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## Demonstration Garden Successes Usable in Your Own Garden

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Photo credits: Steve Mayer or as listed

## Purdue Extension Marion County Intech Park (2009-2011)



Photos: Steve Mayer



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## Purdue Extension Marion County State Fairgrounds (2012-Present)



Photos: Steve Mayer

## Goals of the Demonstration Garden

- Education
- Establish flower and vegetable plantings to demonstrate how to grow edible and ornamental plants



Photo: Steve Mayer

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## Goals of the Demonstration Garden

- Provide a display garden to show All-America Selections award-winning flowers and vegetables (<https://all-americaelections.org/>)
- Show various gardening techniques such as raised beds, row covers, vertical gardening and efficient irrigation
- Provide vegetables for a local food pantry

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## The PEMC Demonstration Garden

- An "idea garden" for gardeners
  - Comments from Indiana State Fair visitors: "Beautiful garden, found several ideas for my garden." "We've learned a lot of garden tips from you over the years." The garden is "my favorite part of the State Fair."
- Not an organic garden but we try to limit the use of pesticides whenever possible

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## Friends in Our Garden



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## Developed & Maintained by PEMC Staff & EMG Volunteers

- Purdue Extension Marion County (PEMC) staff & Extension Master Gardener (EMG) volunteers design, plant & maintain the garden each year as well as harvest & deliver the donated produce
- The garden would not be possible without the efforts of EMG volunteers



Photos: Steve Mayer

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## Recognized as AAS Display Garden

- Beginning in January 2013, the Purdue Extension Marion County Demonstration Garden applied for and was accepted to be an official All-America Selections (AAS) Display Garden for flowers and vegetables, one of about 200 dedicated gardens across the U.S. and Canada



Image: All-America Selections

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## Recognized as AAS Display Garden

- We are one of only 8 All-America Selections (AAS) Display Gardens in Indiana and still the only one in Indianapolis (as of 1/2023)
- An AAS Display Garden provides the public an opportunity to view the newest AAS winners, primarily from the past 5 years



Zinnia x hybrida Profusion Double Hot Cherry

Photo: Steve Mayer

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## Indiana AAS Display Gardens (Jan '23)

- Foellinger-Freimann Botanical Conservatory, Fort Wayne, IN
- Hendricks County Master Gardeners Demonstration Garden, Danville, IN
- Master Gardener Association of Tippecanoe County, Lafayette, IN
- Minnetrissa, Muncie, IN
- Purdue Extension Marion County Demonstration Garden, Indianapolis, IN
- Southwest Indiana Master Gardener Demonstration Garden, Evansville, IN
- Sunset Hill Farm Vegetable Garden, Valparaiso, IN (*edibles only*)
- Hamilton County Master Gardeners, Noblesville, IN (*flowers only*)

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## All-America Selections (AAS)

- Founded in 1932, AAS is the only national, non-profit plant trialing organization in North America
- Mission: "To promote new garden varieties with superior garden performance judged in impartial trials in North America"
- AAS does not breed, or sell, any plants, but promotes the winners & lists seed sources on their website



Images: AAS

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## All-America Selections (AAS)

- AAS conducts 4 types of plant trials each year to determine if there are new varieties worthy of the AAS Winner award designation:

- Edibles Grown From Seed** (grown in-ground & in containers)
- Seed Ornamentals** (grown in-ground & in containers)
- Non-Seed Ornamentals** (grown in-ground & in containers)
- Perennials**

Images: AAS

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## All-America Selections (AAS)

- AAS Trials are conducted at locations across N.A. by volunteer, independent, unbiased, horticulture professionals
- National Winners & Regional Winners (began in 2014)
- Non-Seed Ornamentals category started in 2015
- First Perennial Trial winners were in 2019



Images: AAS

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## All-America Selections (AAS)

- Breeders enter their NEW, never-before-sold cultivars to AAS Trials to see if they have created a variety that is superior to what is currently on the home garden market
- AAS Judges grow & evaluate entries alongside well-known successful similar varieties used as comparisons
- If entry out-performs comparisons & is deemed superior to what is available, it is given an AAS award

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Images: AAS

## All-America Selections (AAS)

- AAS Judges look for traits such as:
- More flowers
- Better branching
- Disease resistance
- Better taste (edibles)
- Higher yield (edibles)
- Unique plants/new colors



Images: AAS

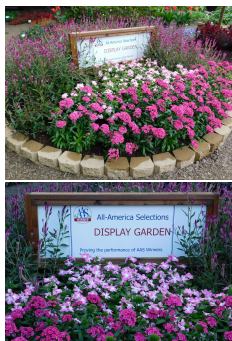
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## We Are Growing Better Varieties

- Because we are a part of the AAS Display Garden program, we learn about better flower & vegetable varieties and grow them
- <https://all-america-selections.org/> or <https://aaswinners.com>

- Celosia Asian Garden
- Vinca Mega Bloom Pink Halo
- Dianthus Jolt Pink

Photos: Steve Mayer



## 1984 AAS Winner

### Tomato 'Celebrity'

- 8 oz tomatoes
- Disease resistance



Photos: Steve Mayer

Determinate, 70-75 days to Harvest

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1994 AAS Winner



## Tomato 'Big Beef'

- 8-12 oz tomatoes
- In 2022, harvested 98+ lbs from 2 plants (49 lbs/plant)
- Disease resistance



Photo: Steve Mayer



Photos: All-America Selections



Indeterminate, 73 Days to Harvest (Transplant)

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2020 AAS Winner



## Tomato 'Galahad'

- Regional AAS Winner (Heartland & W/NW)
- In 2022, harvested 140+ lbs from 4 plants (35 lbs/plant), 9-12 oz
- On 8/21/2021, 1 day of harvest from 1 plant at home: 31 ripe tomatoes, weighing 18 lbs & 9 oz (ave. 9.5 oz/tomato)

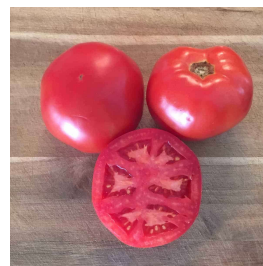


Photo: All-America Selections

Determinate, 75 days to Harvest

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2014 AAS Winner



## Tomato 'Chef's Choice Orange'

- 9-12 oz, orange tomatoes
- In 2022, harvested 60+ lbs from 2 plants



Indeterminate, 75 days to Harvest Photos: Steve Mayer

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1939 AAS Winner



## Okra 'Clemson Spineless'



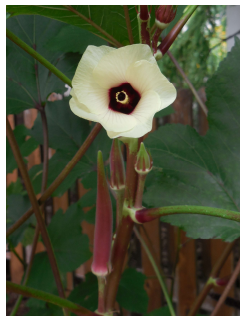
Photo: All-America Selections

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2017 AAS Winner



## Okra 'Candle Fire'



Photos: Steve Mayer



Purdue University

1935 AAS Winner



## Cucumber 'Straight Eight'



Photo: All-America Selections

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2020 AAS Winner



## Cucumber 'Green Light'

- Thin skinned, mini cucumber without seeds harvested at 3-4 inches long



Photos: Steve Mayer

37-42 Days to Harvest (Seed)

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2014 AAS Winner



## Sweet Pepper 'Mama Mia Giallo'



Photos:  
Steve Mayer

Also 'Escamillo' (2016 AAS) & 'Cornito Giallo' (2016 AAS)

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## Add Organic Matter

- The single most important thing you can do to improve your soil is to add organic matter
- Options include: compost, manures (preferably composted), cover crops, and plant residues
- For in-ground plantings, work in one-third by volume organic matter (2-inch layer worked 6 inches deep, 3-inch layer worked 9 inches, etc.)



Photo: Steve Mayer

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## Practice Good Soil Health Principles (Source: Marion County SWCD) For Annual Crops

- Minimize Disturbance – Disturb the soil as little as possible
- Maximize Soil Cover – Keep the soil covered as much as possible
- Maximize Biodiversity – Using crop rotation and cover crops
- Provide Continuous Living Roots – Keep plants growing throughout the year

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## Minimize Working of Soil

- A tiller was used extensively in 2012 and a little less in 2013
- Mostly hand dug in 2014 (wanted to help promote soil health and preserve tree roots in west half of garden)
- Began using cover crops in some beds in the fall of 2015



Photo: Steve Mayer

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## Cover Crops



Photos: Steve Mayer

## Cover Crops

- This planting bed shows crimson clover and oats
- Also planted hairy vetch and cereal rye
- Using oats alone does not require cover crop termination since it does not usually survive the winter



Photo: Steve Mayer

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## For Free Mulch, Use Cereal Rye

- For free mulch, use cereal rye (mixed with hairy vetch) as a cover crop the previous fall



Photos: Steve Mayer

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## Practice Crop Rotation

CORN FAMILY	Sweet Corn, Popcorn
CUCUMBER FAMILY	Gourds, Cucumber, Cantaloupe, Squash, Pumpkin, Muskmelon, Watermelon
ONION FAMILY	Onions, Shallots, Garlic, Leek
TOMATO FAMILY	Eggplant, Pepper, Potato, Tomato

Image: Steve Mayer

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## Practice Crop Rotation

BEAN FAMILY	Beans, Peas
BEET FAMILY	Beets, Spinach, Swiss chard
CABBAGE FAMILY	Cabbage, Cauliflower, Brussels sprouts, Broccoli, Mustard, Turnips, Collards
CARROT FAMILY	Carrot, Celery, Parsnip

Image: Steve Mayer

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## Use a Grabber Tool for Maintenance in Large Beds

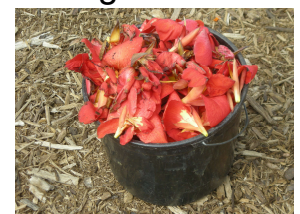


Photo: Steve Mayer

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## Use a Grabber Tool for Maintenance in Large Beds

- Use for deadheading large flowers
- Don't carry spent flowers in your hand (bees!)



Photos: Steve Mayer

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## For Quicker Success, Use Raised Beds & Start with a Soil-Compost Mix

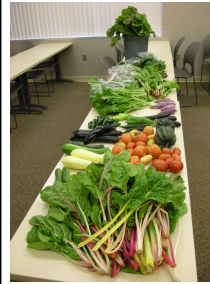
- Intech Park site was compacted & drainage was poor so raised beds were required
- Applied a 50/50 blend of topsoil and garden compost to create the raised beds



Photos: Steve Mayer

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## It's Never to Late to Start



Photos: Steve Mayer

- First year of Intech Park demonstration garden in 2009: 600 sq. ft. of vegetables
- Transplants planted on July 14
- First harvest was August 17 (summer squash, eggplant, pepper and cucumber)



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## It's Never to Late to Start



- Primarily grown in 15-foot by 4-foot raised beds
- One bed had 3 Roma plants & 2 Early Girl plants
- Covered plants in fall when frosts were forecast
- Total harvest on November 11 was over 368 pounds

Photos: Steve Mayer

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## It's Never to Late to Start



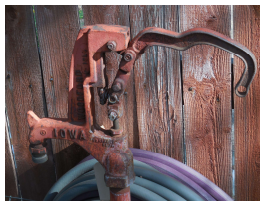
Photos: Steve Mayer

- 5 tomato plants were transplanted July 14
- Through November 11, we harvested 271 Roma tomatoes and 80 Early Girl tomatoes = 351 tomatoes
- Final tomato harvest was November 25

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## Water Availability Should Influence What You Do

- Access to water is needed
- Plan your garden accordingly



Photos: Steve Mayer

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## Two Types of Soil Tests Are Needed for Plant Growth

- Send soil samples to a commercial lab for NUTRIENT TESTING: phosphorus (P), potassium (K), pH, and percent organic matter
- A&L Great Lakes Labs in Fort Wayne provides results and recommendations - a Lawn & Garden test is \$25.00 (<https://algreatlakes.com/>)

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## Two Types of Soil Tests Are Needed for Plant Growth

- After the 2012 season, soil test results were:
  - 10 to 13 percent organic matter level (high)
  - Phosphorus (very high) & Potassium (very high)
  - pH reading: 8.0 (alkaline)
- After the 2021 season, soil test results were:
  - 11.4, 14.2, 17.2 to 24.1 percent organic matter level (high)
  - Phosphorus (very high) & Potassium (medium)
  - pH reading: 7.1, 7.2, 7.2, to 7.3 (slightly alkaline)

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## Two Types of Soil Tests Are Needed for Plant Growth

- Conduct a DRAINAGE TEST when choosing the site



Photos: Steve Mayer

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## Two Types of Soil Tests Are Needed for Plant Growth

- *Purdue publication HO-61*: Dig a hole 10 inches deep; fill it with water and allow the water to drain away; if the hole is empty in 8-10 hours, the site is acceptable
- *Publication HO-99*: Dig a hole 10 inches deep; fill it with water; if the water drains quickly, you have a droughty soil; if the water drains after an hour or two, you have a well-drained soil; if the water stands overnight, you have poorly drained soil

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## Two Types of Soil Tests Are Needed for Plant Growth

- Mike Dana, Purdue: Dig hole 12" deep; fill with water; let it drain away; refill with water & record water depth (A); measure & record water depth 15 minutes later (B);  $A - B = \text{Amount drained}/15 \text{ min.}; \times 4 \text{ amount /hour}$ ; if  $<4"/\text{hr}$ , poorly drained; if between 4-8  $"/\text{hr}$ , moderately drained; if  $>8"/\text{hr}$ , excessively drained
- Ed Gilman, U of FL: Dig hole 18" deep; fill with water; if drains in 1 hour, drainage is good; if several hours to drain, drainage is fair; if water stands > day, it's poor

*Purdue Master Gardener Manual, 2<sup>nd</sup> Edition, ©2018*

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## Select Flowers That Don't Require Deadheading

- For lower maintenance
- Influenced by the desired aesthetics
- Depends on the flower species and cultivar
- Consult AAS website for deadheading on specific flowers: [aaswinners.com](http://aaswinners.com)

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2015 AAS Winner

## Petunia 'Tidal Wave Red Velour'




Photos: Steve Mayer

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**2002 AAS Winner**

**Petunia 'Tidal Wave Silver'**




Photos: Steve Mayer

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**2019 AAS Winner**

**Petunia 'Wave Carmine Velour'**




Photos: Steve Mayer

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**2019 AAS Winner**

**Vinca Mega Bloom Polka Dot**




Photos: Steve Mayer

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**2006 AAS Winner**

**Ornamental Pepper Black Pearl**



Photos: Steve Mayer

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**2018 AAS Winner**

**Ornamental Pepper Onyx Red**



Photos: Steve Mayer

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**Save Time & Water  
with a Drip Irrigation System**



Photos: Steve Mayer

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## Use a Laundry Tub as a Garden Sink



Photo: Steve Mayer

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## Consider Raised Beds

- Height: 6" minimum, 12" or more is better
- Width: no wider than 4 feet for adults
- Length: flexible



Photos: Steve Mayer

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## Raised Beds Have Advantages

- Improved soil drainage
- Less soil compaction
- Easier weed control
- Warmer soil temperature in spring
- Ease of access
- Reduced soil erosion
- Avoid contaminated soil



Photos: Steve Mayer

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## Which Type of Raised Bed Depends on Different Factors

- Ease of construction
- Available time
- Cost
- Durability
- Aesthetics
- Function
- Physical needs of the gardener



Photo: Steve Mayer

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## To Reduce Cost, No Frames Were Used on the Raised Beds to Start

- No frames the first year: Lumber was used only in the bed formation process

Photos: Steve Mayer



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## Use Lumber to Make Frameless Beds

- Neither garden had framed raised beds the first year
- Lumber & stakes were used only in the bed formation process



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Photos: Steve Mayer



## Lumber & Edging for Frameless Beds

- Boards, edging & stakes were used to make informal frameless beds



Photo: Steve Mayer

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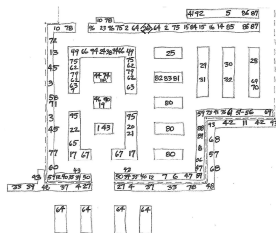
## Use Larger Masses of Flowers for Greater Color Impact



Photo: Steve Mayer

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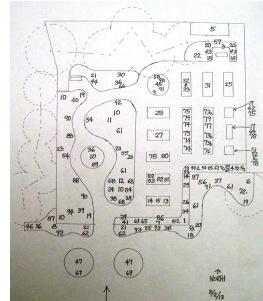
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Photos: Steve Mayer

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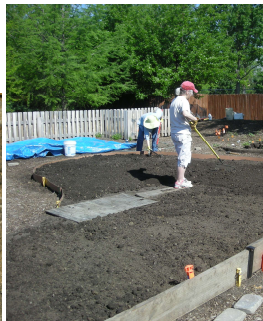


Photos: Steve Mayer

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## Avoid Soil Compaction

- Do not step in the beds – use boards to minimize compaction if necessary



Photos: Steve Mayer

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## Use Row Covers to Exclude Insects

- To prevent flea beetle damage on eggplant



Photos: Steve Mayer

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## Use Row Covers to Exclude Insects

- To prevent damage from squash vine borer & squash bug on squash and pumpkin
- Cover is removed when flowering begins



Photos: Steve Mayer



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## Use Row Covers to Exclude Insects

- Insect Mesh Grow Tunnel to prevent damage to beans from bean leaf beetles
- 10' long & 16-18" high



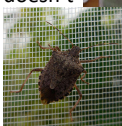
Photos: Steve Mayer

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## Use Row Covers to Exclude Insects

- To prevent bacterial wilt on cucumber via infected cucumber beetles
- Uses half-inch white PVC and a heavy duty screening material called Micromesh
- Used Diva cucumber that doesn't require pollination to set

Stink bug:



Photos: Steve Mayer

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## Grow Cannas from Seed

- Sow seed indoors by late February and transplant outside after frost in May
- Size of plant at the end of the first season:



Photos: Steve Mayer

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2013 AAS Winner

## Canna 'South Pacific Scarlet'



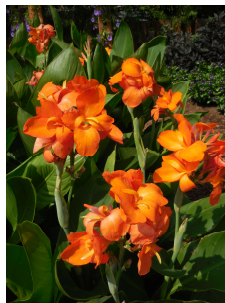
Photos: Steve Mayer



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2018 AAS Winner

## Canna 'South Pacific Orange'



Photos: Steve Mayer

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NOT AAS Winners

## 'South Pacific Rose' & 'South Pacific Ivory'



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## Consider Triangular Tomato Cages

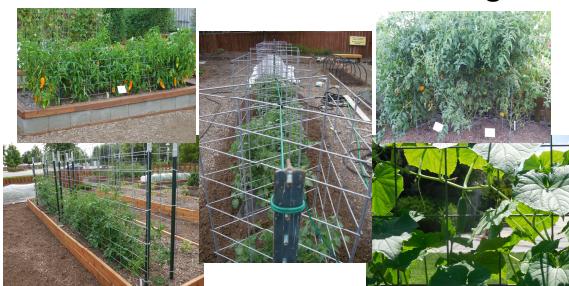
- Right: Concrete Remesh, 8-foot by 4-foot sheet, 6-inch square mesh = 2' by 2' by 2.5' cage
- Left: Cattle Panel Fencing, 16-foot by 50" fence section, 6-inch by 8-inch mesh = 2' by 2' by 2' cage or 16" by 16" by 16" cage
- Tied together with plastic zip ties (cable ties)



- Can be folded for storage at the end of the season

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## Found Our Favorite Construction Material: Cattle Panel Fencing



Photos: Steve Mayer

- 1<sup>st</sup> used in 2013

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## Cattle Panel Fence Arbors



Photos: Steve Mayer

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## Ascending Pole Bean Trellis

- From west to east, the pole bean helps shade some cool-season crops during the summer



Photos: Steve Mayer

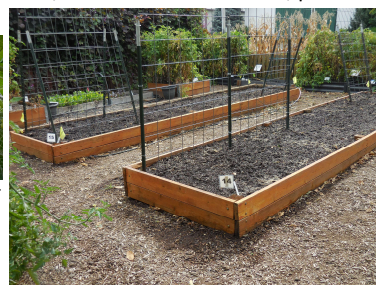
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## Three More Cattle Panel Structures

- Small melon A-frame, vertical cucumber fence, pole bean arch



Photos: Steve Mayer



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## Use Annuals for Variety Each Year

- To add new All-America Selections award-winning flower and vegetable cultivars (cultivated varieties) each year
- To show new gardening ideas
- To display new garden designs each year

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## Use Annuals for Varied Design 2013: BEFORE



Photo: Steve Mayer

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## Use Annuals for Varied Design 2013: AFTER



Photo: Steve Mayer

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## Use Annuals for Varied Design 2015: BEFORE



Photo: Steve Mayer

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## Use Annuals for Varied Design 2015: AFTER



Photo: Steve Mayer

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## Using Black Plastic & Plant Protectors for Earlier Harvest

- Four Treatments
  - No mulch (mid-May)
  - Black plastic (mid-May)
  - Red plastic (mid-May)
  - Black plastic and Wall O' Water (WOW) (mid-April)
- Black plastic: 1 week earlier to first ripe tomato
- Black plastic + WOW: 2 weeks earlier

Photo: Steve Mayer



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## Not All Determinate Tomatoes Ripen All at Once

- Home garden determinate tomatoes may have a time when there is a major flush of tomatoes to harvest, but they do NOT stop producing before the end of the season if plants stay healthy
- Examples from our demonstration garden include **Celebrity** (1984 AAS Winner), **Galahad** (2020 AAS Winner, N/NW, Heartland regions), & **Early Resilience** (2020 AAS Winner)
- Even **Roma** produced until frost

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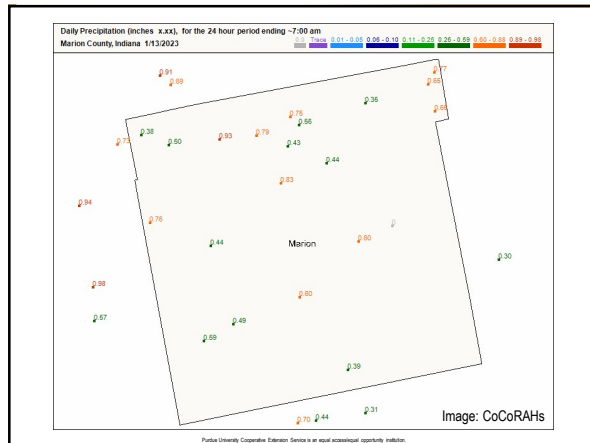
## Monitor the Precipitation on Site

- Precipitation varies greatly from site to site
- If you don't have a rain gauge, monitor precipitation via CoCoRAHS: <https://www.cocorahs.org/>



Photo: Steve Mayer

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## Hand Watering: How Much to Water

- In-ground plantings need 1-1.5 inches of water/week often applied in 1-2 irrigations
- 1-1.5 inches of water = about 0.6-0.9 gallons/sq. ft.
- Raised beds may need more frequent watering
- Container plants might need daily watering



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## Avoid Wetting the Foliage When Possible

- Avoid wetting the foliage to avoid disease problems especially late in the day
- Never water the foliage of disease-prone plants like tomato and pepper plants

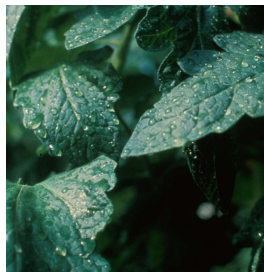


Photo: Unknown Source

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## Select Disease Resistant Varieties

- Select Zinnias resistant to powdery mildew
- Zinnia elegans tend to be more susceptible
- We have never seen powdery mildew on zinnias in the Profusion and Zahara series

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### Select Disease Resistant Varieties

- All are AAS Winners
- Profusion Red Yellow Bicolor (2020)
- Profusion Red (2017)
- Profusion Double Deep Salmon (2013)
- Profusion Double Hot Cherry (2013)
- Double Zahara Cherry (2010)
- Double Zahara Fire (2010)
- Zahara Starlight Rose (2010)
- Profusion White (2001)
- Profusion Cherry (1999)
- Profusion Orange (1999)

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2020 AAS Winner

### Zinnia 'Profusion Red Yellow Bicolor'



Photos: Steve Mayer

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2017 AAS Winner

### Zinnia 'Profusion Red'



Photos: Steve Mayer

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2010 AAS Winner

### Zinnia 'Double Zahara Fire'



Photos: Steve Mayer

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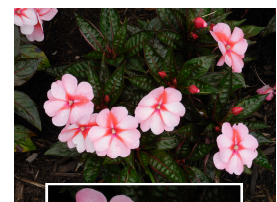
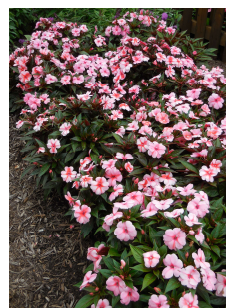
### Select Disease Resistant Varieties

- Select Impatiens resistant to downy mildew

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2014 AAS Winner

### Impatiens "Florific™ Sweet Orange"



Photos: Steve Mayer

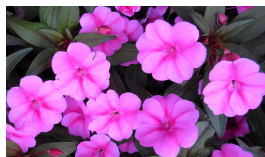
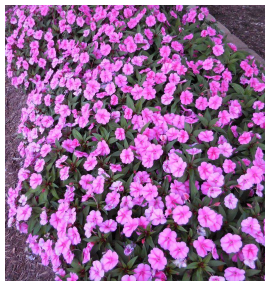
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2015 AAS Winner



## Impatiens 'Bounce Pink Flame'



Photos: Steve Mayer

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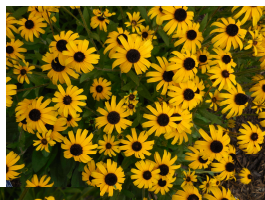
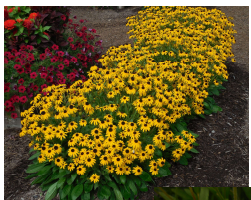
## Select Disease Resistant Varieties

- Select Rudbeckias resistant to Septoria leaf spot

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2020 AAS Winner  
PERENNIAL

## Rudbeckia American Gold Rush



Photos: Steve Mayer

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## Cucumbers: Intensive Planting on a Vertical Trellis

- Direct seeded into a 4-foot wide, 1-foot deep raised bed
- Planted intensively on a vertical trellis & thinned seedlings to 6 inches apart along the fencing
- Trellis was 6 feet tall & almost 8 feet long, with metal T-posts & plastic zip ties

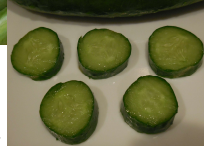


Photos: Steve Mayer

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## Cucumbers: Intensive Planting on a Vertical Trellis

- In 2022, we harvested & donated just over 239 pounds of Green Light cucumbers (2020 AAS Winner) from 16 plants growing in an 8-foot by 4-foot space
- Harvested at suggested 4-inch long mini-cucumber stage but some were also picked larger



Photos: Steve Mayer

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## Flower Planting Concerns

- Remove plants by first tapping/pushing/pinching container bottom



Photo: Steve Mayer

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## Flower Planting Concerns

- Disrupt surface of root ball, tease out roots, remove excess roots, and/or cut circling roots, if needed



Photo: Steve Mayer

Disrupted root ball surface on right

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## Flower Planting Concerns

- After planting, firm the soil, water and use a fertilizer solution if needed
- Do NOT gather soil around the stem above the root ball

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## Leggy Transplants



Trimming Back Leggy Tidal Wave Petunias

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## Pinching Flowers?



- Plume celosia pinched at planting time (flowers on top are pinched and flowers on bottom are not)

Photo: Steve Mayer

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## Know What Herbicide Damage Looks Like on Food Crops

- Diagnosing Herbicide Injury on Garden & Landscape Plants (ID-184): [https://www.extension.purdue.edu/extmedia/id/id\\_184\\_w.pdf](https://www.extension.purdue.edu/extmedia/id/id_184_w.pdf)



## Grow Pole Beans Rather than Bush Beans

- Plant once to harvest all season
- Usually easier to harvest
- Pole beans seem to have less problems with spider mites

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2017 AAS Winner

### Pole Bean 'Seychelles' – Angled Trellis



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Photos: Steve Mayer

2017 AAS Winner

### Pole Bean 'Seychelles' – On Arch



Photos: Steve Mayer

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### Many Newer Coleus Grow in Full Sun

- Many new coleus can grow in full sun or shade now
- Flowering is usually considered a negative characteristic – best if it flowers only late in the season or not at all

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2020 AAS Winner

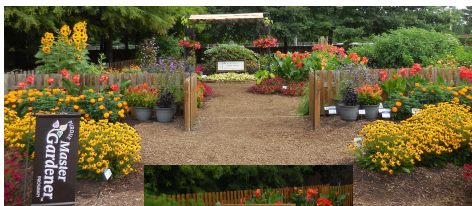
### Coleus Main Street Beale Street



Photos: Steve Mayer

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### Use Flowers for an Accent



Photos: Steve Mayer

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### Sustain Nutrient Levels Through the Season

- Consider a slow release fertilizer
- Nutrient level checking?



Photos: Steve Mayer

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## Sustain Nutrient Levels Through the Season

- Additional fertilizer may be needed for spring transplants in “chop & drop” cover crop areas

Photos: Steve Mayer

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## Be Safe When Harvesting Vegetables

- Wear one-use only gloves when harvesting and put the harvest into clean, sanitized containers (or wash hands & put harvest in new plastic bags)
- Don't wash produce until time to be eaten
- Wash all produce before eating!

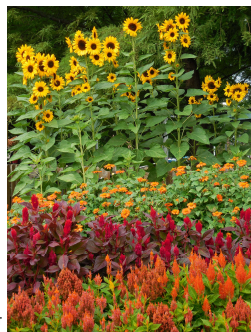


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## Flower Borders: Stair Step Plant Heights



- Stair step plant heights



Photos: Steve Mayer

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## Using Marking Flags for Planting



Photos: Steve Mayer



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## Consider Plant Spacing



Photo: Steve Mayer

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## Consider Vertical Structures Strawberry Tower



Photos:  
Steve  
Mayer  
2016

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## Consider Vertical Structures

- Flower Towers: Built in 2017 from cedar pickets (stabilized with vertical rebar)



Photos: Steve Mayer

## Consider Vertical Structures



Photos: Steve Mayer

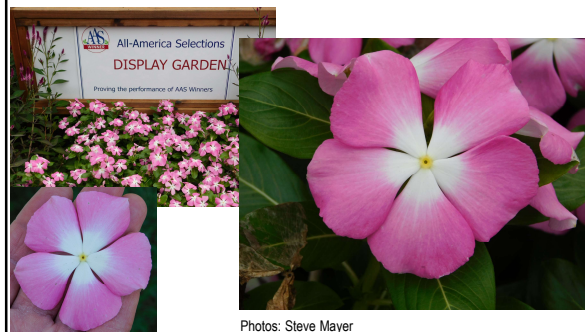
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## Enjoy the Flowers

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## Vinca 'Mega Bloom Pink Halo'



Photos: Steve Mayer

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## Zinnia 'Double Zahara Fire'



Photos: Steve Mayer

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## Dianthus 'Jolt Pink'



Photos: Steve Mayer

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2017 AAS Winner

## Zinnia 'Profusion Red'



Photos: Steve Mayer

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## Demonstration Garden Successes Usable in Your Own Garden

**Steve Mayer**

**Extension Master Gardener**

**Retired Extension Horticulture Educator**

**Purdue Extension Marion County Demonstration Garden**

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**Photo credits: Steve Mayer or as listed**