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New Jersey Agricultural Experiment Station

Water Conservation

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Best Practices: Watering

- Smart Irrigation Technologies
  - Rain sensors
  - Smart irrigation systems

EPA WaterSense

- Weather-based irrigation controllers can reduce water use by 20% compared to conventional equipment

- Potentially saving more than 24 billion gallons per year across the United States—approximately equal to more than 7,000 hoses running non-stop for a full year.

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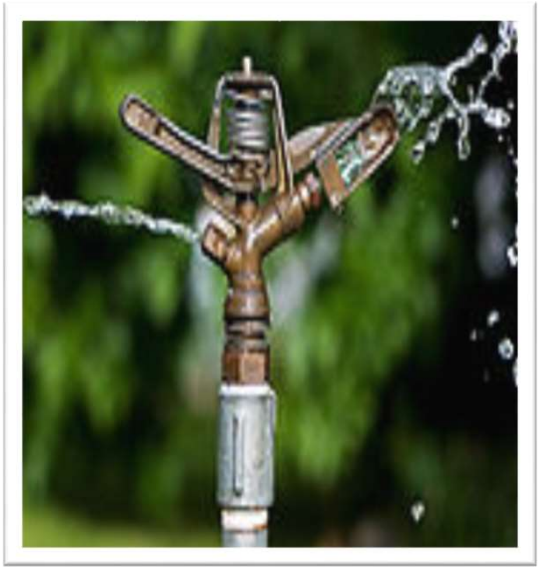
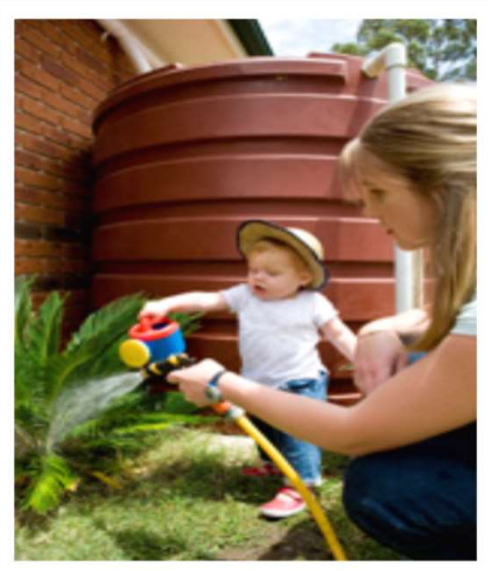
Best Practices: Watering

- Sprinkler systems – make sure to adjust as the conditions change
- Drip Irrigation – effective at supplying 1-4gal/hr. Little water loss due to evaporation
- Hand Watering – easily avoid overwatering
- Mulching – reduces evaporation from the soil





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Best Practices: Watering

- The best time to water is **early morning –** winds are calm, temperatures are cool.

- Frequent watering promotes shallow root growth.
  - - 1.5 inches /week on heavy (clayey) soils or
  - 0.5 to .75 inches twice a week on light (sandy) soils
  - **MINUS PRECIPITATION**

- Raised beds may need more water because they can dry out quickly.

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Best Practices: Watering

- Don’t allow irrigation to become stormwater runoff.
- Avoid sprinklers that produce a fine mist and avoid watering in windy weather.
- Water deeply and less frequently

http://www.clemson.edu/public/carolinaclear/what_you_can_do/homeowners.html

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Best Practices: NJ varieties

- Require less watering because they are adapted to our climate – can reduce outdoor water use by 20 to 50%

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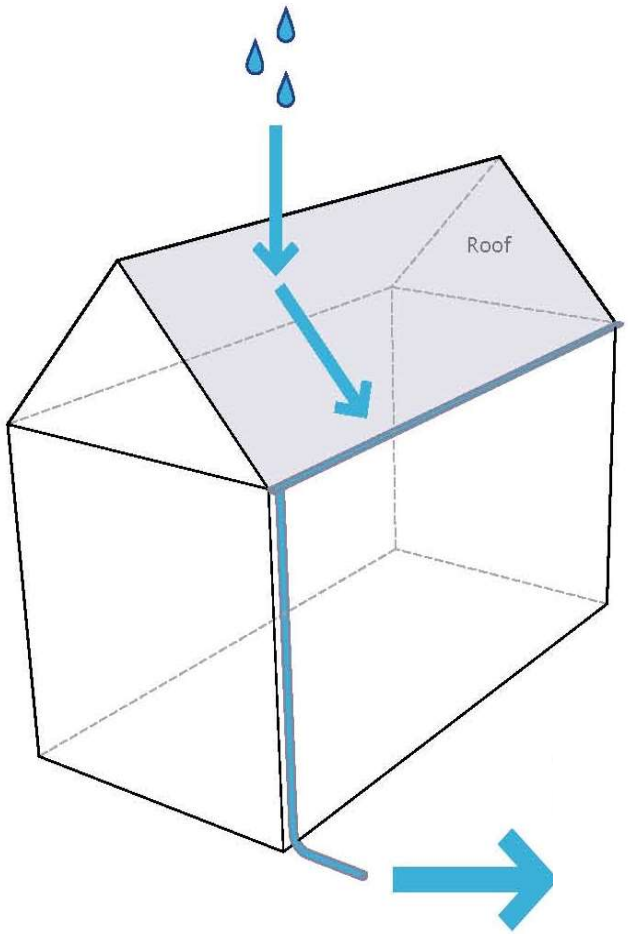
Best Practices: Rainwater Harvesting



Disconnect the downspout by installing a cistern

usplastics.com

Reduce the amount of runoff produced at farm

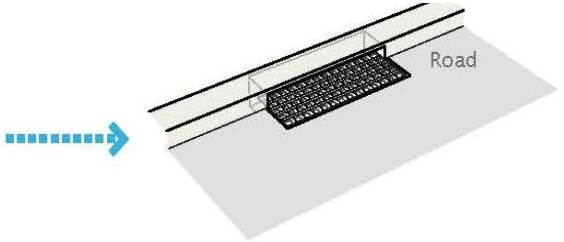


Diagram: Rutgers Water Resources Program

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Best Practices: Rainwater Harvesting

Michele Bakacs

- Residential rain water harvesting:
  - Rain Barrels
- Commercial rain water harvesting:
  - Cisterns

Wncgbc.org

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How much water can you harvest from one rooftop?

Using a roof area of 800 ft^2 (80’ x 10’)

centexcooks.com

1" rainfall event = 500 gallons

44" rainfall per year = 22,000 gallons

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Small-scale

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Large-scale

Poly-mart.com

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Things to Remember

Livestock Use

- Calculate water demand based on species

Irrigation Use

- Calculate water demand based on crop
- Apply water directly to soil, not to fruit or leaves

Both Uses

- Covered tanks reduce evaporation and keep water cleaner
- First flush diverter is useful for lowering contaminant load

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Best Practices: Greenhouse Irrigation Recycling

- Flood floor

pinterest.com

- Flow floor

porkandplants.com

- Flood bench
- Trenches

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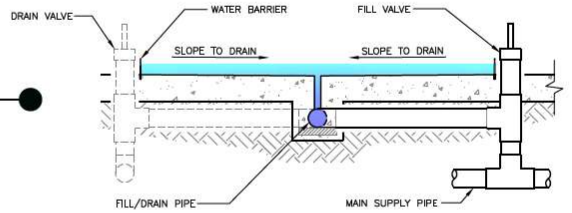
Best Practices: Greenhouse Irrigation Recycling

Flood Floor

- **Cross Section**: "V" or "W" pattern.
- **Flow Pattern**: common fill and drain pipe located along floor valleys.
- **Watering Cycle**: floor fills, floor drains then water is available for use in next zone.
- **Cycle Time**: 6-10 minutes (minimum).
- **Material**: precision installed structural concrete.
- **Containment**: flexible rubber barrier surrounding floor perimeter which allows for ample employee and cart access.

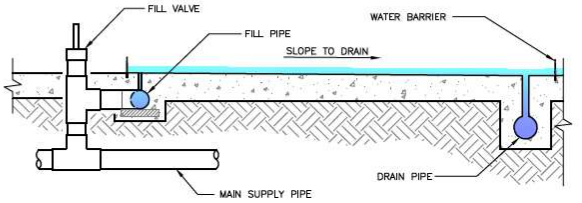
Flood Floor
Cross Section



Cascade Floor

- **Cross Section**: unidirectional slope.
- **Flow Pattern**: independent fill pipe flowing to common drain pipe located at valley between two floors.
- **Watering Cycle**: floor fills and drains simultaneously which makes water immediately available for same cycle use.
- **Cycle Time**: only what you need (5-6 minutes typical).
- **Material**: precision installed structural concrete.
- **Containment**: flexible rubber barrier surrounding floor perimeter which allows for ample employee and cart access.

Cascade Floor
Cross Section



biothermsolutions.com

americover.com

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Best Practices: Greenhouse Irrigation Recycling

- Can drain all water to collection pond or tanks
- May need to aerate to manage biochecmical oxygen demand (BOD)
- Filtration
- Need to manage pathogens:
  - Slow sand filtration
  - Ozone (O_3)
  - Ultraviolet irradiation (UV)

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Questions?

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