Wheat Streak Mosaic Virus and the Wheat Curl Mite

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WSMV Symptoms

- Yellowing with green lines or splotches (Nitrogen deficiency should not have green lines)
- Symptoms most severe on older leaves
- Younger leaves have more of mosaic symptoms
Mite-Virus Interaction

- Virus can be picked up by the mite with 10-30 minutes of feeding

- Virus remains active in the mite for 7-9 days

- Virus remains in mite from stage to stage but is not transferred to the eggs (next generation)
Wheat Curl Mite Biology

• Carrier (vector) for wheat streak mosaic virus

• Egg, 2 larval stages, and adult

• Mite is approximately 1/100 inch long (should be visible with 10x magnification)

• Cigar shaped body with forward directed legs

• Can overwinter as adults, larvae, or eggs
Wheat Curl Mite Population Dynamics

- Spread by wind---temps. of 65 F and 15+ m.p.h. wind will cause widest spread

- Populations explode with temps. in the 70’s

- Life cycle of 7-10 days with optimum temps.

- Potential for one female to produce 3 million offspring in 60 days

- Population growth slows in hot, dry conditions
Wheat Curl Mite Hosts

• Best hosts: Wheat (winter, spring, and durum)

• Good hosts: Proso Millet, Downy chess, Sandbur, Smooth Crabgrass

• Fair hosts: Corn, Western Wheatgrass, Cheat, Japanese chess

• Poor hosts: Barley, Rye, Barnyard grass, Foxtail
Wheat Curl Mite Survival

• Must be in contact with green tissue of suitable host to survive

• Survive only 8 hrs. at 75 F without food or water

• Tend to be in protected areas of the plant

• Insecticides/miticides not effective because mites are in protected areas of plant and extremely fast rate of increase in populations
Virus Susceptibility

- **High:** Wheat

- **Moderate:** Barnyard grass, stinkgrass, witchgrass, green foxtail

- **Slight:** Barley, oats, rye, sorghum, foxtail millet, proso millet, jointed goatgrass, downy brome, Japanese brome, cheat grass, sandbur, crabgrass

- **Resistant:** Most corn hybrids, Canada wildrye, yellow foxtail
WSMV Management: Volunteers

- Control winter wheat and spring wheat volunteers and grass weeds with herbicides/tillage ("break the green bridge")

- Control at least 2 weeks prior to planting

- Mites do not survive on dead tissue
WSMV Management: Planting Date

- **Winter Wheat**: plant toward end of window; early planting at higher risk with warmer temps. and higher mite activity

- **Spring Wheat/Durum**: plant early before mite populations build up in winter wheat or volunteers and moves into spring grain

- If mite moves into HRSW at flag leaf or later yield loss is minimal
WSMV Management: Varieties

• **AC Radiant**- Lethbridge, Alberta Canada winter wheat 2007 release; resistant to mite
  [http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex11601](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex11601)

• **Mace**- USDA ARS and Nebraska Ag. Exp. Station hard red winter wheat 2007 release; resistant to the virus