

## **Wheat Disease Update**

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## Session goals

- At the end of this session participants will be able to:**
- **Identify barley yellow dwarf (BYD) of small grains**
  - **Explain how BYD is transmitted and spread**
  - **State the economic loss caused by BYD**
  - **List the management strategies for BYD**
  - **Apply the knowledge learned to manage BYD during the next wheat growing season**

## Barley Yellow Dwarf (BYD)



**Widespread in Nebraska wheat fields in 2020 mostly at low levels, but at moderate to high levels in a few fields**



**A high level of  
BYD in a grower's  
field in southern  
west central  
Nebraska on May  
19, 2020**



**A moderate level of BYD in a grower's field in south central Nebraska on May 27, 2020**

- **BYD is caused by at least 7 spp. of viruses**

- **Transmitted by more than 20 spp. of aphids**



- **BYD affects wheat, barley, oats and wild and cultivated grasses**



**Wheat**

**Barley**

**Oats**

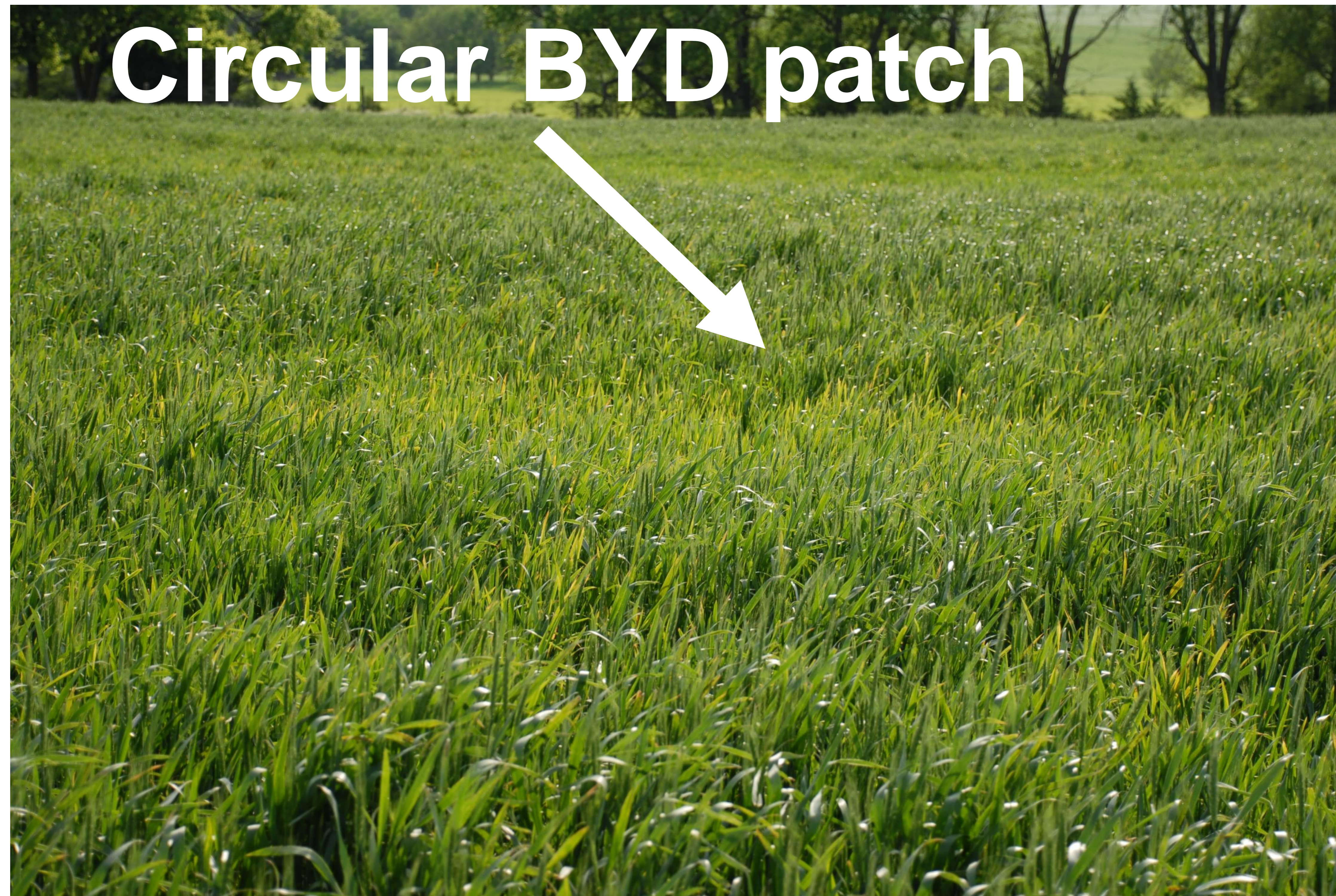
## Symptoms of BYD in wheat

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- **Leaves appear pale yellow from the tip down**
- **Tissues adjacent to the midrib remain green**
- **A red to purple discoloration may appear**
- **Infection of seedlings may result in severe stunting, delayed heading, sterility, and fewer, light-weight kernels**
- **Post-seedling infections are progressively less severe**





- **BYD patterns in the field may be random or appear as circular or angular patches reflecting aphids' patterns of movement**

## Occurrence and spread of BYD

- **BYDVs overwinter in infected winter cereals and wild and cultivated grasses**
- **Oats, barley and some wheat varieties are very susceptible; as cover crops or volunteer, they serve as a local source for migration of aphids and virus into adjacent fall planted wheat**

## Occurrence and spread of BYD

- **Aphids acquire the virus by feeding on infected plants**
- **Once acquired, the aphid carries the virus for life**
- **Virus spread in the field depends on aphid movement (active vs stationary aphids)**
- **In Nebraska, BYD epidemics are caused by passive migrations of winged aphids carried by wind from south to north**

## Occurrence and spread of BYD

- **Damaging outbreaks of BYD are favored by cool, wet seasons which favor grass and cereal growth as well as aphid reproduction and migration**
- **Average yield loss is about 5%, but up to 40% loss can occur locally depending on the variety, time of infection, environment, and the species of virus causing the infection**

## Management of BYD

- **Avoid early planting**
- **Plant resistant, avoid highly susceptible varieties**
- **Control volunteer cereals and grassy weeds**
- **Avoid planting small grain crops in midsummer as cover or companion crops**
- **Insecticide seed treatments can reduce aphid populations in the fall**
- **Foliar insecticides if aphid populations are high**

## Take-home points

- **BYD is caused by several species of viruses**
- **It affects small grain cereals and grasses**
- **It can cause up to 40% yield loss**
- **Viruses are transmitted by >20 species of aphids**
- **Viruses overwinter in infected cereals and grasses**
- **Epidemics are favored by cool, wet weather**
- **Management is through cultural practices, resistance, and insecticide treatments**

# Crop Production Clinics

**N** EXTENSION

Thank You!

Questions?

