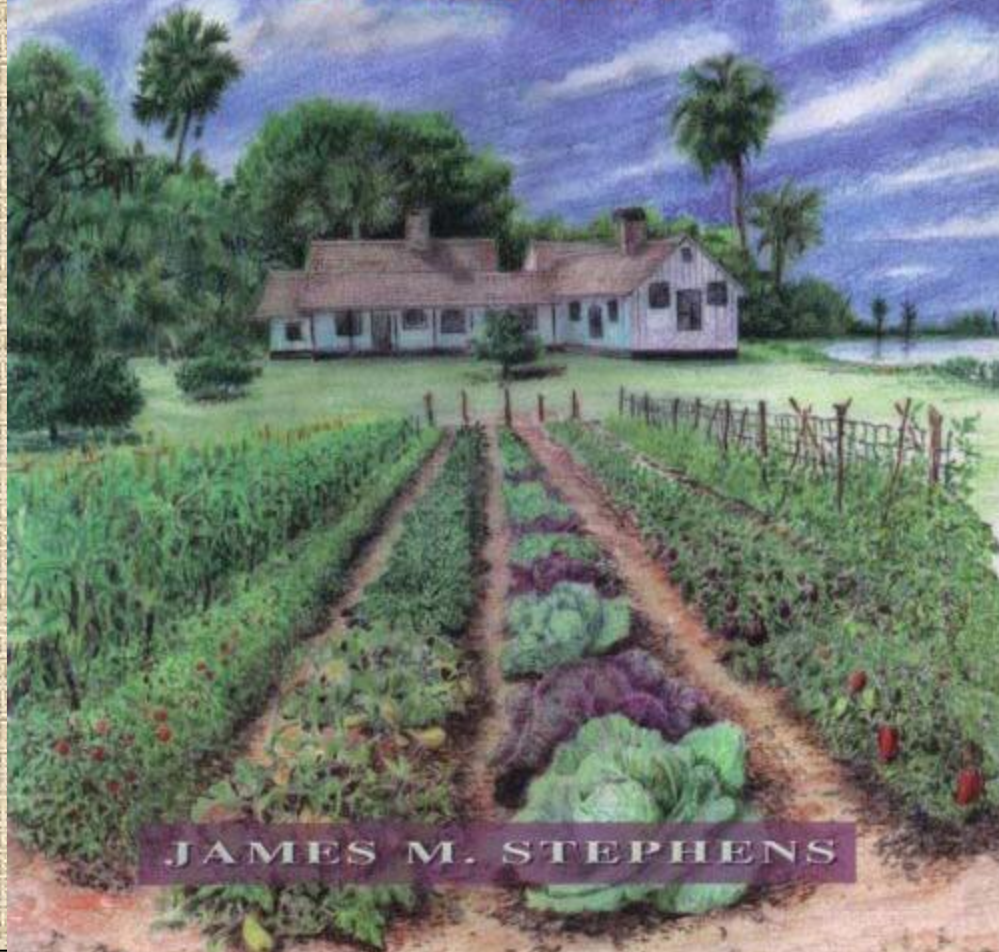
# Goals for Noontime Talks on Organic Vegetable Gardening

- Food for your freshest nutrition
- Food for expanding benefits of backyard vegetable gardening
- Food for thought
- Food for your soul

# Approach of Noontime Talks on Organic Vegetable Gardening

- Promote the practice of the guidelines in the reference “Vegetable Gardening in Florida” by James M. Stephens. 1999. Univ. of FL, IFAS
- Provide background information on the science and principles from agroecology for successful organic vegetable gardening
- Provide additional resources available for successful organic vegetable gardening

# VEGETABLE GARDENING IN FLORIDA



JAMES M. STEPHENS

- Available from UF/IFAS bookstore, see <http://ifasbooks.ufl.edu/merchant2/>  
Also available from your favorite book vender.



# What is Agroecology?

- Recognition of the whole systems nature of food production
- Indicators of agroecosystem sustainability
  - Energy flow
  - Nutrient cycling
  - Population regulation mechanisms
  - Dynamic equilibrium
- Application and management
  - Identify the indicators in each system
  - Observe immediate and future impacts
  - Focus the search for alternatives or solutions to problems

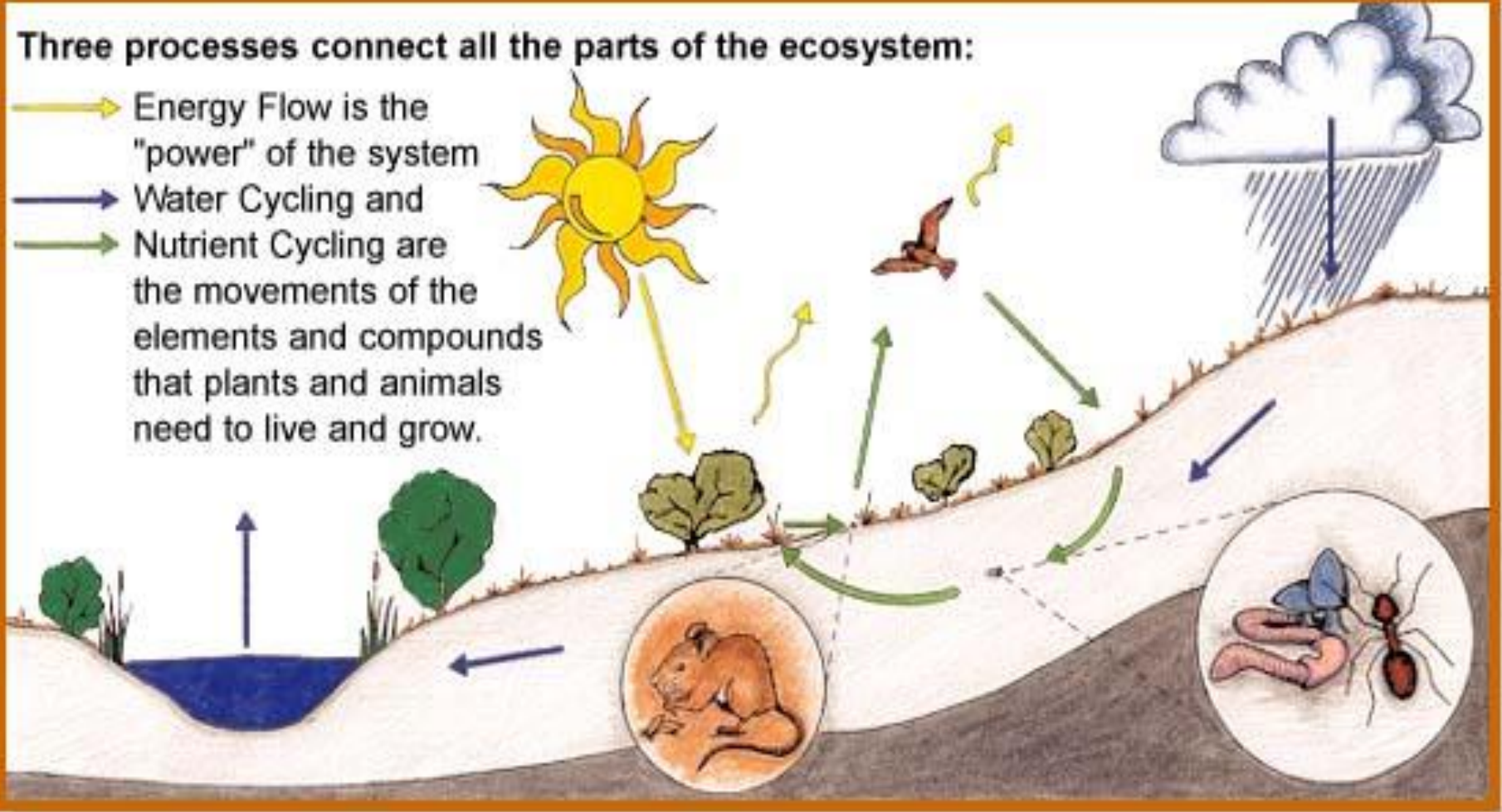
# Ecosystems and Plant Growth

## ECOSYSTEM PROCESSES

ILLUSTRATION: NICOLE BRAND

Three processes connect all the parts of the ecosystem:

- Energy Flow is the "power" of the system
- Water Cycling and
- Nutrient Cycling are the movements of the elements and compounds that plants and animals need to live and grow.

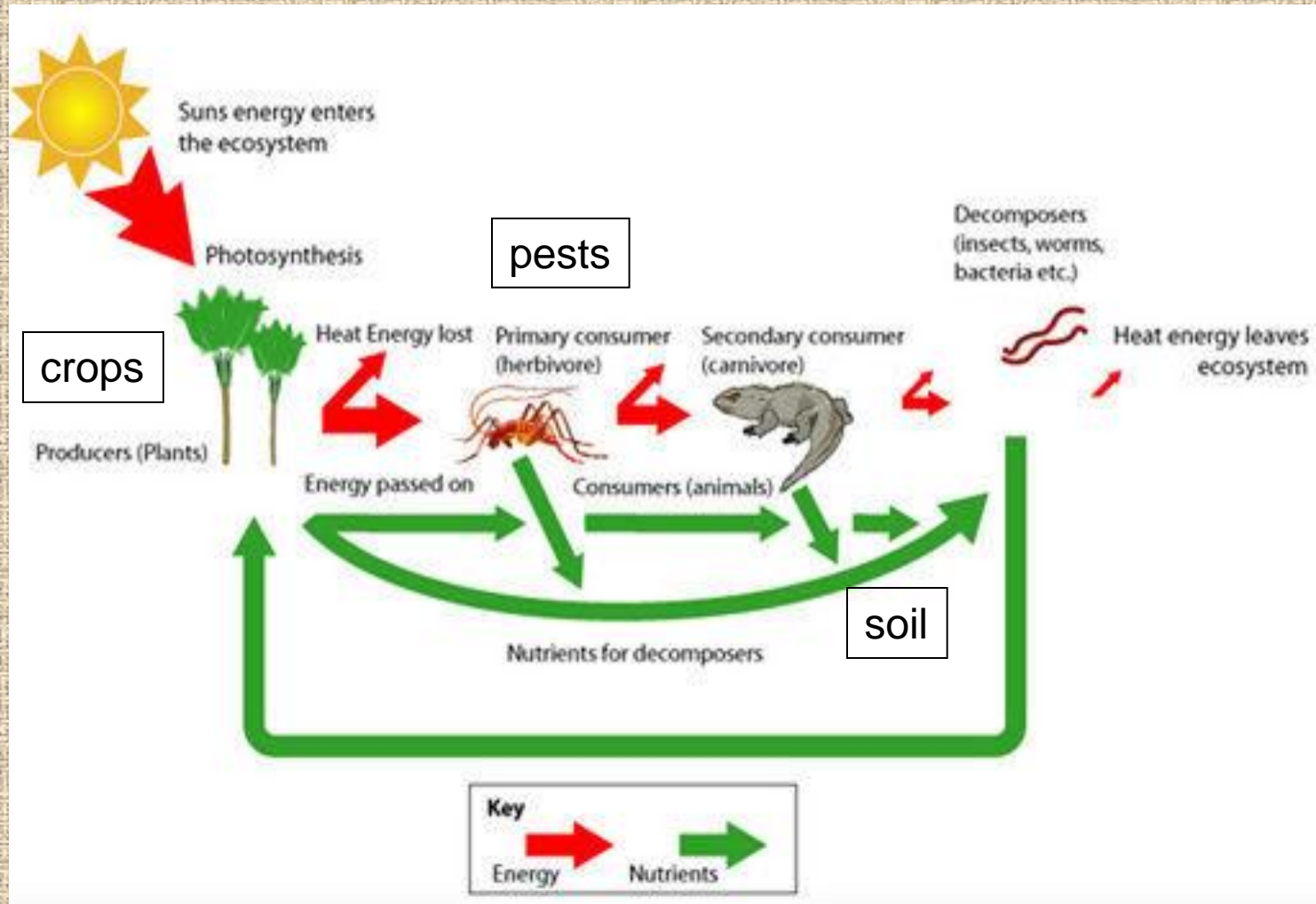


- Our model is the “ecosystem” w/ functional emergent properties & subsystems (e.g., nutrient cycling, etc)

# How to Understand a Successful Organic Vegetable Garden Ecosystem

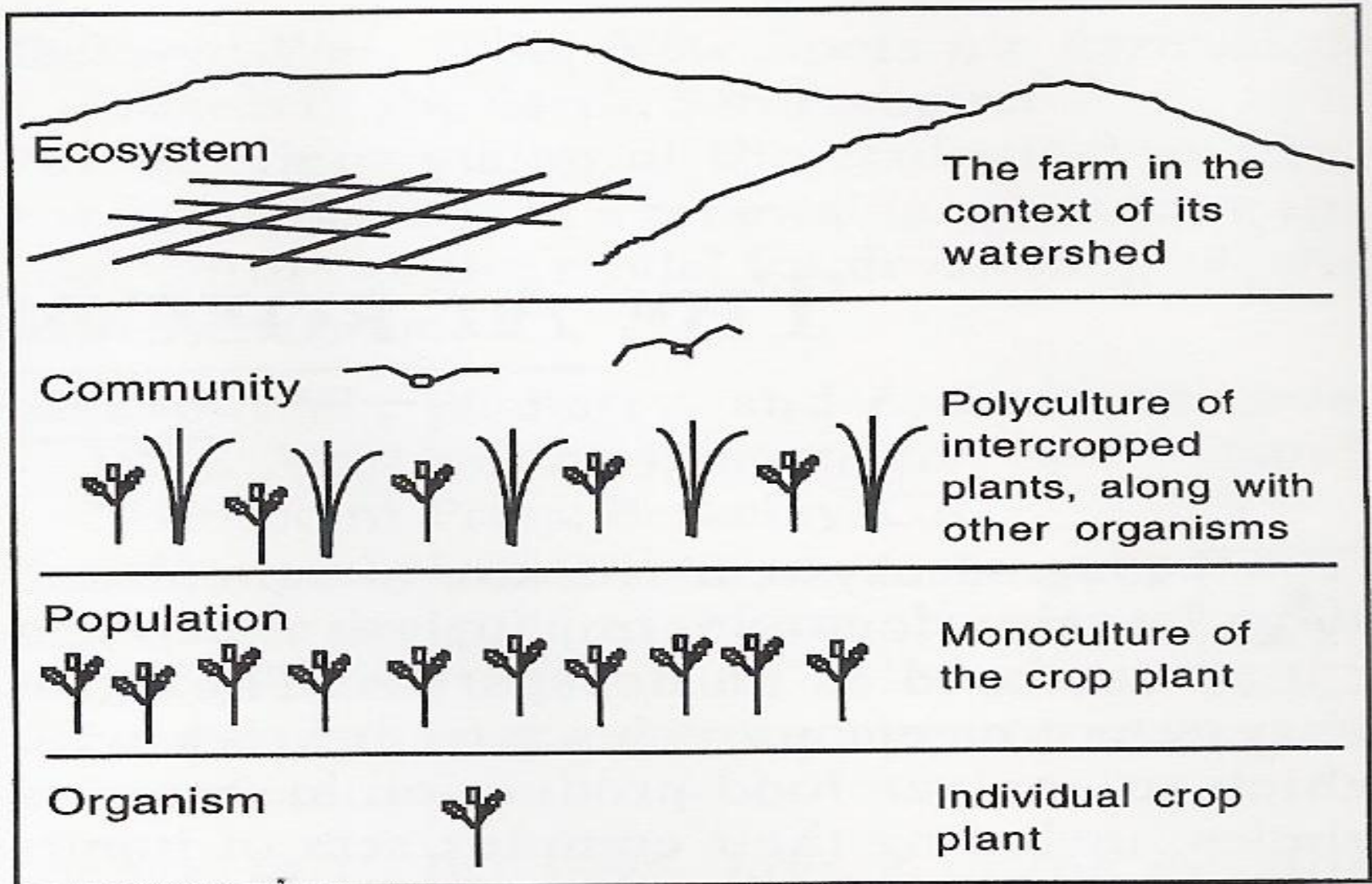


# Organic Vegetable Garden Ecology



- Our model for organic vegetable gardening too is promote the “ecosystem” with functional subsystems from managed biodiversity

# Garden As An Agroecosystem



Hierarchical Scale & Emergent Properties

# What Is Organic Vegetable Gardening?



# Organic Vegetable Gardening

- A science and art
- Incorporates the entire landscape design and environment to improve and maximize the garden soil's health, structure, & texture
- Maximizes the production and health of developing plants without using synthetic commercial fertilizers, pesticides, or fungicides

David Knauft, Horticulture Department, Univ. of GA

[www.caes.uga.edu/extension/clarke/anr/documents/Organicgardening.pdf](http://www.caes.uga.edu/extension/clarke/anr/documents/Organicgardening.pdf)

# Organic Vegetable Gardening

- Differences to "conventional" gardening
  - mainly in the areas of fertilization and pest control
  - use natural and organic materials and methods
  - avoids using practices and synthetic chemicals that may be detrimental to his health or environment.

James Stephens, Horticultural Sciences Department, IFAS, Univ. of FL  
<http://edis.ifas.ufl.edu/VH019>



# Transplants: Basics

- ✓ Pro and Con
- ✓ Growing media
- ✓ Growing conditions
- ✓ Transplanting



# Transplants: Basics

## What To Look For In Transplants:

- ✓ Short plants are desirable , i.e. not leggy plants with well developed roots.
- ✓ Appropriate stage of growth is the four- to six-leaf stage for most vegetable transplants.
- ✓ Stocky plants are favorable because they are most likely to withstand the outside environment.
- ✓ Dark green coloration is an indicator that the transplant has adequate fertility.
- ✓ Pest free.

<http://extension.missouri.edu/news/DisplayStory.aspx?N=1087>

# Transplants: Basics

Which Transplant Is Better ?:



Poor

Better

Note: long internodes, a spindly stem and a lighter green color

# Transplants: Pro and Con

- ✓ Seeds are not wasted because seeds growing in a greenhouse environment have a higher germination rate than those growing in the field where various environmental factors can lead to low survival rates.
- ✓ When transplants are planted in the field, they are likely to be more uniform since they start off in the field at the same growing stage. Harvesting times are reduced because the plants will likely ripen at the same time.
- The harvesting season is longer because transplants yield earlier harvests. This is good news for growers who wish to grow warm-season crops in cooler climates.
- Plants get a “head start” in the greenhouse when it is too cold to plant outside. They will be ready to plant when the weather is ideal, and the crop will be ready to sell or eat earlier than usual.

# Transplants: Pro and Con

- ✓ Running a greenhouse involves additional expenses.
- ✓ Additional expertise and time are needed to coordinate sowing dates with planting dates in the field.
- ✓ Transporting bulky flats or cell packs between the greenhouse and the field requires more work.

<http://anr.ext.wvu.edu/r/download/51444>

# Transplants: Growing Media

- ✓ Various mixes can be used – both commercial & homemade
- ✓ Condition of the media is important when considering containerized production.
- ✓ Soilless mixes with bark or peat moss with twigs contain large elements that permit gaps in the cell (i.e.; incomplete filling), they are not appropriate for small-cell vegetable transplant production



# Transplants: Growing Container

- ✓ Cell size general recommendations:
  - larger cells are recommended for longer cycle vegetable transplants (>5 weeks) such as peppers and tomato
  - smaller cells may be the better choice for shortcrops (<4 weeks). In short crops, root growth may not completely fill a large cell, and damage may occur when "pulling," as soil falls away and exposes roots.

<http://edis.ifas.ufl.edu/hs126>

# Transplants: Growing Container

✓ Transplant containers come in many different tray materials and sizes



Plastic, Jumbo Size



Styrofoam in various cell sizes



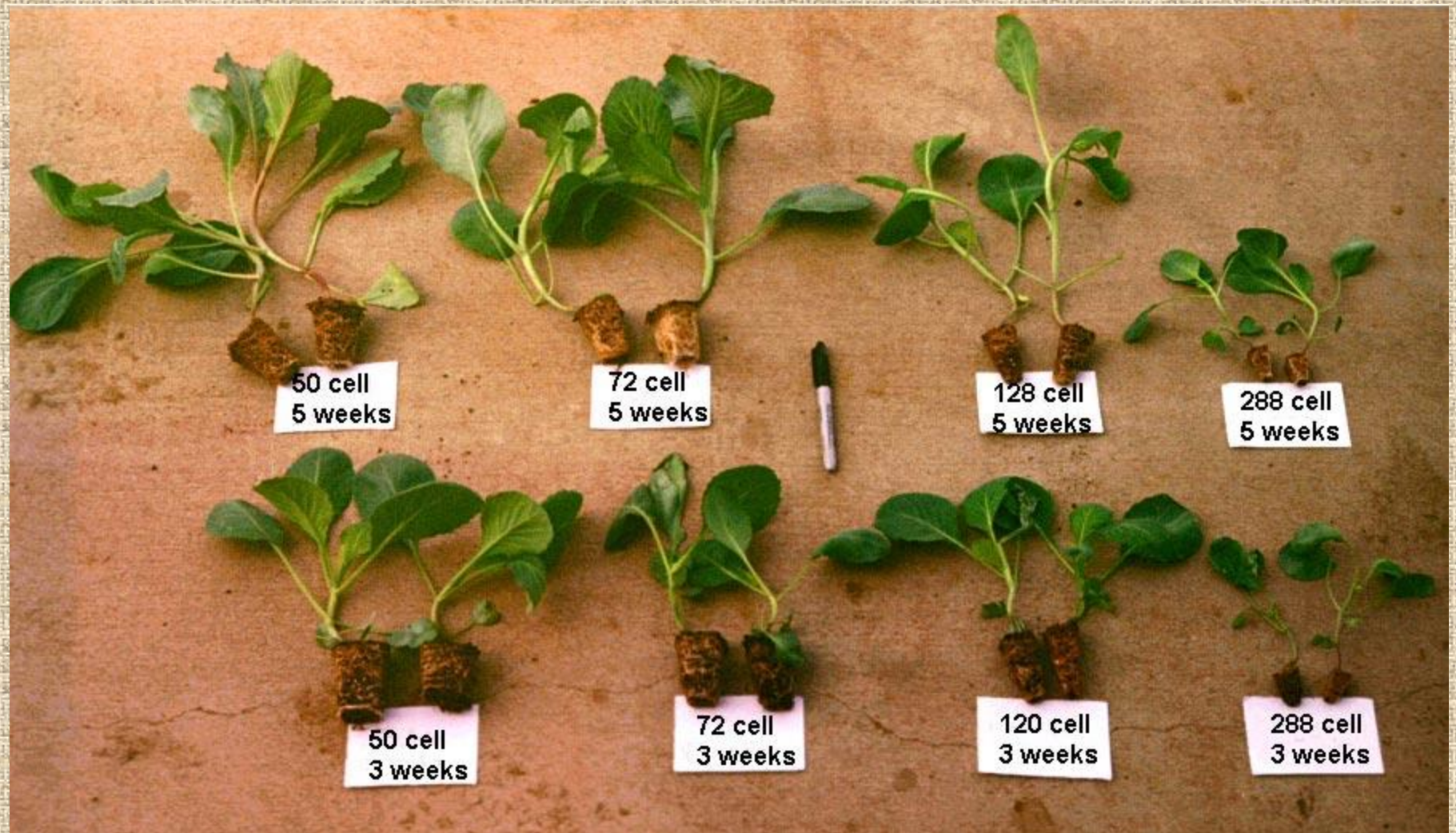
Peat Pellets



Plastic, Mid to Large Sizes



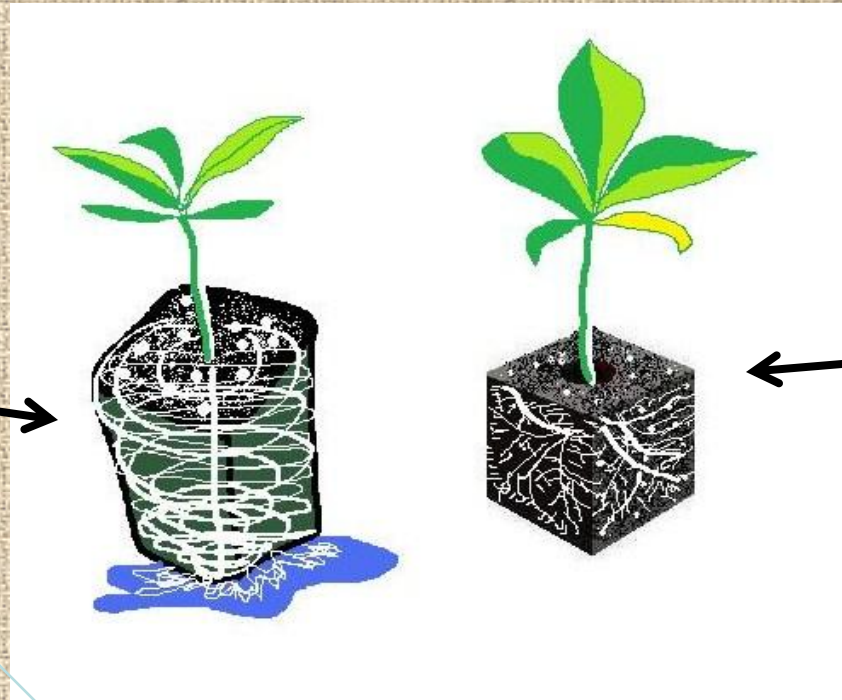
# Growing Time and Cell Size Impact on Cabbage Transplants



# Transplants: Soil Blocks

✓ A new “old” idea that mimics garden soil

Plastic pots reduce air flow and cause rootbound transplants



Air pruned block does not limit oxygen To roots

[http://www.pottingblocks.com/eliot\\_coleman\\_soil\\_blocks.html](http://www.pottingblocks.com/eliot_coleman_soil_blocks.html)

# Transplants: Growing Conditions

- ✓ The "ideal" technique for growing transplants would be to raise the plant from start to finish by slow, steady, uninterrupted growth and with minimal stress.
- ✓ Since ideal growing conditions rarely exist, plant growth may need to be controlled through the manipulation of water, temperature, and nutrients.

# Transplants: Propagation House



**Minature Propagation Houses**



**Larger Propagation Houses**

# Transplants: Growing Conditions

Temperature: see handout for optimal seed germination temperatures



Transplant Germination Trays with Heating Pads

# Transplants: Growing Steps

- ✓ Use good seed
- ✓ Make soilless mixture. See handout for recommendation from Cornell Univ. organic research
- ✓ The planting mixture can be wet or dry when filling the trays, but should be lightly pressed into each cell, to ensure even distribution and no air pockets
- ✓ Plant seeds at normal depths or a little shallower.
- ✓ When watering trays, make sure that they receive the proper amount.



<http://www.groworganic.com/media/pdfs/gp001-l.pdf>

# Transplants: Growing Steps

- ✓ Irrigation frequency will depend on your planting mix, the time of year, air temperature, sun intensity, and wind
- ✓ Following development of true leaves, you may use 1-2 Tbs. of fish emulsion per gallon of water every irrigation.
- ✓ Grow plants in cells until they can be easily removed by gently pulling on the plant stem. All of the planting mix should come out, with the roots, leaving a clean cell. If it doesn't, the plants have not grown long enough.

<http://www.groworganic.com/media/pdfs/gp001-l.pdf>

# Transplants: Transplanting

- ✓ Place entire root ball into soil
- ✓ Firm root ball into ground
- ✓ Water
- ✓ Mulch





# Transplants: Transplanting



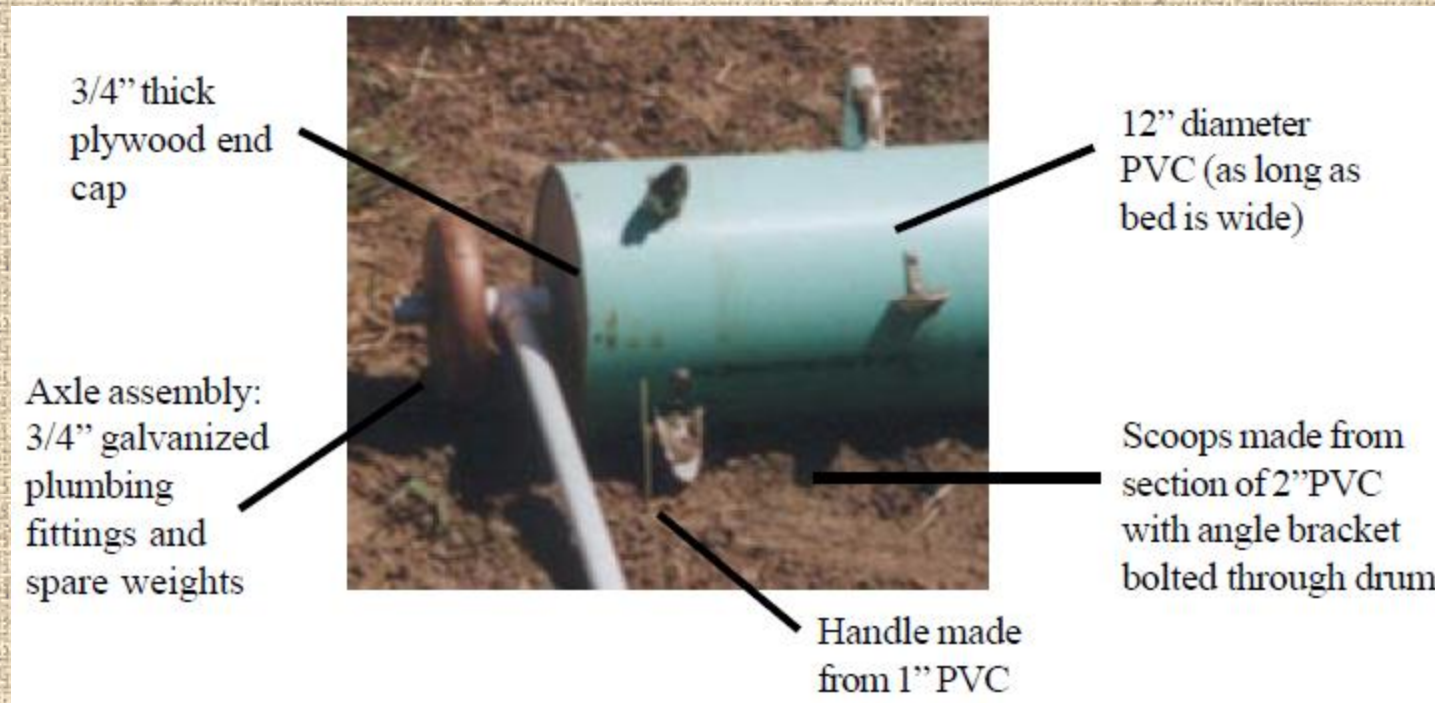
**Rolling Dibble Marker  
For Easy Transplant Spacing**



**Transplanting Into Dibble Holes**

# Transplants: Transplanting

## Homemade Dibble Marker Materials:



[http://bse.wisc.edu/hfhp/tipsheets\\_pdf/dibble4web.pdf](http://bse.wisc.edu/hfhp/tipsheets_pdf/dibble4web.pdf)

# THANK YOU

