ANGUINA TRITICI

IDENTITY: Scientific name *Anguina tritici*
(Steinbuch, 1799) Chitwood, 1935
Common name: Wheat seed gall nematode

NOTES ON TAXONOMY AND BIOLOGY: *Anguina tritici* female show a well developed anterior branch of the ovary which is folded in two or more flexures and a conoid tail, tapered to an obtuse or round tip (Southey, 1972). This species is closely related to *A. funesta* and *Subanguina wevelli*. The morphological separation of these three species is difficult. Recent molecular diagnostic techniques have facilitated the separation of these three species (Riley et. al., 1988; Powers et al., 2001). J2 emerge from the seed galls in the soil and crawl onto the newly germinated seedlings. They establish infection sites between young leaves where they feed as an ectoparasite causing leaf distortion and crinkling. Later, they penetrate the flower buds at the time of flower bud initiation. J2 stimulate the formation of galls in floral tissues in place of seed development. Juvenile development is completed inside the galls. Newly formed females deposit eggs, which hatch producing J2, which remain, encased in the galls (cockle) and perpetuate plant infection in following years. Dried cockles are harvested with developed seeds. *Anguina tritici* vectors a bacterium *Clavibacter tritici*, which is the causal agent of yellow ear rot or 'tondu' of wheat. Freshly harvested infected wheat cockles containing the bacterium are toxic to cattle and sheep (Anwar et al., 2001).

GEOGRAPHICAL DISTRIBUTION: Reported from Afghanistan, Australia, Brazil, Bulgaria, China, Egypt, Ethiopia, Hungary, India, Iran, Iraq, Israel, Lithuania, New Zealand, Pakistan, Poland, Romania, Russian Federation, Russian Far East, Syria, Switzerland, Turkey, and Yugoslavia. Early records of nematode detection in the US include California, Georgia, Maryland, New York, North and South Carolina, Virginia and West Virginia. Recent surveys of the wheat seed gal nematode in stored grain harvested from states with records of this nematode have not provided any evidence that nematodes are still occurring in the US (CAB International, 2001).

HOSTS: Emmer (*Triticum monococcum*), rye (*Secale cereale*), spelt (*T. spelta*), and wheat (*T. aestivum*). Barley (*Hordeum vulgare*) is a very poor host. There is no evidence this nematode reproduces on oats (*Avena sativa*) and other grasses.

CROP LOSSES: Nematode damage is negligible in countries adopting modern mechanical and cleaning procedures to separate the nematode galls from visible wheat seeds. The use of high quality seeds has nearly eradicated this nematode from developed countries. However, the nematodes causes severe crop losses to rye (35- 65%) and wheat (20-50%) (Anwar *et al*, 2001; Leukel, 1929, 1957) in 3rd world countries, where poor agricultural practices, monoculture, and the use of poor quality seeds are widespread. In spite of the insignificant damage caused by the nematode in modern agricultural production systems of developed countries, their ability to export grains in the international markets is severely hampered if historical records still exist of the presence of this pest in grain production areas due to the quarantines imposed by many countries because of this pest.

MEANS OF MOVEMENT AND DISPERSAL: Through the characteristic dark seed galls harboring the nematode juveniles in harvested grains.

RATING: (H) The nematode is a damaging pest in 3rd world countries. It is a pest of major regulatory significance in developed countries; see comments in the section on crop losses.
Taking into consideration the large production of wheat and rye in the US and the regulatory impact on

grain export, this nematode deserves a high priority rating for a complete risk assessment.

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