Care of Transplants in the Field

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Not All Vegetables Transplant Well

- Plants difficult or not to transplant include:
  - Root crops (carrots, beets)
  - Leafy biennial herbs (dill)
  - Heading types of Chinese cabbage
  - Cucurbits (cucumbers, pumpkins, squash)
    - Do not like their root systems disturbed
  - Vegetables growing quickly when seeded in the garden (radish, leaf lettuce, spinach)
    - Transplanting is not worth the effort

Ease of Transplants

Relative difficulty in transplanting various vegetables		
Easy to transplant	Medium difficulty	Difficult to transplant
broccoli	cauliflower	cucumber
brussels sprouts	celery	muskmelon
cabbage	eggplant	squash
lettuce	onion	watermelon
tomato	pepper	

Vegetables Traditionally Transplanted

- Small seed vegetables
  - Tomatoes, peppers, head lettuce, broccoli
- Some vegetables are traditionally started from transplants because they do not produce seed or the seed lacks vigor
  - Sweet potato, Irish potato

Planting Dates (cont.)

- Warm season crops
  - Tender warm season crops April 15
    - beans, sweet corn, tomatoes
  - Very tender warm season crops May 10
    - okra, cantaloupe, super-sweet corn
      - Soil temperature needs to be near 70 degrees.
- Some crops grow best in the fall
  - Ex.- broccoli, collards

Age affects production

- Smaller, stocky plants that have not started to bloom and/or set fruit will adapt to the garden more easily than leggy transplants that already have small fruits hanging on them.
- Tomato plants 4-5 weeks old grow and yield better than older transplants.

Best Size – 6 “ tall and 6” wide

Too Leggy

Hardening-off Transplants

- *Definition:* Hardening-off is the process whereby transplants stop growth and develop greater tolerance to the weather so they can survive being planted into the garden
- Is critical for both commercially grown transplants and transplants that you grow on your own

Hardening-off Transplants

- Hardening-off causes:
  - A slowing of growth
  - Greater cuticle thickness and waxes on leaves
  - Build-up of sugars
- Ways to harden-off transplants
  - Only water the transplants when they start wilting
  - Stop fertilizing
  - Expose transplants to cool temperatures and/or higher levels of sunlight

Bacterial Spot Control

- Use disease free transplants
- Avoid overhead irrigation
- If bacterial spot develops, apply a copper-based fungicide with maneb or mancozeb

Characteristics of drip irrigation

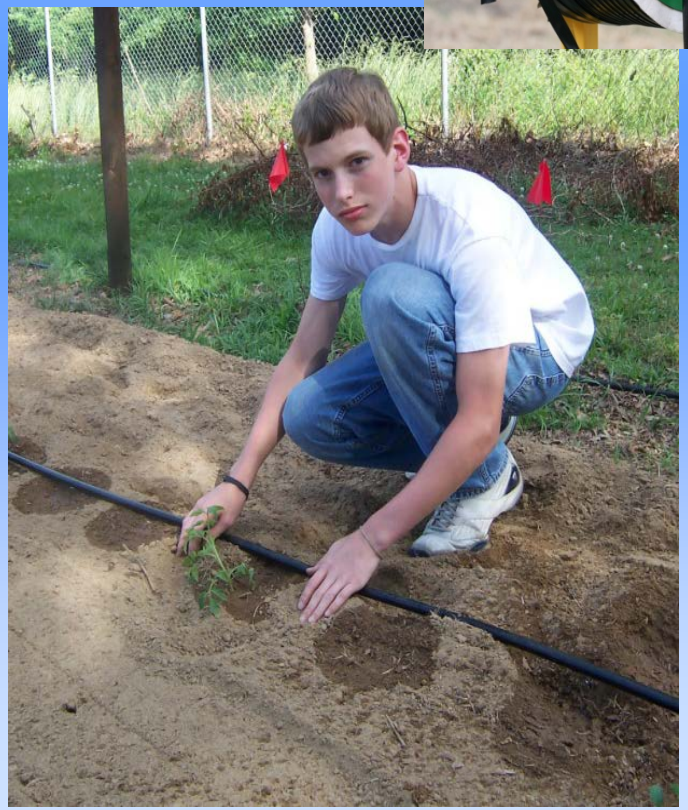
- Water applied to the soil near the plant at low flows
- Application is over longer periods of time than conventional irrigation
- Only the root zone is irrigated
- Applications are more frequent to maintain the proper moisture level in the root zone.

Some Advantages of Drip

- Increased crop yield.
- Higher quality crop.
- Less water and energy consumption.
- Less fertilizer and chemical usage.
- Reduced leaching and runoff.
- Field operations can go on while irrigating.
- Less foliar disease potential
- Using Drip may allow you to irrigate where you could not, with conventional

Drip tape

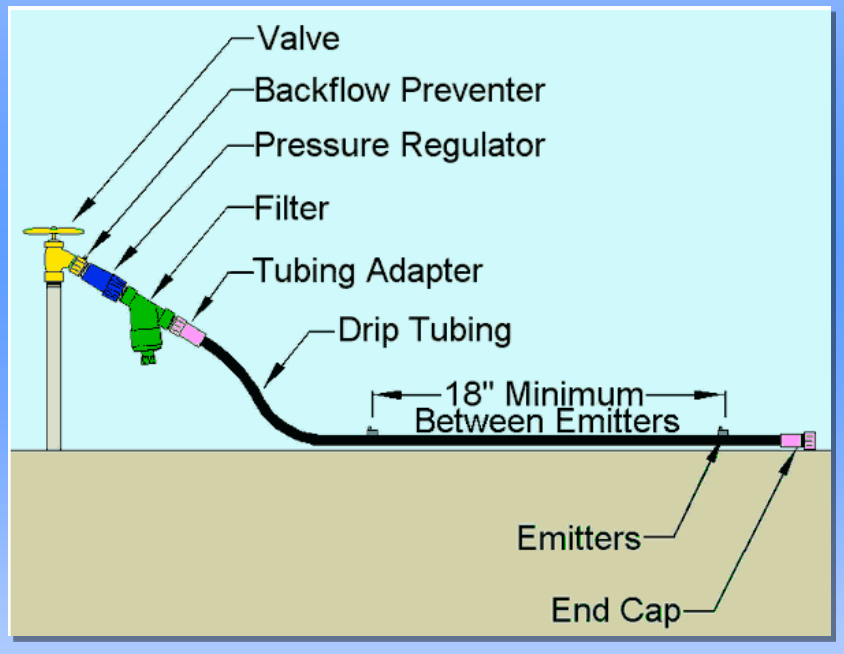
- Comes in rolls of several thousand feet
- Comes in different thicknesses (4-15 mill)
- Has built in emitters at set intervals (4” – 24”)
- Operates on low pressure (6-15 psi)
- Flow rates vary (.22 to .45 gpm/100’ on 12”)



Drip Irrigation

Connecting to the Water Source

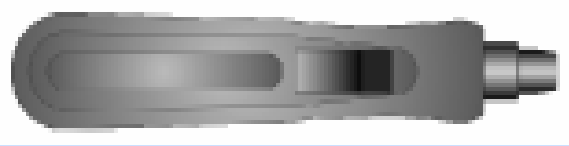
Connect to an Above or Underground Supply



Installation with an In-Line Valve.

Emitters for orchard crops

- Inline or punch-in
- Output measured in GPH.
- Usually .5 to 2gph
- Emitters can be added as orchard matures



fertigation

- The application of a portion of the fertilizer requirements of a crop through drip irrigation

Fertigation Basics

- 30-50% of the Nitrogen and Potassium is applied preplant, based on soil test and crop recommendations.
- All of Phosphorous and micronutrients are applied preplant.
- Remaining portion of Nitrogen and Potassium are applied during normal drip irrigation practices .

Nitrogen Sources

- Calcium Nitrate
  - 15% N, 15.5% Ca
  - Use greenhouse grade
- Potassium Nitrate
  - 13.75% N, 46% K
  - Use greenhouse grade
- Various water soluble fertilizers
  - 20% N, 20% P, 20%K

Annual Hill Plasticulture

Row cover uses

1. Additional late fall crown development
2. Mid-winter hard freeze protection
3. Frost/freeze protection
4. Promote earlier harvest

Windbreaks

Cool season small grains planted as temporary shields from wind.

As the vegetable crop grows, the cool season crop starts to die down.

10 Insects that cause damage in vegetables

- Aphids
- Colorado Potato Beetle
- Corn Earworm
- Cucumber Beetle
- Japanese Beetle
- Spider Mites
- Squash Vine Borers
- Thrips
- Cabbageworms, diamondback moths
- Stink bugs, squash bugs

Diseases with Insect Vectors

- Tomato Spotted Wilt Virus
- Bacterial wilt of Cucurbits
- Cucumber Mosaic Virus on Tomatoes and Cucurbits
- Thrips
- Cucumber beetles
- Aphids

Tomato Spotted Wilt Virus

Cucumber

Striped Cucumber Beetle

Spotted Cucumber Beetle

Whiteflies and Aphids

Spider Mites

Cultural Practices for Insect and Mite Control

- Keep winter broadleaf weeds out of field and borders.