

SPREADING OF CEREAL CYST NEMATODE WITH POTATO SEED TUBERS IN SAUDI ARABIA

A.A.M. DAWABAH* AND A.S. AL-HAZMI

Plant Protection Department, College of Food and Agricultural Sciences,
King Saud University, P.O. Box 2460 m Riyadh 11451, Saudi Arabia

*E-mail: dawabah@hotmail.com

Cereal cyst nematode, *Heterodera avenae* Wollenweber, 1924, is the most important pest and limiting factor of wheat and barley production in Saudi Arabia (Al-Hazmi *et al.*, 1999; Ibrahim *et al.*, 1999). The nematode was first reported from Al-Bakiriah, Gassim region in 1987 (Youssef, 1987). Since then, it has been spreading in wheat fields in the Kingdom, as it has been frequently encountered in 52-90 % of the total soil samples collected from wheat fields in the three major wheat producing regions located in Riyadh, Gassim and Hail (Al-Hazmi *et al.*, 1994). The pathotype of the nematode was then identified as pathotype Ha21 (Al-Hazmi *et al.*, 2001).

Some of the infested wheat fields are rotated with potato in Saudi Arabia. We have found *H. avenae*, in few samples from newly-cultivated or non-infested wheat fields which, had been previously cultivated with potato seed tubers produced in nematode-infested fields. Accordingly, 20 soil samples, 100 g each, were collected from the soil adhering to potato seed tubers stored in potato storage (3° C) for two years. Hundred potato bags were randomly chosen in the storage, and the potato seed tubers were gently brushed to collect the adhering soil particles. Soil samples were processed for nematode and cyst extraction by sieving and floatation method (Barker, 1985; Shepherd, 1986).

Vermiform nematodes were then identified to the generic level (Mai *et al.*, 1968), while nematode cysts were identified following the key of Mulvey & Golden (1983) and Golden (1986). Results showed that *H. avenae* eggs, juveniles and cysts were, indeed, found in ten of the collected soil samples (absolute frequency=50%), and the stunt nematode, *Tylenchorhynchus* sp., were found in 8 samples (absolute frequency = 40%). The mean nematode population density per 100 g of the positive samples was: *Tylenchorhynchus* (90); *H. avenae* cysts (5 cysts).

Our finding demonstrate that planting such contaminated potato seed tubers in our wheat fields would introduce and spread *H. avenae* to the wheat fields where, the susceptible wheat cv. "Yecora Rojo" is usually cultivated. These findings also support an earlier report by Smiley (2005) who indicated that cereal cyst nematode, *H. avenae*, can be spread to non-infested areas on soil carried on equipments, animals, shoes, plant roots, or tubers as well as by wind (in dust) and water.

References

- Al-Hazmi, A.S., Al-Yahya, F.A. & Abdul-Razig, A. T. (1999). Damage and reproduction potentials of *Heterodera avenae* on wheat under outdoor conditions. *J. Nematol.*, 31: 662-666.
- Al-Hazmi, A.S., Cook, R. & Ibrahim, A.A.M. (2001). Pathotype characterization of the cereal cyst nematode, *Heterodera avenae*, in Saudi Arabia. *Nematology*, 3: 379-382.
- Al-Hazmi, A.S., Ibrahim, A.A.M. & Abdul-Razig, A.T. (1994). Occurrence, morphology and reproduction of *Heterodera avenae* on wheat and barley in Saudi Arabia. *Pak. J. Nematol.*, 12: 117-129.
- Barker, K.R. (1985). Sampling nematode communities, 3-17 pp. In: *An Advanced Treatise on Meloidogyne Vol. II. Methodology*. (Eds.) K.R. Barker, C.C. Carter & J.N. Sasser. A Coop. Publ. Dept. Plant Pathol. USAID, North Carolina State University Graphics, Raleigh, USA.
- Golden, A.M. (1986). Morphology and identification of cyst nematodes. 23-45 pp. In: *Cyst nematodes*. (Eds.) F. Lamberti and C.E. Taylor. Plenum Press, New York.
- Ibrahim, A.A.M., Al-Hazmi, A.S., Al-Yahya, F.A. & Alderfsi, A.A. (1999). Damage potential and reproduction of *Heterodera avenae* on wheat and barley under Saudi field conditions. *Nematology*, 1: 625-630.
- Mai, W.F., Lyon, H.H. & Kruk, T.H. (1968). *Pictorial key to genera of plant parasitic nematodes*. Third Revision. New York State College of Agriculture, Cornell University, Ithaca, New York.
- Mulvey, R.H. & Golden, A.M. (1983). An illustrated key to the cyst-forming genera and species of Heteroderidae in the Western Hemisphere with species morphometrics and distribution. *J. Nematol.*, 15:1-59.
- Shepherd, A.M. (1986). Extraction and estimation of cyst nematodes. 31-49 pp. In: *Laboratory Methods for Work with Plant and Soil Nematodes*, (Eds.) J. F. Southey, Ministry Agric., Fish and Food, Her Majesty's Stationary Office, London.
- Smiley, R.W. (2005). Plant parasitic nematodes affecting wheat yield in the Pacific Northwest. Oregon State University Extension Service. *Series # EM 8887*, 4 pp.
- Youssef, G.M. (1987). Effect of *Heterodera avenae* populations in infested field patches of wheat cultivation on plant growth and yield. *Tenth Symposium on the Biological Aspects of Saudi Arabia*, 20-24 April, 1987. Jeddah, Saudi Arabia, 183 pp. [Abstr.]