

Major Diseases of Peppers and Tomatoes in Illinois and Their Management

Mohammad Babadoost
University of Illinois
babadoos@illinois.edu
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Important Pepper Diseases in Illinois

- Phytophthora blight
- Bacterial spot

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Important Pepper Diseases in Illinois

- Phytophthora blight
Phytophthora capsici

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Phytophthora blight of bell pepper

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Phytophthora blight of pepper

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Phytophthora Blight of Peppers (Management)

- Resistant cultivars
- Cultural practices
- Chemical control

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Conclusions

Greenhouse and field trials showed that following bell pepper cultivars are resistant/tolerant to *Phytophthora capsici* (Illinois Isolates)

- Alliance
- Aristotle
- Emerald Isle
- Enza
- **Intruder**
- **Paladin**
- Reinger
- Revolution

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Phytophthora Blight Management (Host Range: 37 Crops and 9 Weed Species)

| Host | | | Non-Host | | |
|-------------|-------------|---------|-----------|-----------------|----------|
| Cantaloupe | Cucumber | Gourd | Corn | Pigweed | Soybean |
| Eggplant | pepper | Beet | Broccoli | Kale | Cabbage |
| Pumpkin | Squash | Radish | Chives | Celery | Basil |
| Zucchini | Watermelon | Turnip | Sandbur | Wheat | Barley |
| Honeydew | Swiss-chard | Carrot | Crabgrass | Water-hemp | Dill |
| Spinach | Nightshade | Onion | Mustard | Cauliflower | Kohlrabi |
| Green bean | Lima bean | Tomato | Parsley | Puncture-vine | |
| Velvet-leaf | Snow pea | Tobacco | Cocklebur | Lamb's-quarters | |

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Managing Phytophthora Blight

- Effective fungicides:
 - ❖ Orondis Ultra (FRAC: U15, 40)
 - ❖ Revus: (FRAC: 40)
 - ❖ Ranman (FRAC: 21) + Silwet L-77
 - ❖ Elumin (FRAC: 22)
 - ❖ Presidio (FRAC: 43)

Spray at weekly schedule; alternate with fungicide with different FRAC code

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Managing Phytophthora Blight

- Recommended practices
 - ❖ Plant resistant cultivars
 - ❖ ≥3 years of effective crop rotations
 - ❖ Grow on raised beds
 - ❖ Avoid using contaminated water
 - ❖ Fungicide applications (7-day intervals, alternate)
 - ❖ Tolerant cultivars with fungicides

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Important Pepper Diseases in Illinois

Bacterial Spot

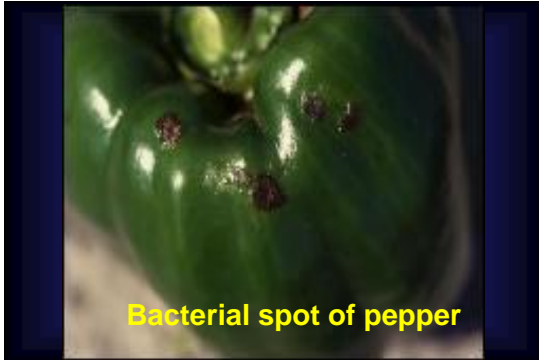
(*Xanthomonas campestris* pv. *vesicatoria*)

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Bacterial Spot of Peppers (Management)

- Use pathogen-free seed
- Plant certified disease-free transplants
- Crop rotation: 2 years
- Prevent water-splashing in greenhouse
- Spray copper (i.e., Kocide-3000) + mancozeb (i.e., Manzate PRO Stick) are effective for managing bacterial spot of peppers

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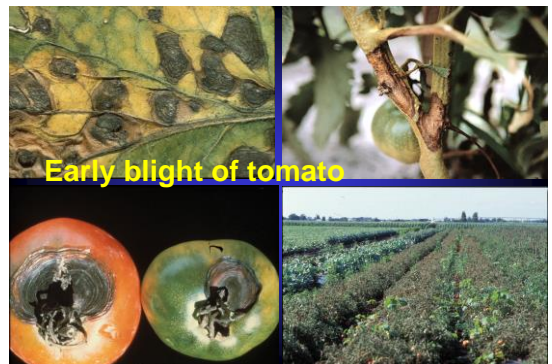
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Important Tomato Diseases

- Fungal diseases
 - ❖ Early blight
 - ❖ Septoria leaf blight
 - ❖ Anthracnose
- Bacterial disease
 - ❖ Bacterial canker
 - ❖ Bacterial speck
 - ❖ Bacterial spot

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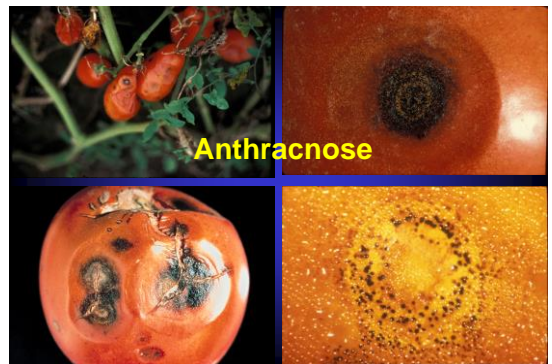
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Management of Tomato Early Blight, Septoria Leaf Spot, and Anthracnose

- Crop rotation: 3-4 years
- Fungicide use:
Quadris
 Alternated with
Chlorothalonil (i.e., Bravo W. Stik)

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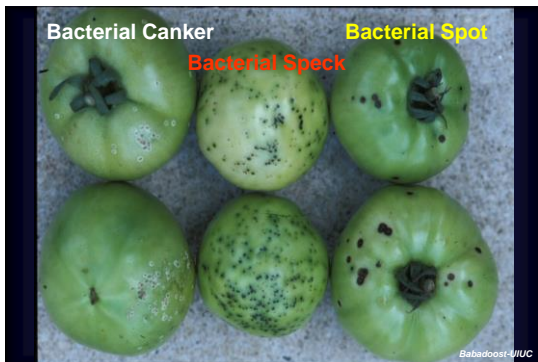
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Bacterial Diseases of Tomatoes

- Bacterial canker: *Clavibacter michiganense* pv. *michiganense*
- Bacterial speck: *Pseudomonas syringae* pv. *tomato*
- Bacterial spot: *Xanthomonas* spp.

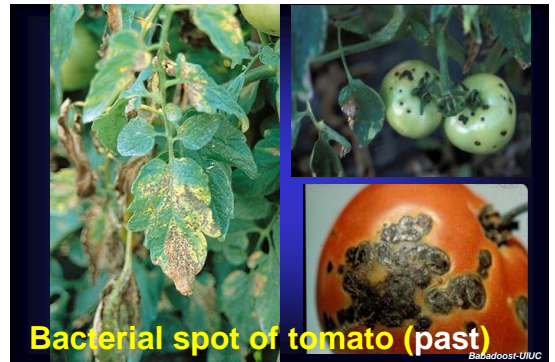
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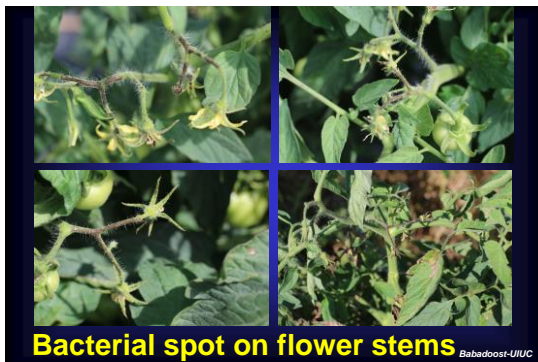
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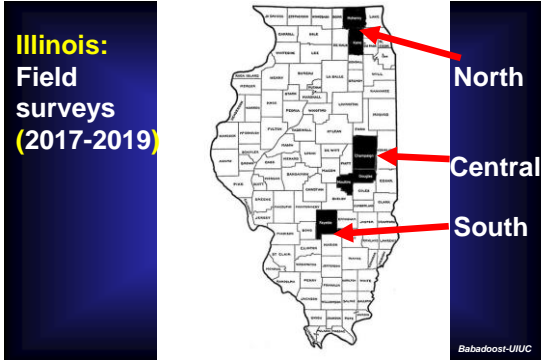
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Our Research on Bacterial Spot

- Research: 2017 - 2019
- Field survey: monitored development of bacterial spot in the south, central, & north
- Monitored tomato cultivars: Biltmore, Carolina Gold, Brandywine, Chefs Choice, Dixie Red, Heirloom, Phoenix, Primo Red, Pony Express, Red Duce, Red Morning, Rocky Top
 None resistant to bacterial spot
- Pathogen species: *X. vesicatoria* (past)
 Now: *X. perforans* and *X. gardneri*

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Severity of Bacterial Spot - Foliage (%)

| Region | 2017 | 2018 | 2019 |
|----------|--------------|---------------|---------------|
| Northern | 4-19 (12) | 38-91 (64) | 0-88 (46) |
| Central | 3-5 (4) | 9-19 (10) | 5-75 (55) |
| Southern | 9-38 (20) | 9-81 (50) | 45-92 (70) |

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Incidence of Bacterial Spot - Fruits (%)

| Region | 2017 | 2018 | 2019 |
|----------|------|-------|-------|
| Northern | <10 | 10-25 | 15-25 |
| Central | 0 | 0 | 20-30 |
| Southern | <5 | 10-20 | <5 |

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Xanthomonas Species Collected

| Region | Foliage | | Fruit | |
|--------------|--------------------|---------------------|--------------------|---------------------|
| | <i>X. gardneri</i> | <i>X. perforans</i> | <i>X. gardneri</i> | <i>X. perforans</i> |
| Northern | 54 | 9 | 24 | 4 |
| Central | 13 | 17 | 4 | 2 |
| Southern | 34 | 94 | 4 | 7 |
| Total | 101 | 120 | 32 | 13 |

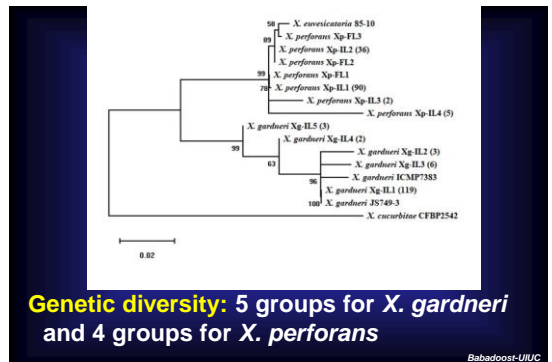
Total: 266 isolates

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- Bacterial Spot of Tomato in Illinois**
- Dominant species in northern Illinois: *X. gardneri*
 - Dominant species in southern Illinois: *X. perforans*
 - Dominant species on fruits in Illinois: *X. gardneri*
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Managing Tomato Bacterial Diseases

- Plant less susceptible/tolerant cultivars
- Plant pathogen-free seed and seedlings
- A 3-year crop rotation
- Field sanitation: remove old material
- Plant varieties separately
- Control volunteer plants and weeds
- Use clean crates, boxes, and stakes
- Do not enter the field if the foliage is wet
- Disinfect pruning tools

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Managing Tomato Bacterial Diseases

- Avoid cull pile in the field
- Scout your field weekly (**Not in Wet Con.**)
- Spray plants with effective bactericides; beginning at first sign of the disease

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Effective Chemicals for Managing Tomato Bacterial Spot

- Effective chemicals: **Kocide-3000, Manzate PRO Stick, Agriphage, Regalia, LifeGard, Quintec**
- Recommended sprays:
Manzate PRO Stick + Kocide-3000
alternated with
Regalia + Kocide-3000

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**Thanks for
Your Attention**

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