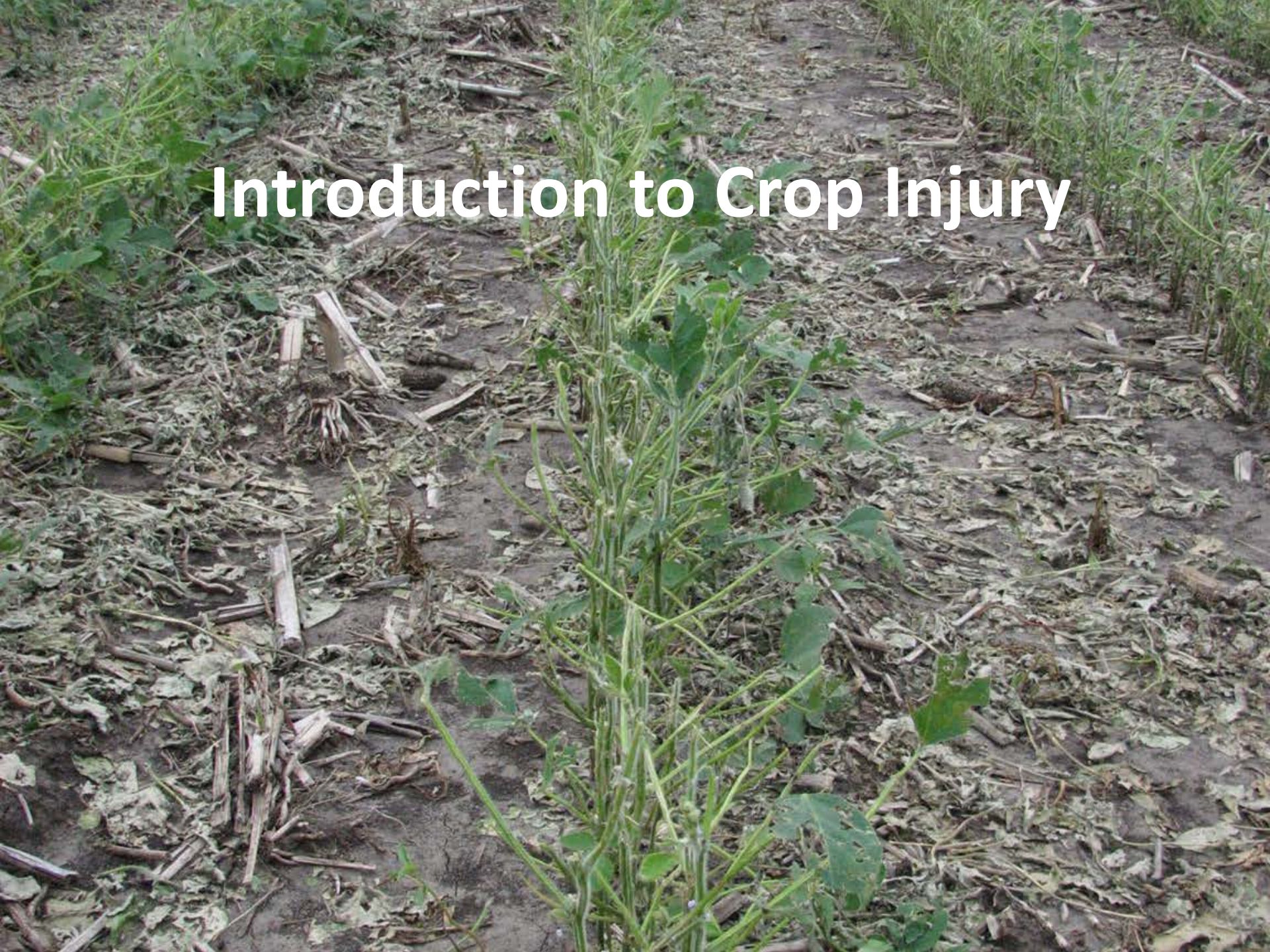
Introduction to Crop Injury

Outline

- What is a noninfectious disorder?
- Differences between noninfectious disorders and disease
- Symptoms and what to look for in the field
- Types of disorders:
  - Environmental
  - Nutrient deficiency
  - Chemical injury
  - Mechanical injury
- Other problems

Noninfectious disorders

- Nonliving agents or factors
- Caused by any physical or chemical component of the environment that is harmful to the plant's growth and development
  - Environmental conditions
  - Improper soil nutrient levels
  - Toxic chemicals
  - Mechanical damage

Differences between noninfectious disorders and plant diseases

- Noninfectious disorders do not reproduce or spread from plant to plant.
- Symptoms may appear suddenly and often occur in patterns.
- Although symptoms on individual plants may change by becoming progressively better or worse, the area of a field that is affected will not increase over time.

Symptoms

- Wilting, stunting, yellowing, plant tissue deformation or death of plant tissue
- Symptoms of noninfectious disorders often resemble those caused by infectious diseases.
  - For instance, nutrient deficiency symptoms may resemble symptoms of root rot diseases.
  - Herbicide injury on soybean leaves may resemble virus-like symptoms.

Symptoms and what to look for

- Patterns in the field
  - Does it occur in a straight line or other shape?
  - Only in low spots?
- Timing
  - Did symptoms show up after herbicide application?
  - After certain weather events?
- Other plants
  - How do surrounding plants appear?

Environmental conditions

- Water damage
  - Drought
  - Flooding
  - Soil crusting
- Temperature extremes
  - Frost
  - Heat stress

Environmental conditions

- Other weather issues
  - Hail
  - Wind
  - Lightening
- Additional concerns
  - Green stem
  - Sunburn or sunscald

Nutrient problems

- Macronutrients – most significant for plants
  - Nitrogen
  - Phosphorus
  - Potassium
- Micronutrients – secondary, plants need less
  - Iron
  - Magnesium
  - Sulfur
  - Zinc

Chemical injury

- Fertilizers may harm plants by
  - Vapors
  - Broadcast applications
  - Banding applications
- Herbicide injury happens several ways
  - Drift
  - Carryover
  - Misapplication
  - Tank contamination

Chemical injury

- Plant tissue damage from herbicide may show:
  - Scorched or burned leaves
  - Yellowing
  - Delayed emergence
  - Leaf cupping
  - Malformed or damaged roots
  - Stunting
  - Defoliation
  - Death

Mechanical injury

- Plant damage caused by equipment driving in the field
- Heavy equipment can compact soil, creating less than ideal growing conditions
- Improper combine settings during harvest may damage grain and increase harvest loss

Other problems

- Plants stressed by noninfectious disorders may be more prone to attack by infectious diseases.
  - For example, soybean plants stressed by herbicide injury may be more prone to root rot diseases.
- Problems may occur in combination, so when diagnosing a problem all possible causes or combinations of causes must be carefully considered.

Conclusions

- There are many different types of noninfectious disorders; the symptoms of some may be confused with those of infectious crop diseases.
- Proper identification is important in making informed management decisions – herbicides, fungicides, and insecticides will not help when dealing with noninfectious disorders.
- Some types of injury can be remedied, and some cannot.