Barley Yellow Dwarf Virus in Oats
A Field and Laboratory View

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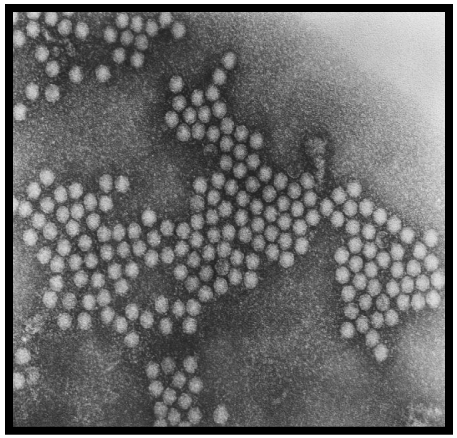
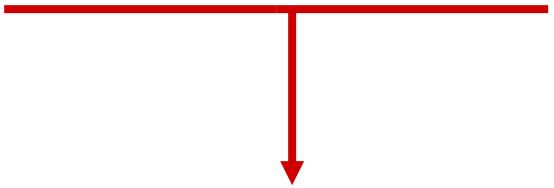
Barley Yellow Dwarf Virus in Oats: A Field and Laboratory View

- BYDV and CYDV complex is one the major oat pathogens.
- A complex of five viruses:
  - BYDV-PAV
  - BYDV-MAV
  - BYDV-SGV
  - CYDV-RPV
  - CYDV-RMV

Disease Components





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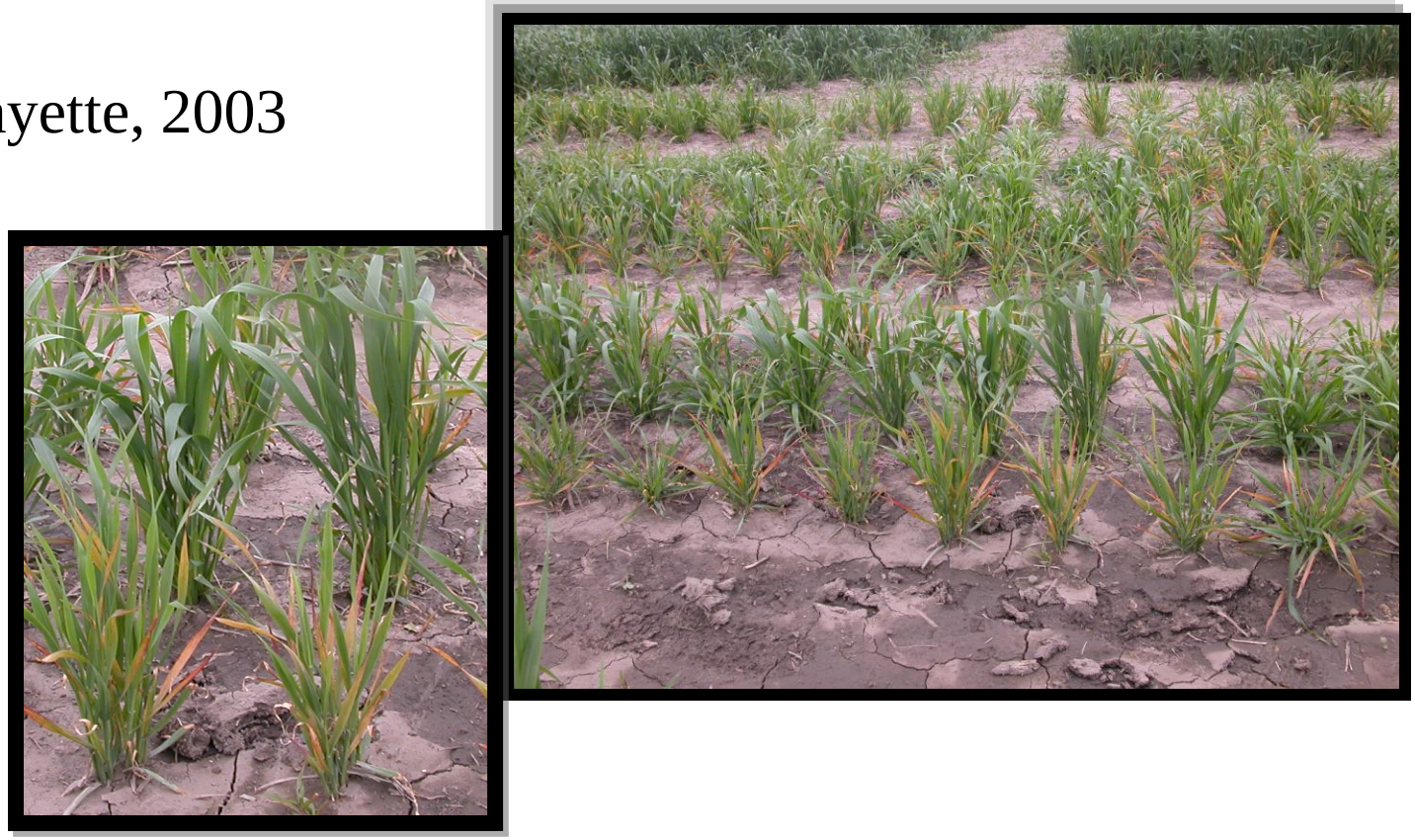
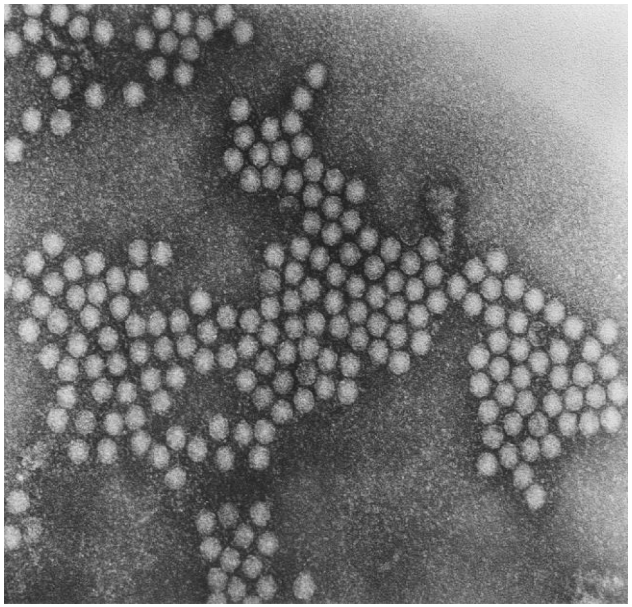
Disease Phenotypes

W. Lafayette, 2003



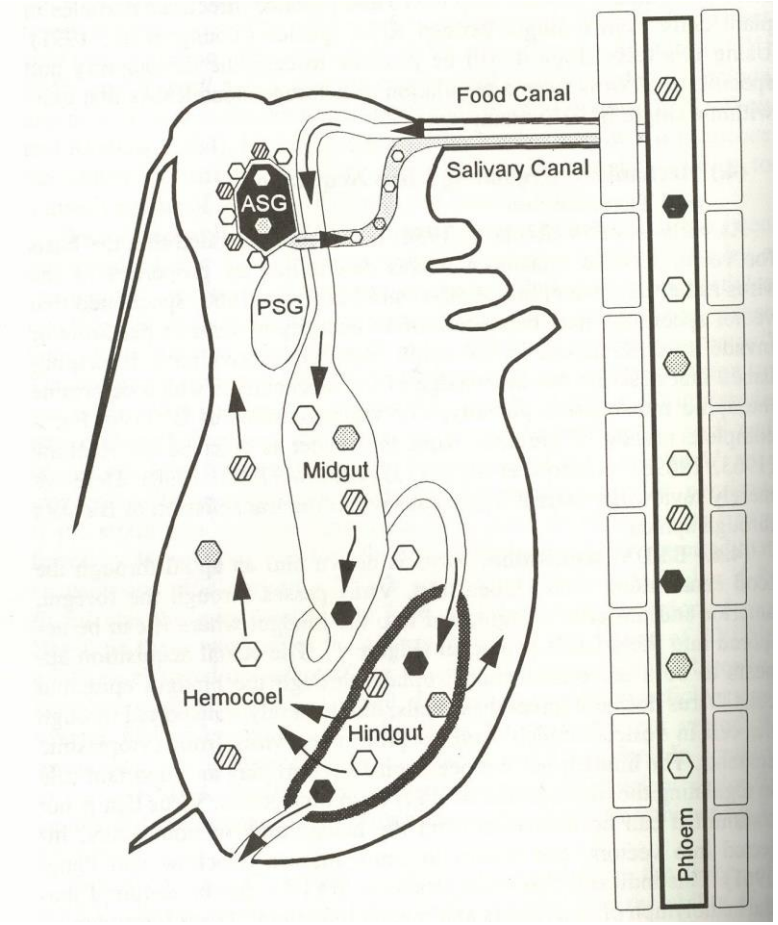
Disease Components: Virus Characteristics



- Luteoviridae Family:
  - Luteovirus (BYDV) - PAV
  - Polerovirus (CYDV) - RPV
- Single stranded plus-sense RNA
- Isometric particles
  - ~5.5 kb ssRNA, coat protein + readthrough protein
- Transmission via aphids
- Phloem or vascular tissue limited
- Host Range: wheat, barley, oats, maize, rice and annual/perennial grasses

Disease Component: Aphid

Rhopalosiphum padi (Bird cherry-oat aphid)



Circulative
Persistant
Non-propagative

Testing Oat Accessions

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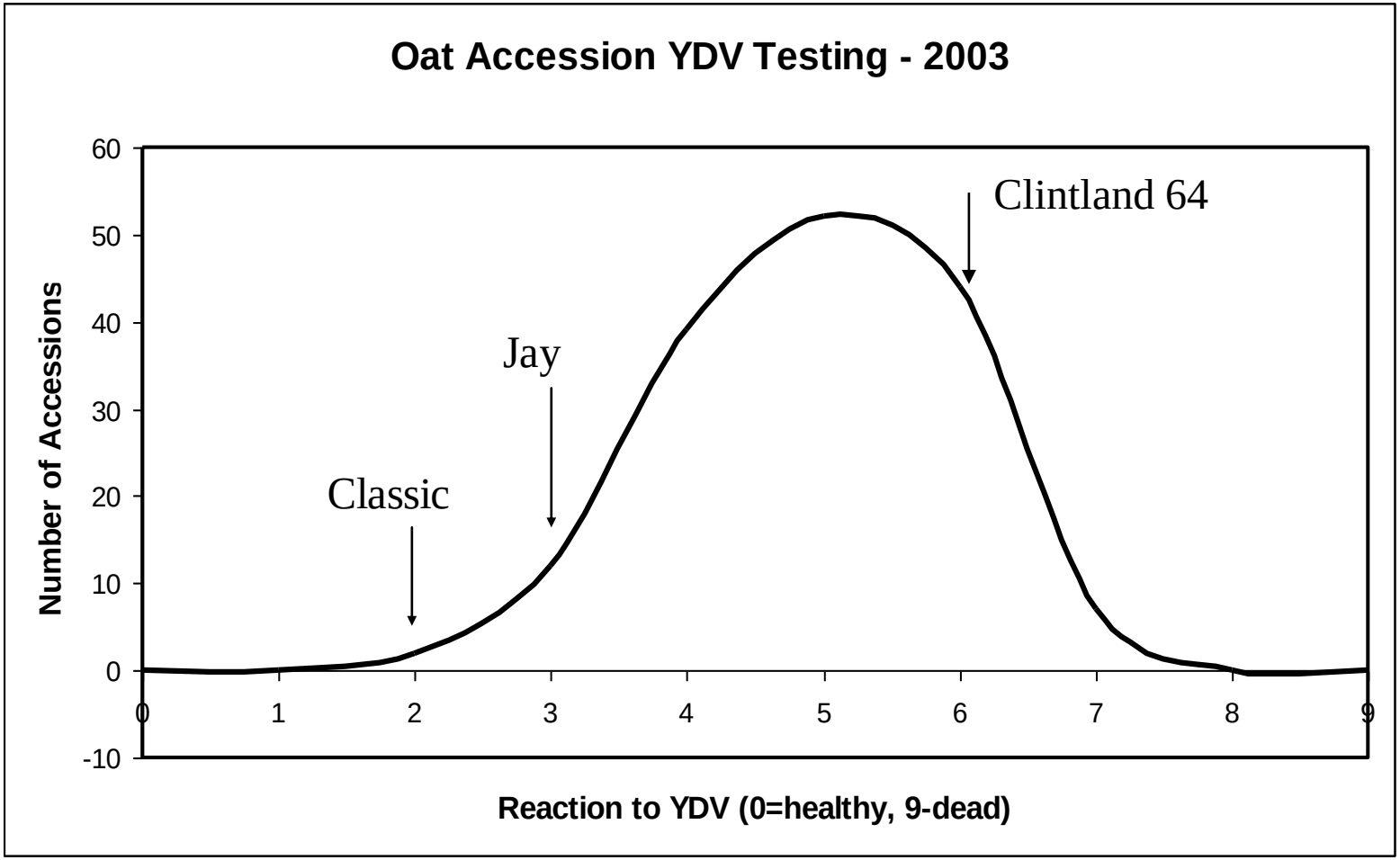
Testing Oat Accessions



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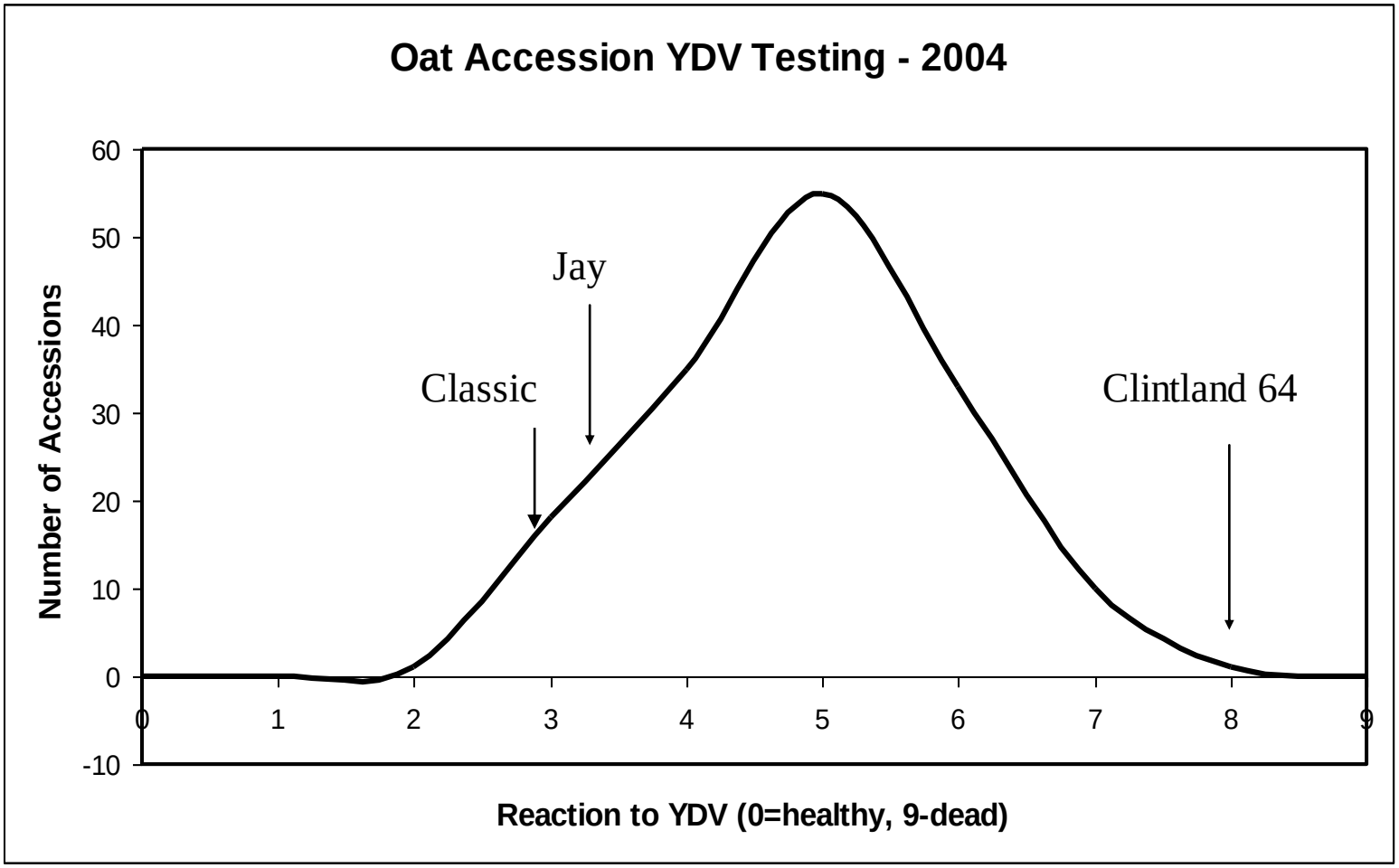

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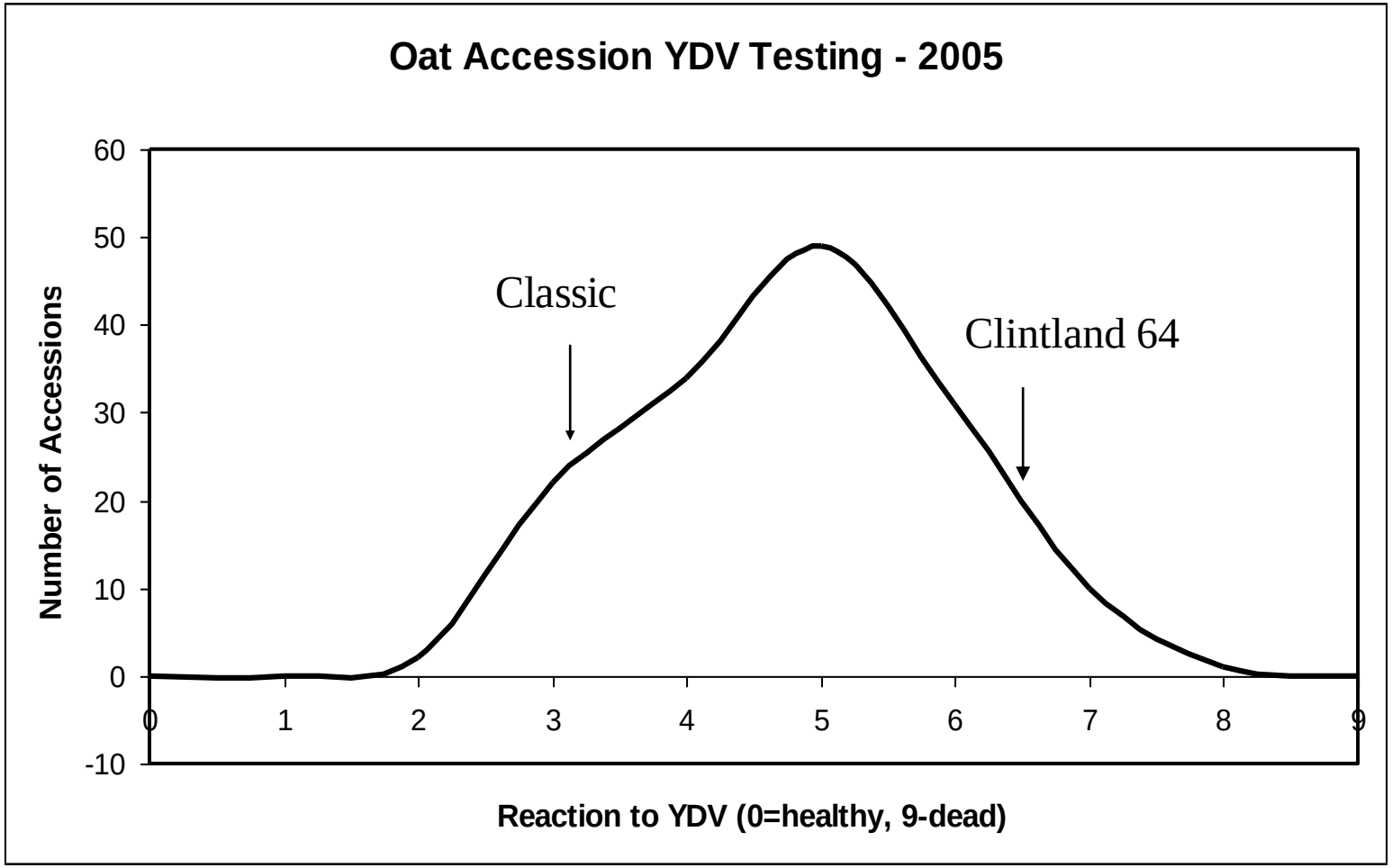
Testing Oat Accessions



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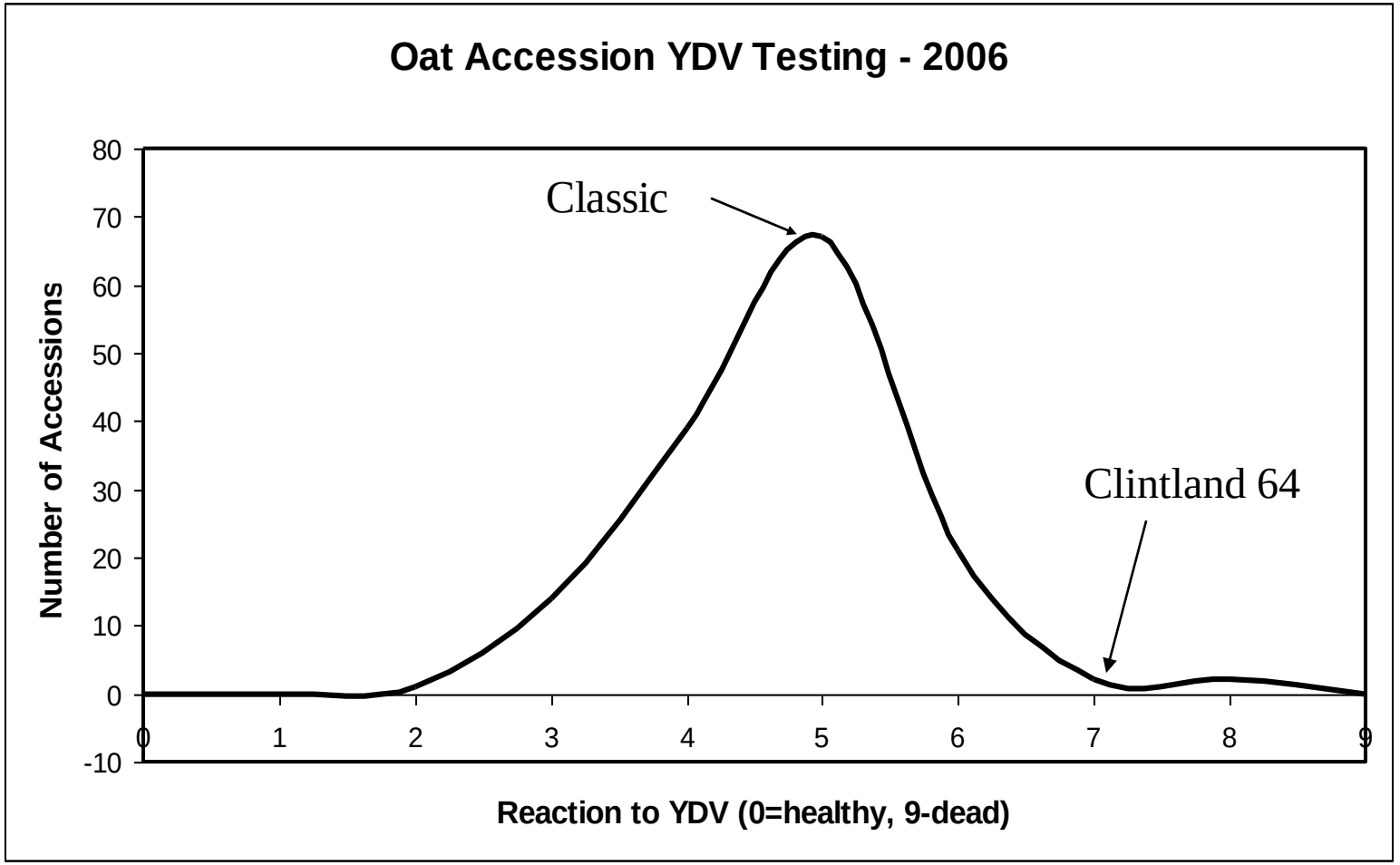

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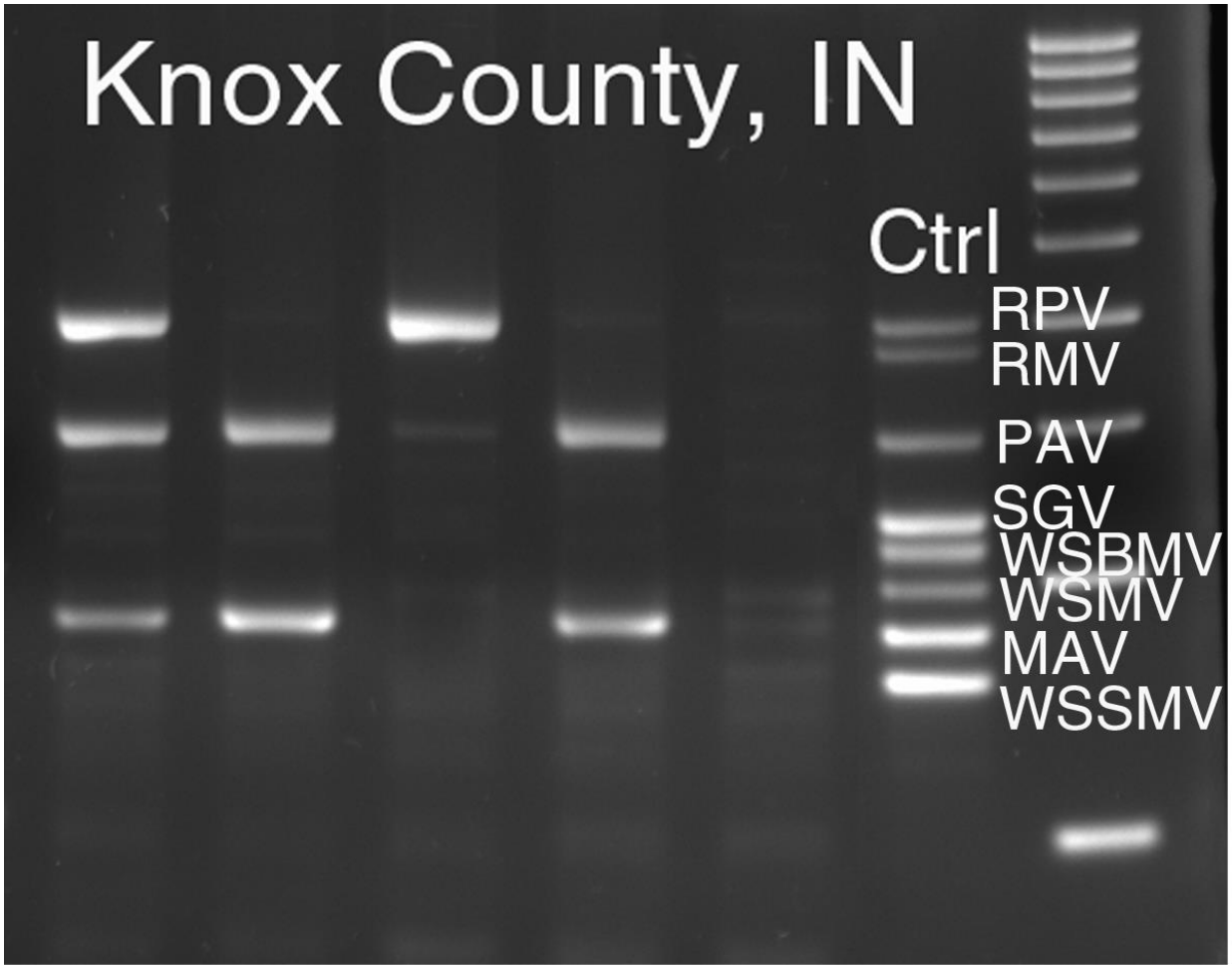
Testing for New Sources of Resistance

- Not much resistance! Mixed infection?
- Looked in GRIN for most BYDV resistant lines
  - Majority were *Avena strigosa*
  - Tested this year a set of material, many *A. strigosa*, in the greenhouse and the field

Testing for New Sources of Resistance



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Testing for New Sources of Resistance

- The most resistant material:

- Two Avena strigosa:
  - 2, 0.17
  - 3, 0.24 Std check 1.3 ELISA
- Avena brevis
  - 2.75, 0.33
- Avena sativa
  - 2.4, 0.60

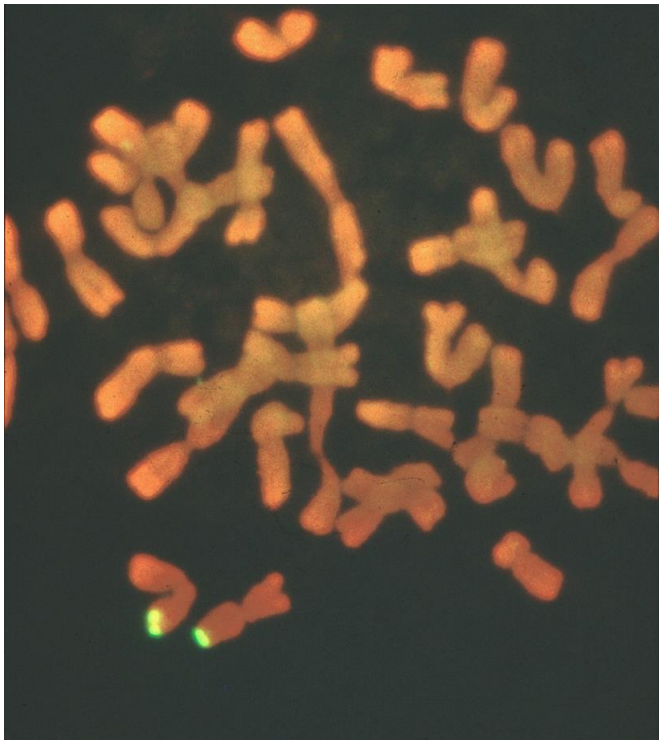
Development of YDV Resistant Wheat

Triticum aestivum
ABD

X

Th. intermedium
E^1E^2St (JJ^sSt)

→ → →



P29 - YDV Resistant Wheat

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