Trouble Shooting Vegetable Production Problems

Important factors for consideration
- Field patterns
- Symptom recognition

Don't jump to conclusions!
- First make field observations and collect the information from those involved.
- Take everything into consideration.
- And make your conclusion after you have seen everything.

Items Needed When Troubleshooting
- shovel
- knife
- hand lens
- camera
- a note pad
- plastic bags
- an open mind

Important Information
- What is normal for this crop?
- What was planted last season?
- Is there one or more varieties or seed sources?
- When did symptoms appear?
- What was applied to the crop (how much, when, how)?
- What part of the field and plant are symptomatic?
- Are weeds showing symptoms too?
- What is bordering the affected field?

Distribution of symptoms in the field
**In & Out Pattern**

- Example: An edge of the field where there are often 4 bad rows followed by 4 normal rows, then 4 bad rows again.
- The good/bad row pattern may repeated with 4, 6, or 8 rows involved. It depends upon the tractor application pattern and the number of tractors used.

**In & Out Patterns**

- Patterns may be due to cultivation.
- Planters not being adjusted properly.
- The equipment not being lifted too soon.
- Or set down too late.
- Valve not turned on at right time

**Kerb herbicide injury**

- Long straight roots
- no branching
- all white

**Down the Row Patterns**

- Chemical injury due to herbicides or fertilizer overdose, often found in repeating row patterns
- Cultivator damage
- Poor irrigation practices

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Damage on edges of field

- Drift
- Double trim with aerial spray
- Excess fertilizer or other chemicals when slowing down
- Insects & other animals
- Head and tail ends of fields are not planted so there is no carryover of debris or chemicals in the next crop (may be better or worse)

Rabbit Feeding Damage
Another pattern from the edge

Herbicide Drift

South-facing view

North-facing view

Herbicide Drift

100 ft 200 ft 300 ft 400 ft
Distance from wheat

Random Patterns
- Insect damage
- Environmental damage
  - frost, wind whip, air pollution, sunburn, hail
- Birds
- Carry-over fertilizer injury
- Crop residue injury
- Nematodes

Random pattern

Root symptoms

Needle nematode - *Longidorus africanus*
**Streaks that Occur at Angles**
- Chemical drift
- Changes in soil physical properties
  - sand streaks, clay layer
- Salinity, usually poor drainage
- Crop residue causing injury
- Crop residue providing benefit.
- Nematodes
- Carry-over fertilizer

**Sudangrass crop residue discolored roots**

**Plant Symptoms and Possible Causes**

**Discoloration of Leaves**

**Veinal chlorosis - virus, pigment inhibitor herbicide**
Interveinal chlorosis - nutrient deficiency, virus, photosynthesis inhibitor herbicides

Mosaic alternating light and dark
Virus

Marginal Chlorosis - Cupric Hydroxide injury

Leaf Distortions

Growth Regulators
2,4-D
MCPA
MCPP
triclopyr (Garlon, Turflon)
dicamba (Banvel)
clopyralid (Stinger)

Virus
CuLCrV
WMV
ZYMV
Necrosis on Leaves

Foliar lesions
variable size, variable color, concentric zones
Possible causes - fungal, bacterial diseases

Early blight (Alternaria solani)

Necrotic lesions with mosaic symptoms

Angular Necrotic Lesions - limited by veins
bacterial or fungal disease

Lettuce Dieback Disease
Lettuce Necrotic Stunt Virus (LNSV)

Lettuce Downy Mildew - Bremia lactucae

Marginal necrosis or spots

Root symptoms

organosilicon surfactant
linuron drift

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Herbicide - Inhibitors of Cell Division

Nematodes
- Especially bad on sandy soils
- Needle Nematode (Longidorus africanus)
- Root Knot Nematode (Meloidogyne sp.)

Vascular discoloration - fungal disease or fertilizer toxicity
- Fusarium Wilt
  *Fusarium oxysporum f. sp. lactucum*
- Fertilizer burn

Root lesions
- Lesions/constrictions at or below soil line = fungi

Limitations of Field Diagnosis
- Several conditions may cause similar symptoms
- More than one production problem may be involved
- Symptoms of the same cause can look different on different crops, varieties or under different environmental conditions
- Laboratory tests may be required to make a positive identification

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