Agronomy – It's a Package deal …

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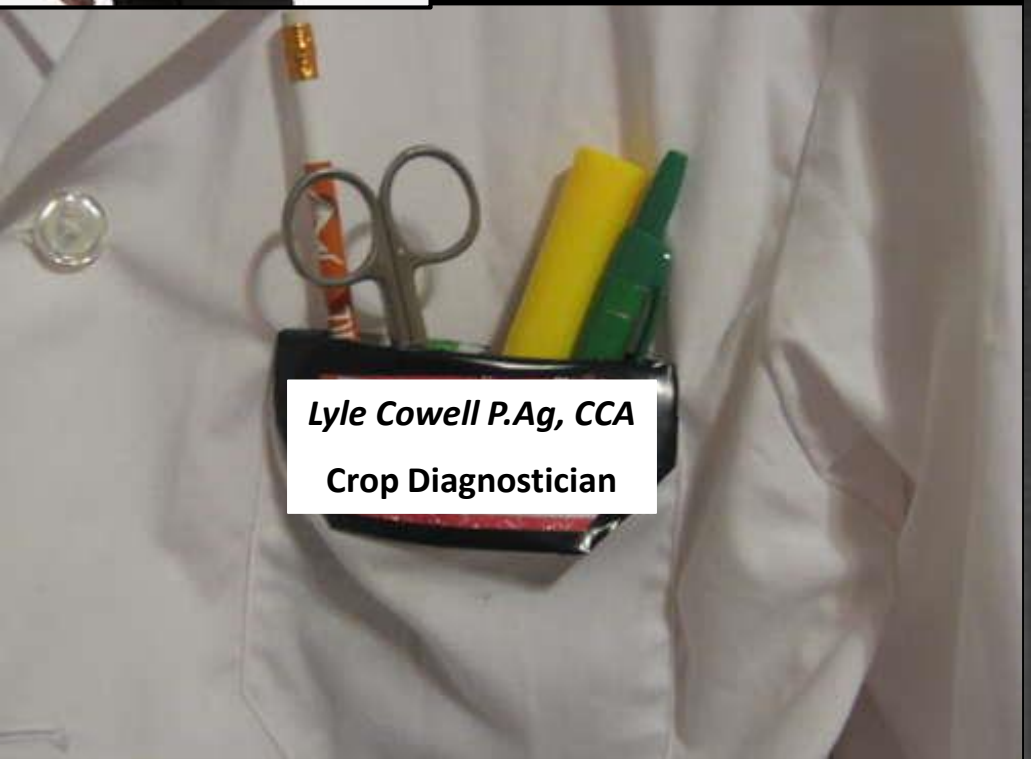
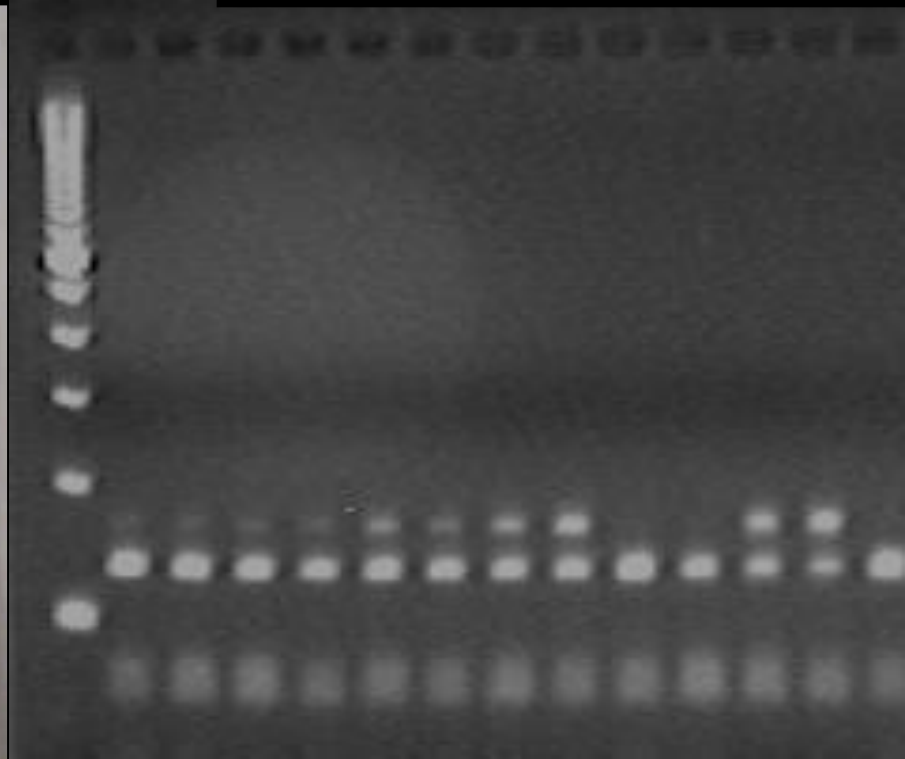
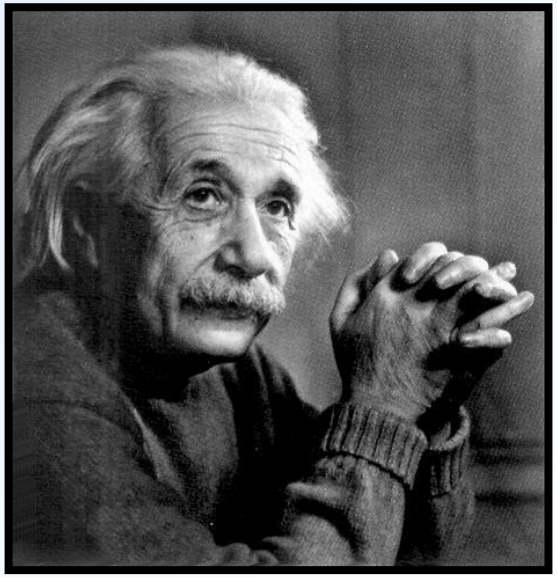

Lyle Cowell P.Ag, CCA
Crop Diagnostician



Crop Production Services

Crop Diagnostics

- *Attitude, Knowledge and Ability*
- *Grey Hair or No Hair*



Crop Production Services


1. Don’t jump to conclusions …
2. Follow a process …
3. Be able to defend your conclusions … !

Crop Diagnostics Process

- ***Investigate*** – observe, ask, and listen
- ***Document*** – record, map, take pictures
- ***Analyze*** – background information and observations
- ***Potential causes*** – soils, fertility, insects, diseases, environmental, seed, etc
- ***Diagnosis*** – backed up by the facts?

The Wide Angle Look

- *Crop growth (general)*
- *Patterns in the field*
- *How much of the field is affected?*

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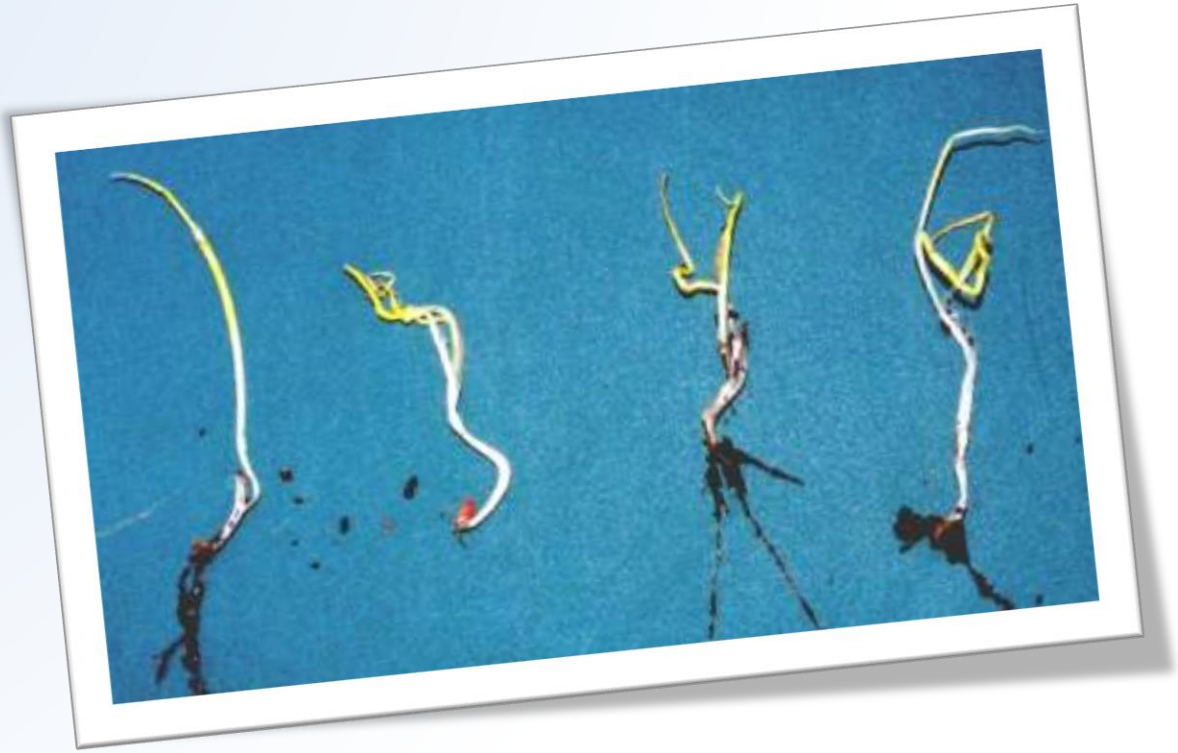
Observations: Zooming In

- ***Plant parts affected***
  - Cotyledons
  - Newest leaves
  - Older leaves
  - Stems
  - Roots



- ***Plant Color***
  - Yellowing (chlorotic)
  - Brown (necrotic)
  - Purple or red
  - Grayish, whitish

Observations: Zooming In

- ***Abnormal growth***
  - –Damaged growing point
  - –Excessive branching
  - –Bending, twisting, leaf cupping
  - –Swollen roots – base of stem

Crop Production Services

Comparing "good" vs "bad"

Comparing "good" vs "bad"

Soil samples (0-6", 6-24") from each area to determine if crop nutrition or soil characteristics (OM%, pH, Salinity, texture) are factors.

Comparing "good" vs "bad"

- ***Tissue Samples***?

- ***Plant samples*** to Crop Protection Lab for disease identification?

Performance Inquiry / Crop Diagnostics Checklist *May, 2004*

1. **Crop Establishment**

- **Varieties and Seed Treatments**
  - i. Could this particular variety exhibit this trait? Eg. Purple coloration (Mackenzie wheat), seed color of 46H23, true loose smut in Westford
  - ii. Consider differences between semi-dwarf wheat (short coleoptile) vs hard red spring wheat, hybrid vs open-pollinated or synthetic canola
  - iii. Seed Treatment – does it control the disease found (smut, seedling diseases)? Or insect problem (eg. Wireworm),

- **Seeding Tool / Seed Placement / Seeding rates and Emergence**
  - i. Conventional, minimum or direct seeded? Was the chaff and straw from the previous

A Process of Elimination!

  - iv. Consider possible multiple causes for poor emergence (eg. Deep seeding, cold soils, fertilizer injury, dry conditions, etc)
  - v. Patches of uneven or no emergence? How large are they? Do they correspond to variation in soil type?
  - vi. Patterns – if mechanical, does the pattern correspond to seed depth and placement variation across the seeding tool?
  - vii. Consider speed of seeding and impact on seed placement inc depth and packing
  - **viii.** Consider excess fan speed and the impact it might have on seed quality
  - ix. Check seed size (1000 kwt) and seeding rates. Consider impact on stand density
  - x. How many days till the crop emerged?

2. **Crop Protection**

- **Crop injury**
  - i. Do the symptoms resemble herbicide injury? Consider other environmental, disease or insect injury symptoms that may resemble herbicide injury.
  - ii. Check for weather data from the closest weather station?
  - iii. Do symptoms resemble possible residual herbicide injury? Did you consider moisture, temperature, pH, organic matter and how it might affect the breakdown of residual products applied?
  - iv. Do the symptoms resemble those of the herbicides that were applied? Consider the different symptoms caused by translocated and contact herbicides.

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Crop Diagnostics 2017

- A series of pictures outlining a field diagnostic situation
- Realize you will not have all the details and seeing pictures is not the same as being in the field
- The pictures form discussion points on proper crop diagnosis
- There is no passing mark and your responses are anonymous

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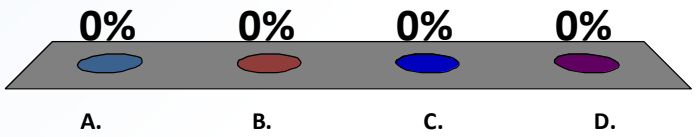
#1 - *In the past 5 years, how many crop diagnostic situations have you been involved in?*

A. None

B. Less than 5

C. 5-20

D. 20+



Crop Production Services

02

A. *Soil type*

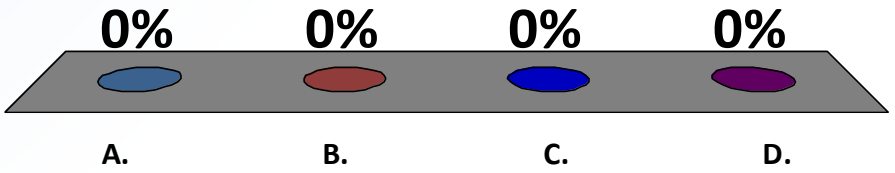
B. *Copper deficiency*

C. *Take-all root rot*

D. *Black Sooty Mold –*

Scenario #02

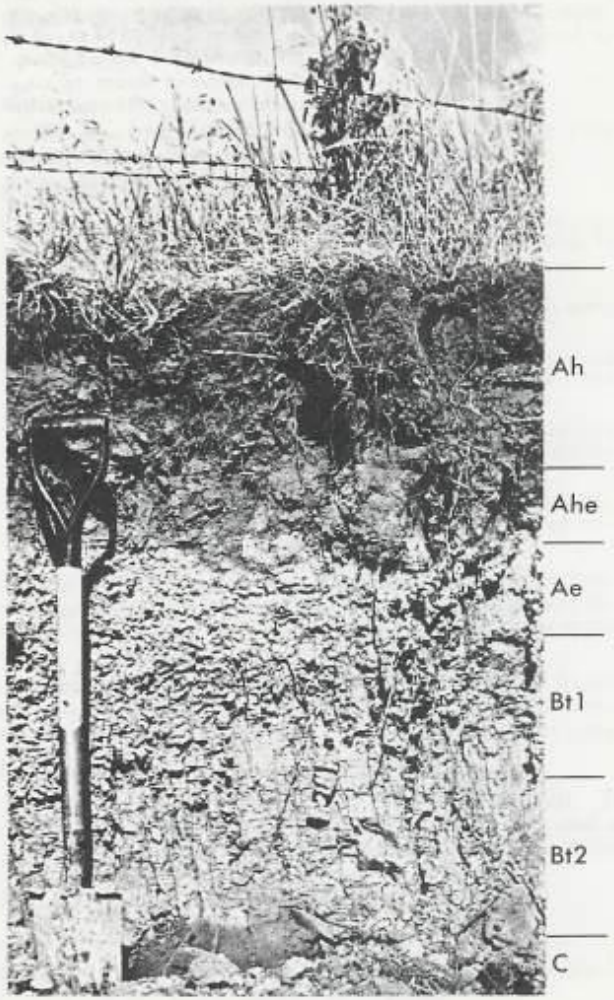
A. Soil type
B. Copper deficiency
C. Take-all root rot
D. Black Sooty Mold



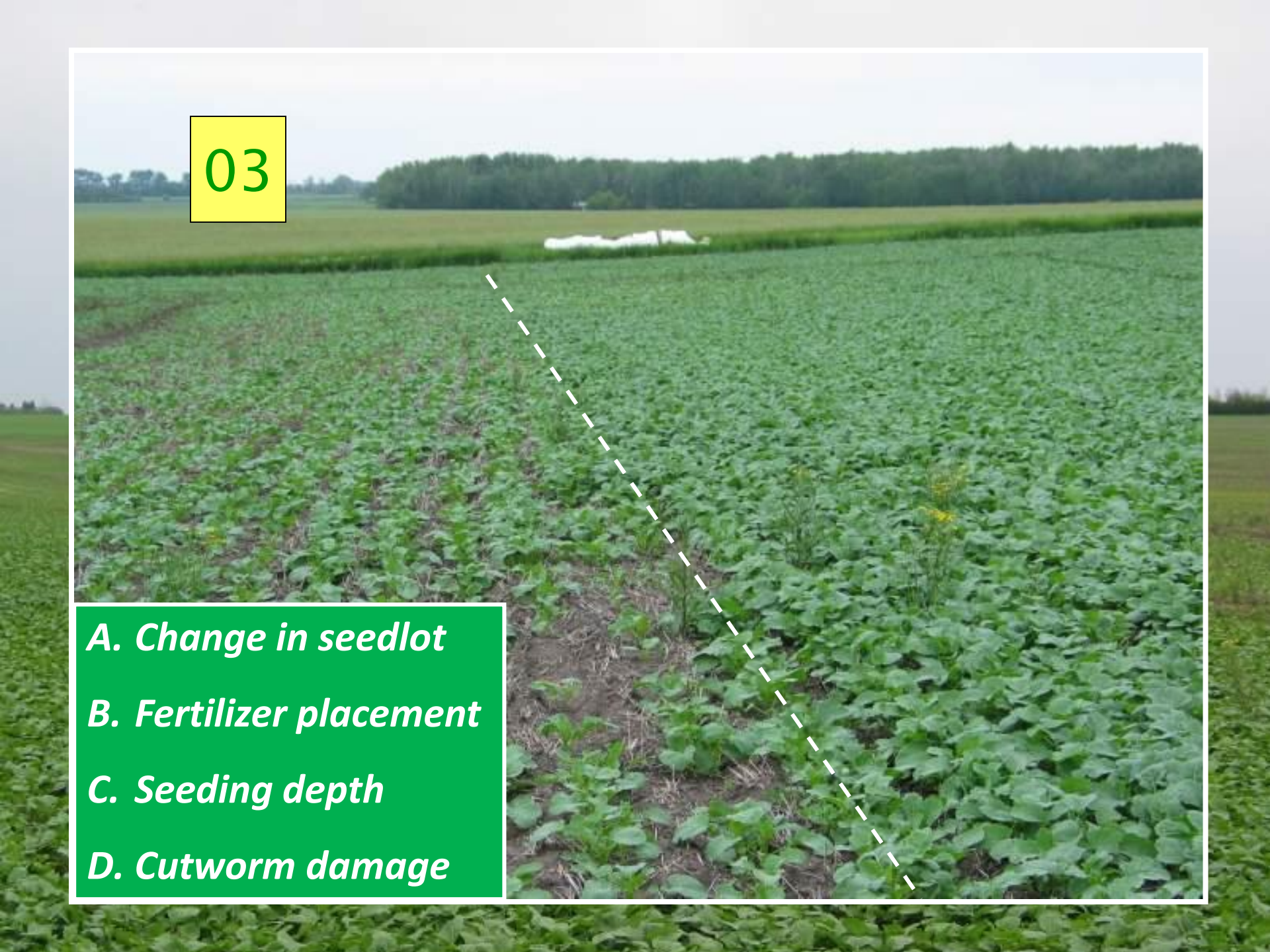
Crop Production Services


02


02

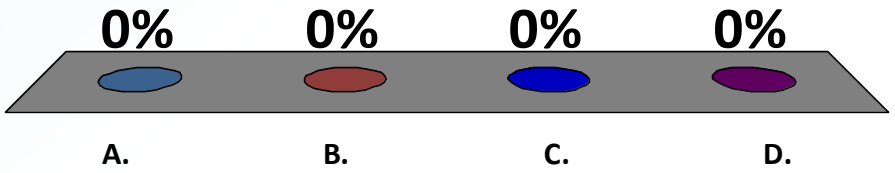


Eluviated Black

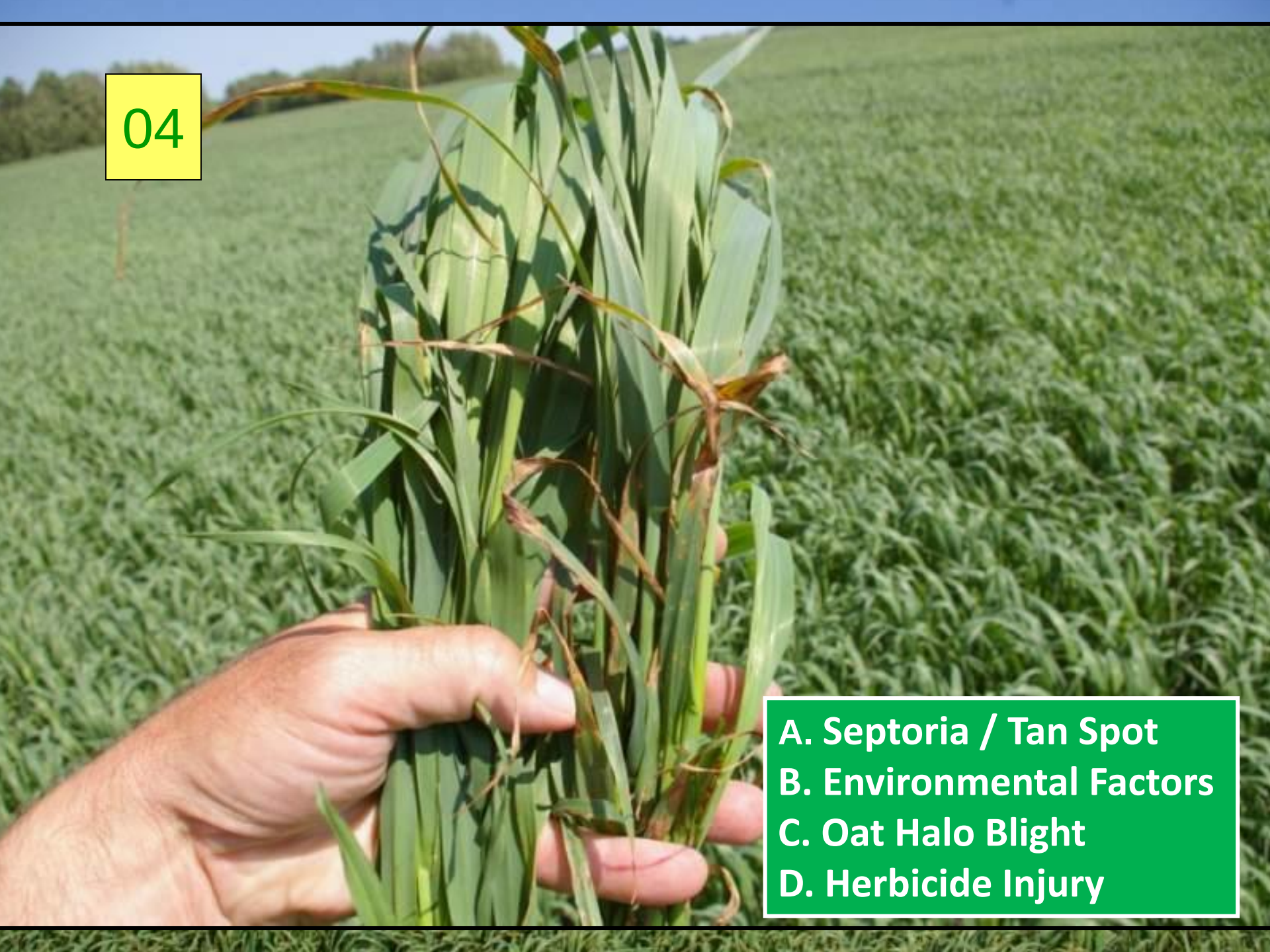

03
A. Change in seedlot
B. Fertilizer placement
C. Seeding depth
D. Cutworm damage

Scenario #03

A. Change in seedlot
B. Fertilizer placement
C. Seeding depth
D. Cutworm damage

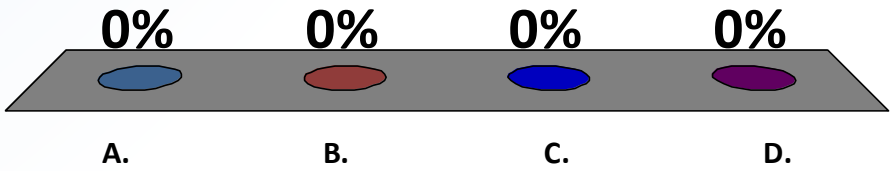


Crop Production Services


04
A. Septoria / Tan Spot
B. Environmental Factors
C. Oat Halo Blight
D. Herbicide Injury

Scenario #04

A. Septoria/Tan Spot
B. Environmental factors
C. Oat halo Blight
D. Herbicide Injury



Crop Production Services

05

A. Sulfur deficiency

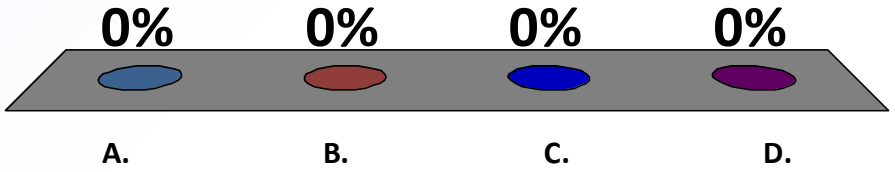
B. Hail damage

C. Herbicide residue

D. Salinity

Scenario #05

A. *Sulfur deficiency*
B. *Hail damage*
C. *Herbicide residue*
D. *Salinity*



Crop Production Services


05
Higher pH = 7.4
Loam to clay loam texture
Lower pH = 5.8
Sandy texture

06

A. Boron deficiency

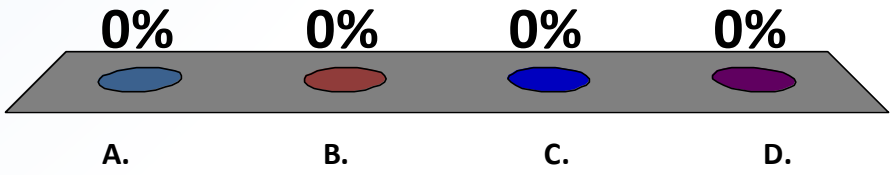
B. Sulfur deficiency

C. Drought

D. Mn Toxicity

Scenario #06

A. Boron deficiency
B. Sulfur deficiency
C. Drought
D. Manganese toxicity



Crop Production Services

06

Manganese (Mn) Toxicity

Factors	Good	Poor
pH	5.5	4.9
Soil Test Mn (ppm)	46	106
Tissue test Mn (ppm) Top growth	1370	2186
Tissue test Mn (ppm) Entire plant	181	433

Boron - Reddish pods, Stunted Growth

Courtesy of


07

07

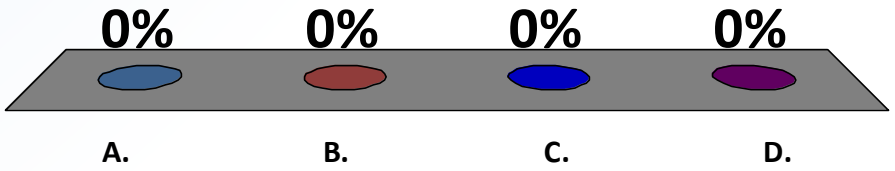
Crop Production Services


07


07

Scenario #07

A. *Suspect seed quality*
B. *Boron deficiency*
C. *Phosphorus deficiency*
D. *Sulfur deficiency*



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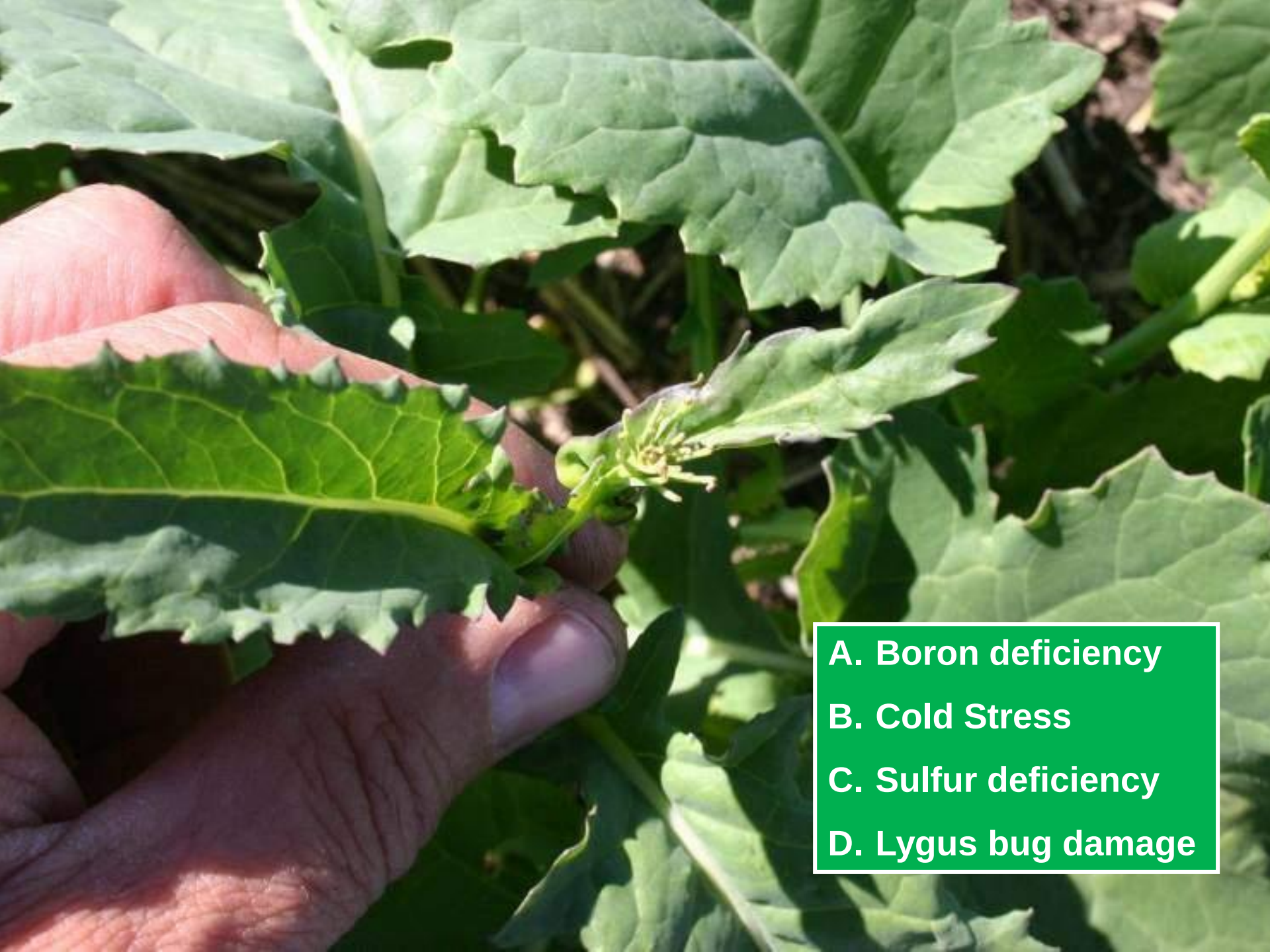
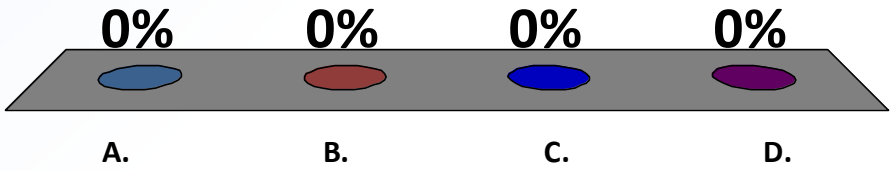
P deficiency
thin stand,
delayed
maturity


P deficiency
poor pod set,
extended
maturity

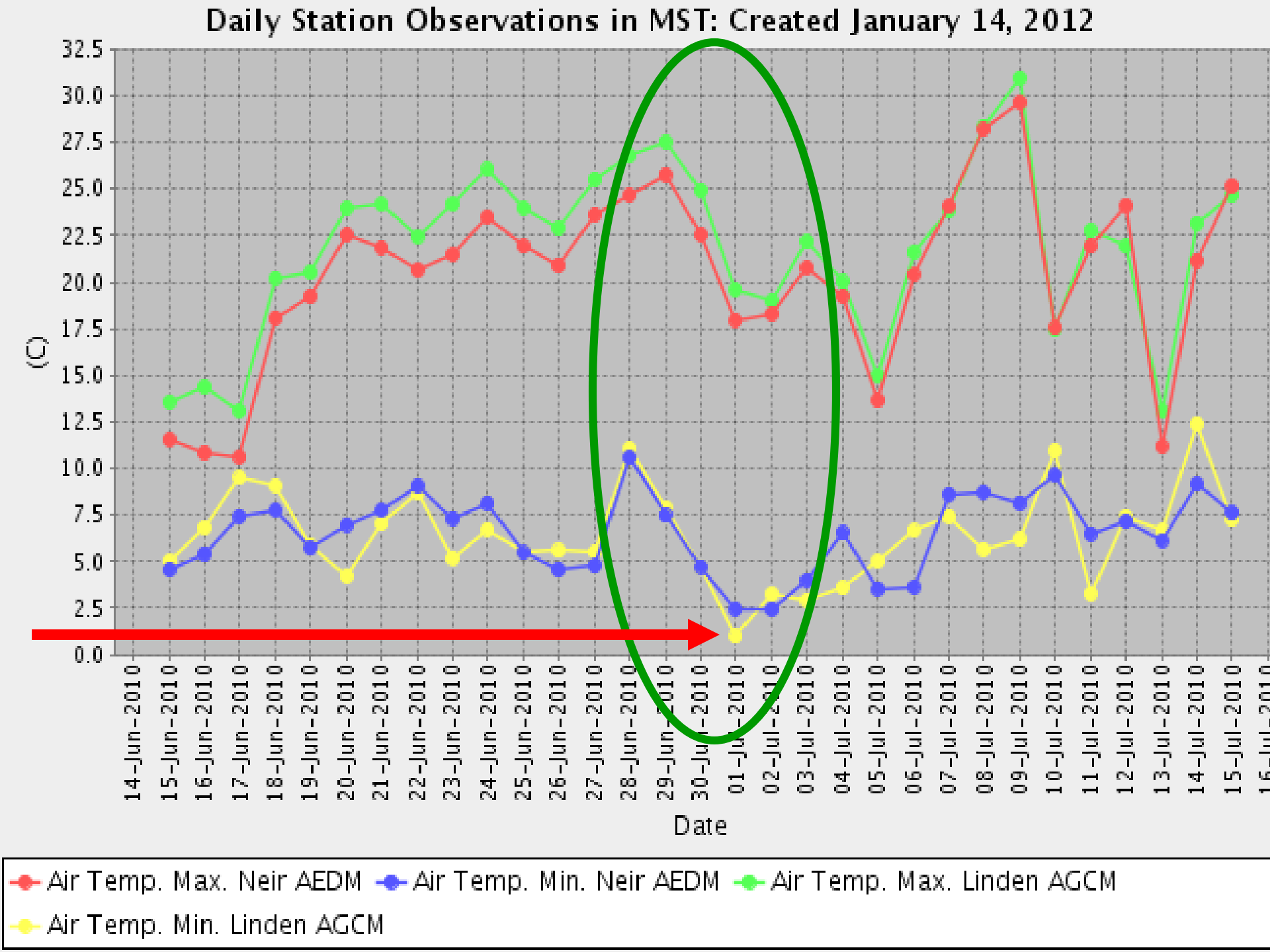

A. Boron deficiency
B. Cold Stress
C. Sulfur deficiency
D. Lygus bug damage

Scenario #08

A. Boron deficiency
B. Cold stress
C. Sulfur deficiency
D. Lygus bug damage



Crop Production Services


Daily Station Observations in MST: Created January 14, 2012
(C)
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30.0
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
14-Jun-2010
15-Jun-2010
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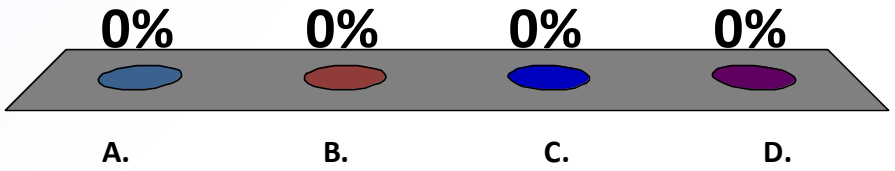
14-Jul-2010
15-Jul-2010
Date
Air Temp. Max. Neir AEDM
Air Temp. Min. Neir AEDM
Air Temp. Max. Linden AGCM
Air Temp. Min. Linden AGCM

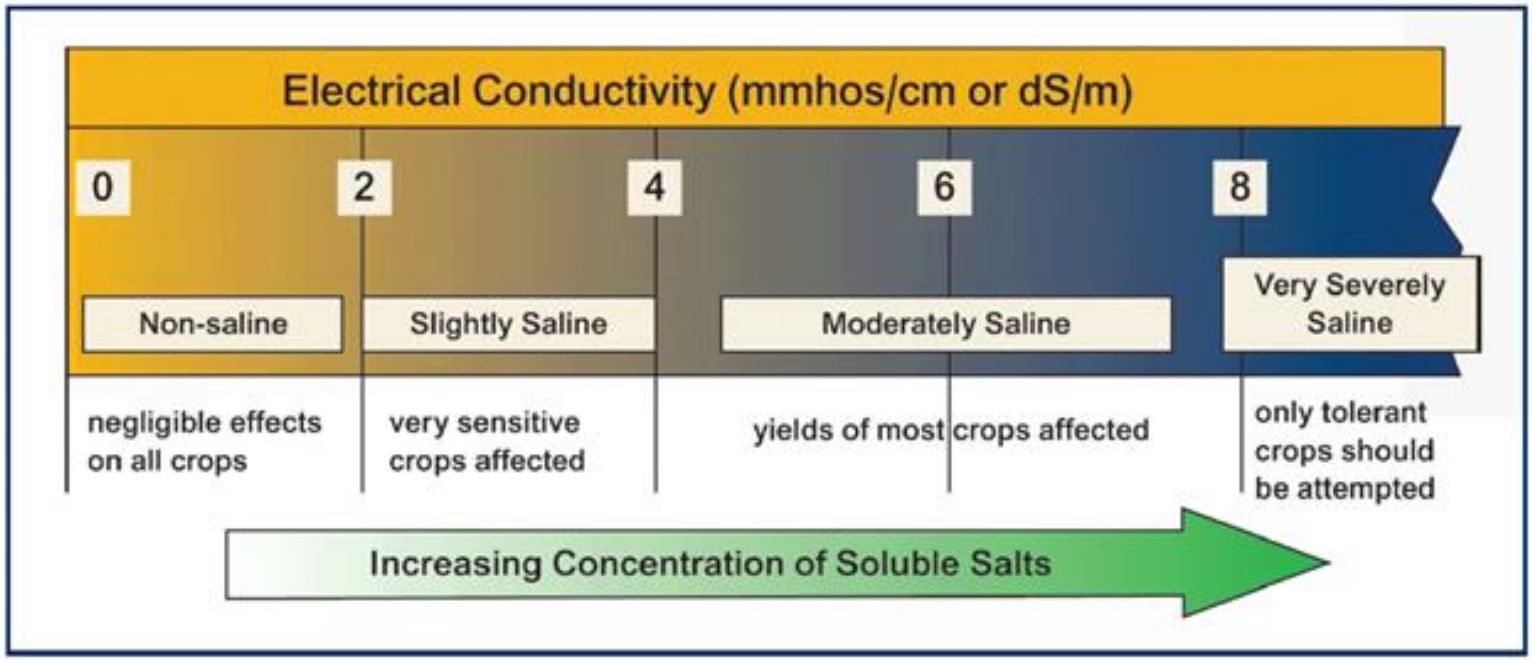
Scenario #09

A. *Flooding*
B. *Crop circle*
C. *Salinity*
D. *Leaf and Root Disease*



Crop Production Services

Measuring Soil Salinity




1. Don’t jump to conclusions …
2. Follow a process …
3. Be able to defend your conclusions … !