

Screening Sunflowers for Head Rot Resistance

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The current cycle of high rainfall has resulted in severe outbreaks of sclerotinia head rot (white mold) in many sunflower production areas. This disease not only reduces yield, but also produces overwintering bodies (sclerotia), which contaminate grain or remain in the field to serve as disease inoculum for subsequent crops in the rotation. Virtually all broadleaf crops in the Northern Plains are susceptible to sclerotinia.

With grant funding from the National Sunflower Association and the State Board of Agricultural Research and Education and fees assessed for evaluating commercial hybrids, a long-term head rot screening nursery was established at the NDSU Carrington Research Extension Center in 2000. The nursery consisted of three areas: 1) 82 commercial hybrids (three replicates of each hybrid), 2) 216 germplasm entries from the USDA-ARS Sunflower Research Unit in Fargo, and 3) an area for refining the methodology of conducting a head rot screening nursery. To insure favorable conditions for disease development, individual plants (10/plot) were artificially inoculated and a misting system was designed and constructed to maintain a humid environment.

A very satisfactory level of disease pressure was achieved. Head rot was evaluated when significant disease was observed in the plots and again two weeks later. Initial analysis of the data showed a range from slightly susceptible to very susceptible. These data will guide plant breeders in the selection of germplasm for use in crosses to develop more resistant hybrids. In future years, the results may also serve as a guide for producers in selecting hybrids to plant. Methodology work will continue to study ways to increase the efficiency and effectiveness of the nursery, such as: the best source of inoculum, stage of head development for inoculation, duration of misting after inoculation, minimum number of replicates and plants / replicate, use of tall border plants to reduce drying and mist drift due to wind, etc.