Managing Rhizopus Head Rot with Fungicides

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Rhizopus Head Rot

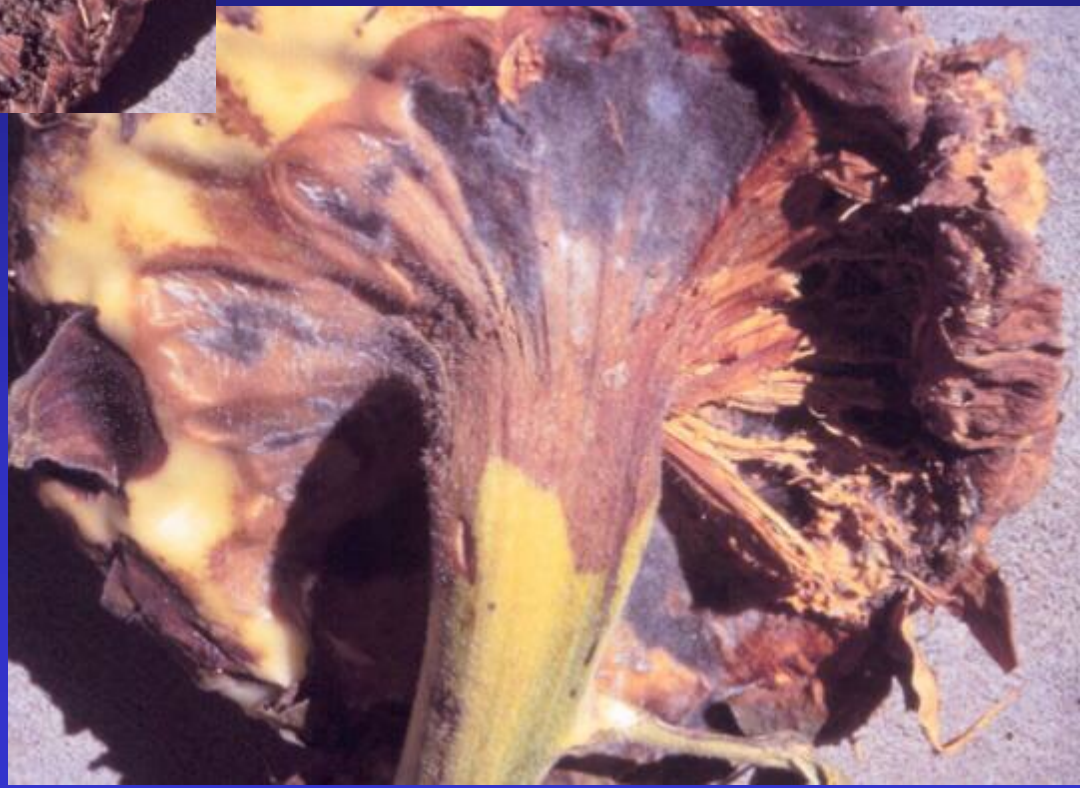
- Caused by several fungal pathogens: *Rhizopus arrhizus*, *R. stolonifer*, and *R. microsporus*
- Overwinters in soils and opportunistically infects through wounds under conditions of high humidity and warm temperatures
- Capable of causing serious yield losses

Signs and Symptoms

- Dark spots on back of ripening heads
- Watery soft rot that turns dark with age
- Grayish, fuzzy fungal growth seen on flower side of head
- Heads dry prematurely, and become shredded
- Disease severity and spread increased by wounds - summer storms/hail, insects, and birds

Hail Damage and Infection

Hail Damage Initiates Infection



Seed Drop – Hail, Insect, Bird

Collaborative Studies

- Over last 10-15 years –studies have been conducted on several sunflower diseases – disease management and yield losses
- Sam Markell, Febina Mathew, Bob Harveson – multiple graduate students and technicians
- NDSU, SDSU, and UNL
- Rust, Phomopsis, and Rhizopus Head Rot

Purpose of the Rhizopus Head Rot Project

- In 2016, it was problematic in North Dakota, South Dakota, and Minnesota
- More commonly seen in CHP – Nebraska, Colorado, and Kansas
- Induce disease and document the potential damage to both oil and confectionary sunflower yields under field conditions
- Multiple geographically and environmentally different locations within sunflower production areas of the Great Plains

Studies in NE and SD - 2024

- NE had 7 treatments, and SD had 9
- NE - tested 4 fungicides and 2 copper alternative products applied about 10 days after inoculation (R6)
- SDSU - tested 3 fungicides at two application timings (R3 and R5 – two days after inoculation)

Methodology

- Plots established in South Dakota, and Nebraska – planted in May
- Plots 4 30 inch rows – 25 ft in length
- NE – confectionary type and sprinkler irrigated
- SD – oil type and rainfed (dry-land)
- Inoculated mid-August (10 plants per plot)
- Disease ratings – late September to mid-October
- Harvest late October

Disease Ratings 0-4

- 0 = no signs or symptoms of disease
- 1 = 1-25% of head affected
- 2 = 26-50% of head affected
- 3 = 51-75% of head affected
- 4 = 76-100% of head affected

Rating of 1

Rating of 2

Rating of 3 (left) and 4 (right)

Nebraska Results 2024

	Disease	Yield (lbs)
Control	97.5a	0.51a
SaniDate	100.0a	0.67a
Folicur	100.0a	0.46a
Topsin	100.0a	0.76a
Life Guard	100.0a	0.56a
Endura	97.5a	0.79a
Priaxor	97.5a	0.66a

South Dakota Results 2024

	Disease	Yield (lbs)
Control	69.0a	0.69a
Headline R3	69.0a	0.82a
Folicur R3	67.5a	0.84a
Ridomil R3	67.5a	0.77a
Endura R3	66.0a	0.86a
Headline R5	65.0a	0.76a
Folicur R5	62.5a	0.91a
Endura R5	62.5a	0.83a
Ridomil R5	59.5a	0.89a

Summary and Conclusions

- Techniques to establish and evaluate disease are well-established and produce consistent results
- In 2024, there were no significant differences in disease severity index and yield
- Numerical differences in SD (Ridomil) has led us to propose a continuation of this project using this product in both Nebraska and South Dakota for a fourth and final year

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Questions?