Seed borne pathogens

Nematodes

Tylenchida

Superfamily Criconematoidea

- **Family *Criconematidae* (*Criconemoides*, *Criconema*)**
- **Family *Tylenchulidae***

Superfamily Tylenchoidea

- **Family *Tylenchidae* (*Tylenchulus*)**
- **Family *Anguinidae* (*Anguina*, *Ditylenchus*)**
- **Family *Dolichodoridae* (*Dolichodorus*)**
- **Family *Belonolaimidae* (*Belonolaimus*)**
- **Family *Pratylenchidae* (*Pratylenchus, Radopholus*)**
- **Family *Hoplolaimidae (Hoplolaimus)***
- **Family *Heteroderidae* (*Meloidogyne*, *Heterodera*)**

Ditylenchus

(Stem and bulb nematode)

1. **Migratory endoparasitic nematode**
2. **Reproduction: amphimix**
3. **Important species**
   - ***D. dipsaci*** **(Stem and bulb nematode)**
   - ***D. destructor*** **(Potato rot nematode)**
   - ***D. myceliophagus*** **(Mushroom spawn nematode)**
4. **Wide host range**
   - **8~10 host race or biotypes**
     (Oat race, Alfalfa race, Bulb race)
     onion, potato, carrot, strawberry, weeds, etc.

Ditylenchus

(Stem and bulb nematode)

5. Symptoms

- Plant; distorted, stunted, spickels, wool

- Alfalfa, clover; reduction of internode length swollen stem

- Garlic; twisted and swollen leaves

6. Control

- mixture of hot water and formalin (Garlic)

- systemic insecticide

- resistant cultivar (alfalafa)

Ditylenchus

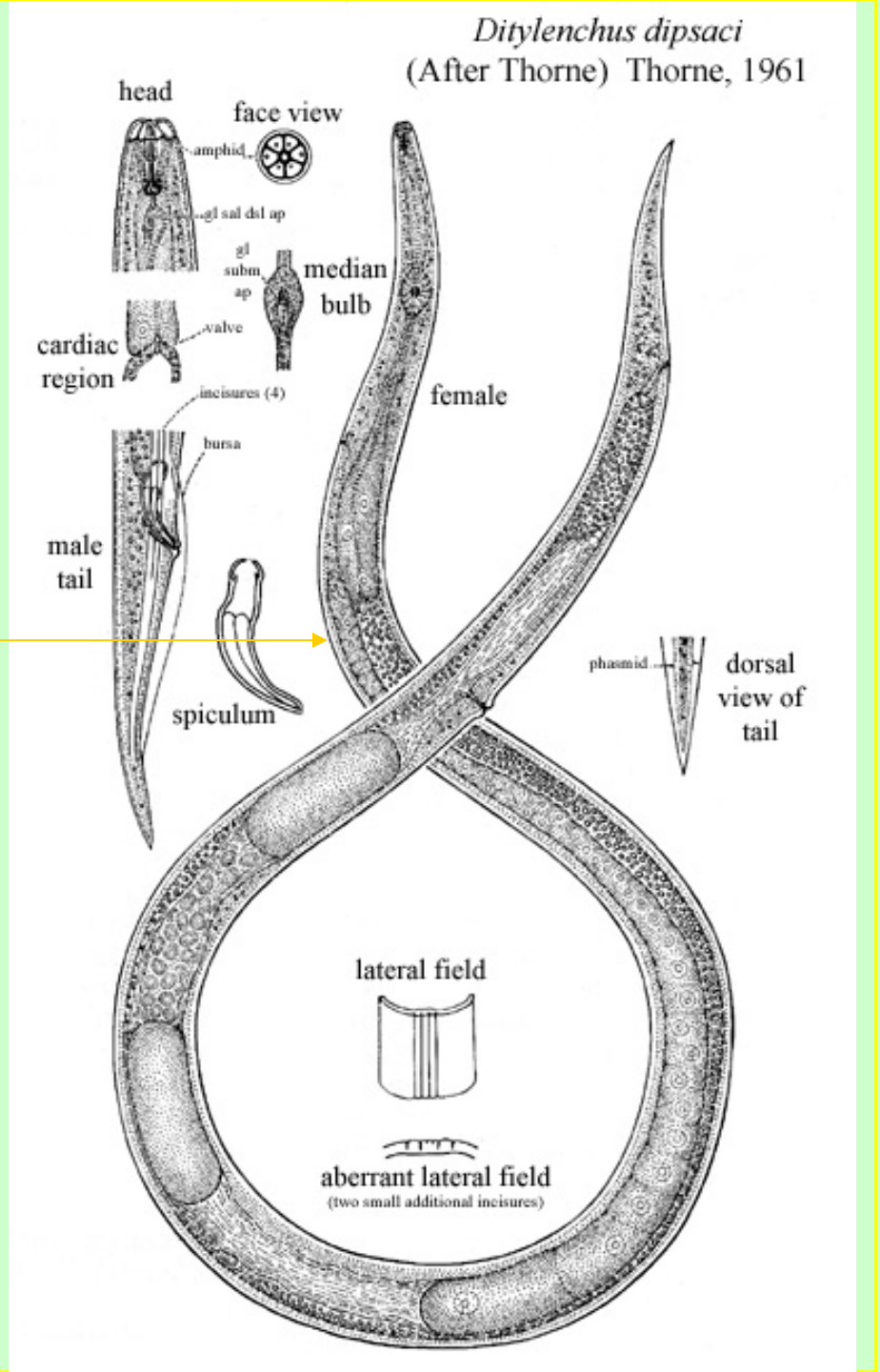
(Stem and bulb nematode)

7. J4 is diapause stage (infective stage)
- **survive in soil for 8~9 years**
- **nematode “wool”; anhydrobiotic survival**

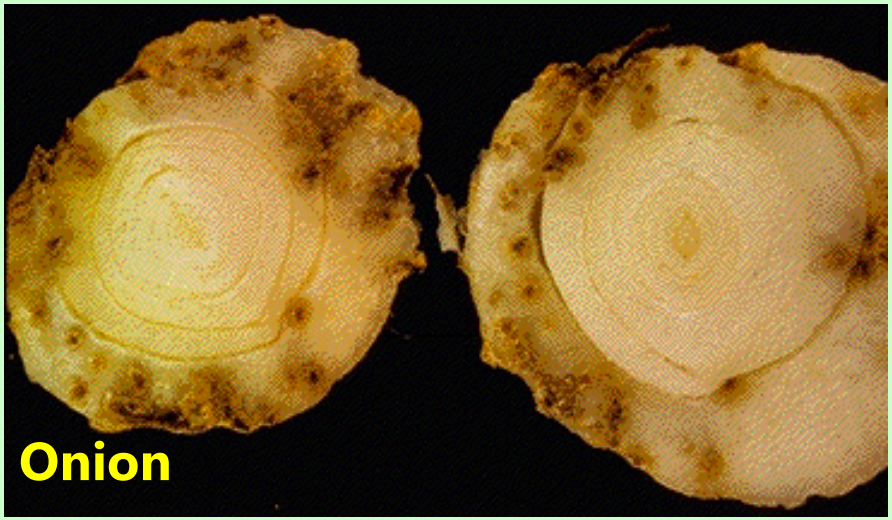
8. Morphology
- **Slender body**
- **Lip region low**
- **Head skeleton, stylet similar to *Anguina***
- **Vulva located in 2/3 of the body**
- **Sharply pointed tail**

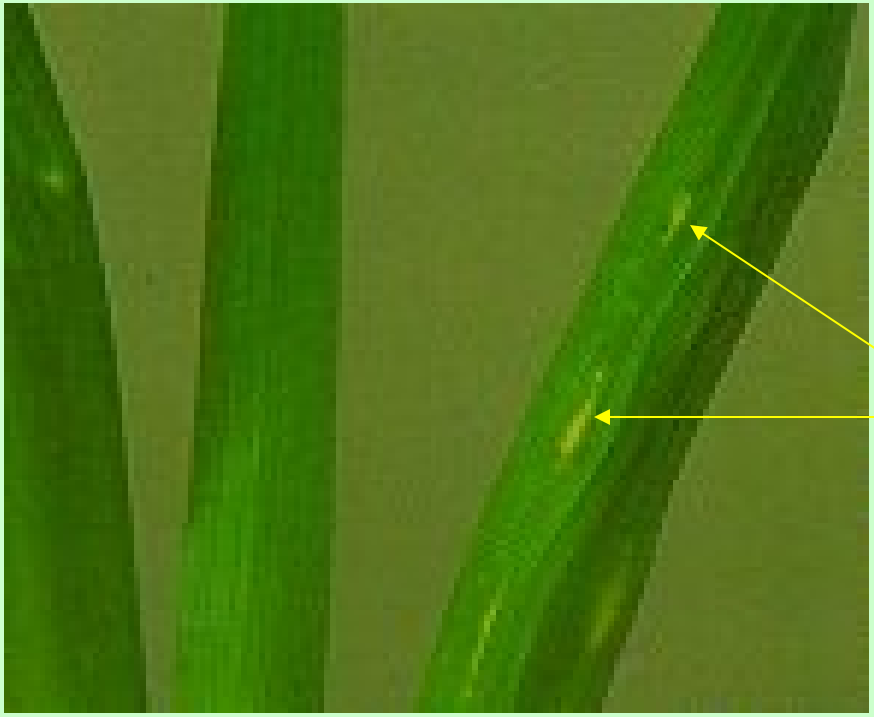
Dutylenchus dipsaci

ovary



Ditylenchus dipsaci



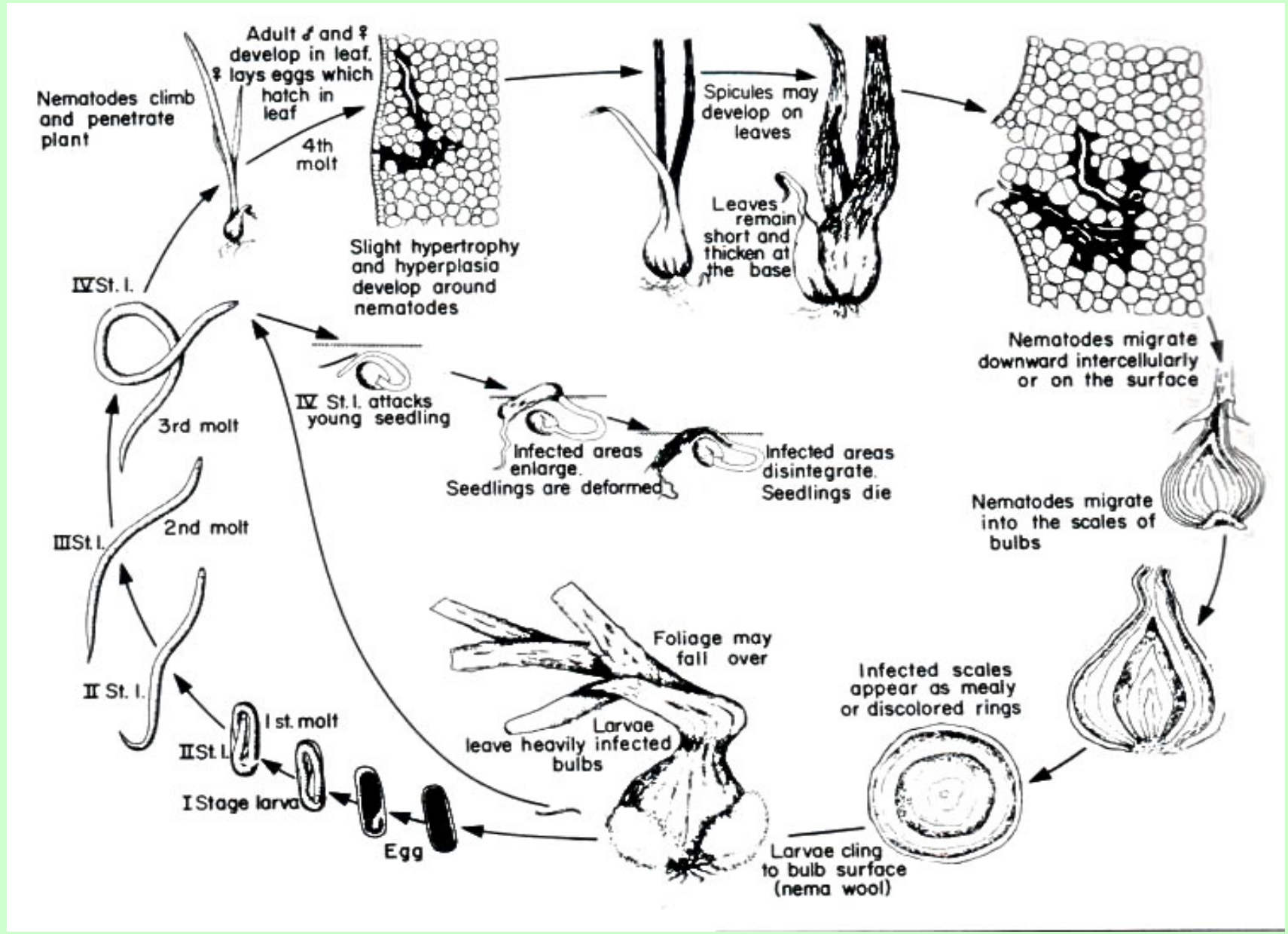


Ditylenchus dipsaci

Spickles

Ditylenchus destructor

Life cycle of *Ditylenchus dipsaci*



Anguina

(Seed gall nematode)

1. Reproduction: amphimix
2. Host: wheat, rye, grass
3. *Anguina tritici*, 1743, Needham
4. Infective stage, J2
; moves on the root and stem surface in a film of water to the stem growing tip.
(probably feed ectoparasitically leaves)

Anguina

(Seed gall nematode)

5. Gall

- formed on leaves, flower, various tissues

- dark, shorter, and thicker than normal seed

- contain female and male(1:1 ratio)

;2,000 eggs/female/several weeks

- one generation /year in seed gall

- galls fall ground, absorb water, and release J2

- survive nematode in gall up to 40 years

Anguina

(Seed gall nematode)

6. Control

- crop rotation, heat treatment(seed), resistant variety, mechanical separation

7. Morphology

- body obese

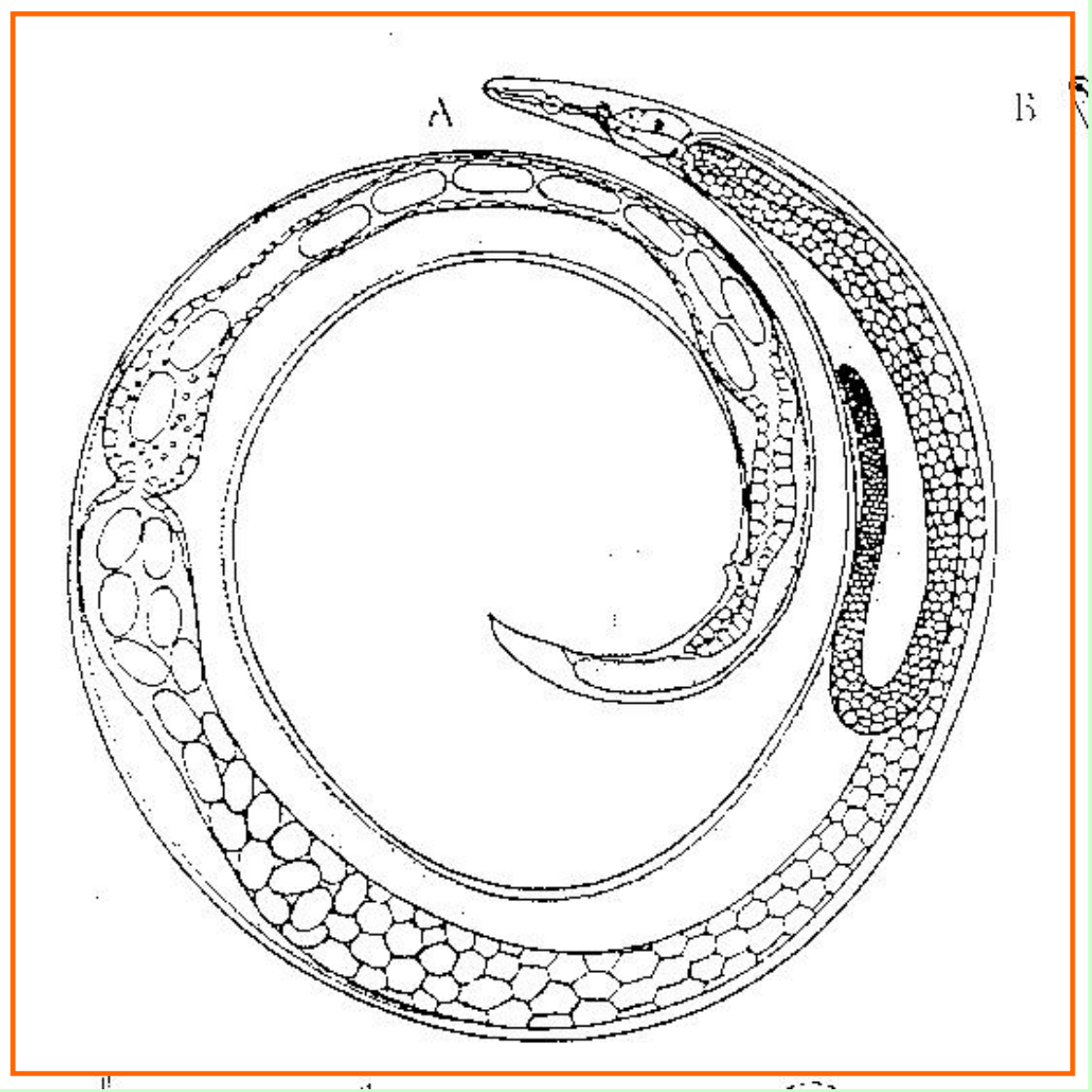
- low lip region

- female has huge gonad

:ovary reflexed once or twice

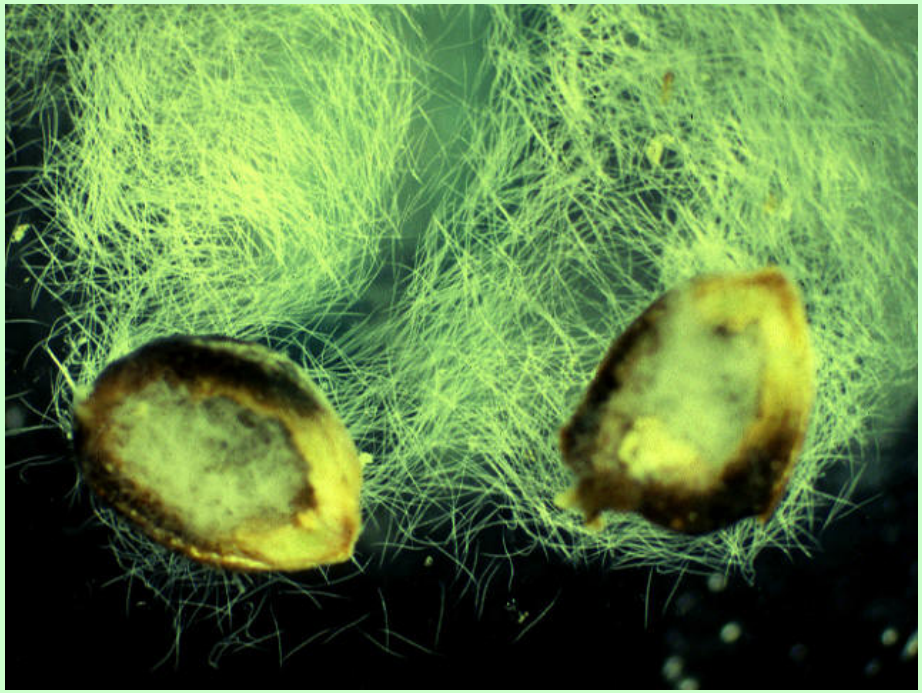
male is more slender

Anguina tritici



Anguina tritici

J2 from wheat gall

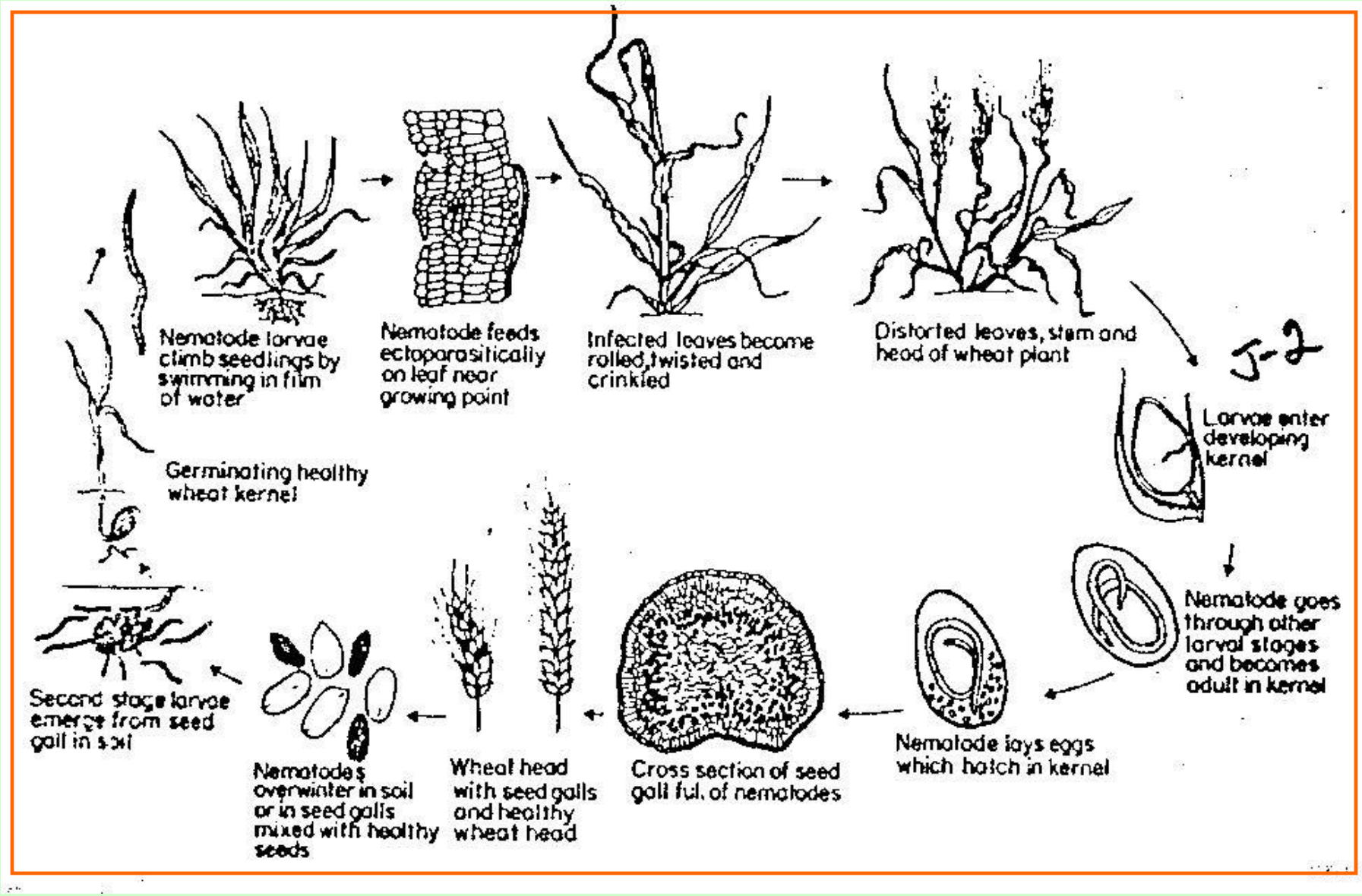


Symptoms in wheat

Anguina tritici

Healthy seed **Nematode infected seed**

Life cycle of *Anguina tritici*



Aphelenchoides besseyi

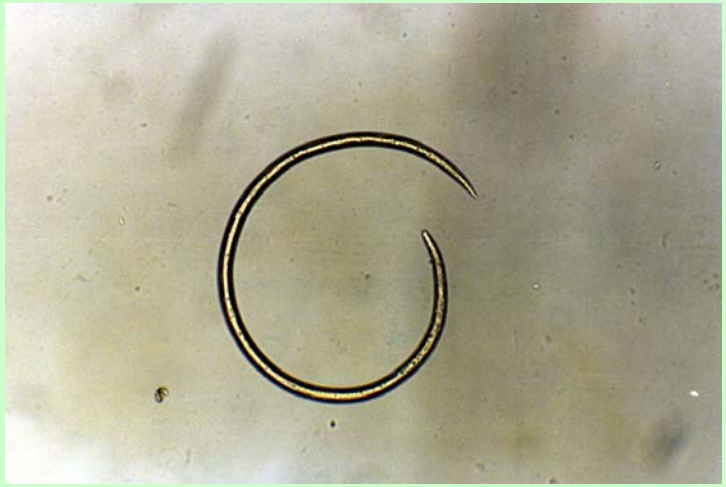
- **Incidence**
- Surveys have shown large numbers of seed lots to be infected with, and high inc idences of infection by, A. besseyi throughout the ma in rice producing areas of t he world. In Tanzania, A. besseyi was reported in 12 .8% of rice seed lots with i nfection levels ranging fro m 2 to 82% within lots (Ta ylor et al., 1972).

Heterodera glycines

- Reported yield losses on soyabean vary from 10-70 % in Japan (Ichinohe, 1955; Inagaki, 1977). All soya bean growing areas in the USA are at risk and the nematode is still spreading into previously uninfested areas. Losses in the southeastern USA were estimated at US$88.4 million in 1990 (Sciumbato, 1991). Wrather et al. (1997) provided loss estimates for the top 10 soyabean producing countries and concluded that, worldwide, H. glycines was the most important constraint on yield.

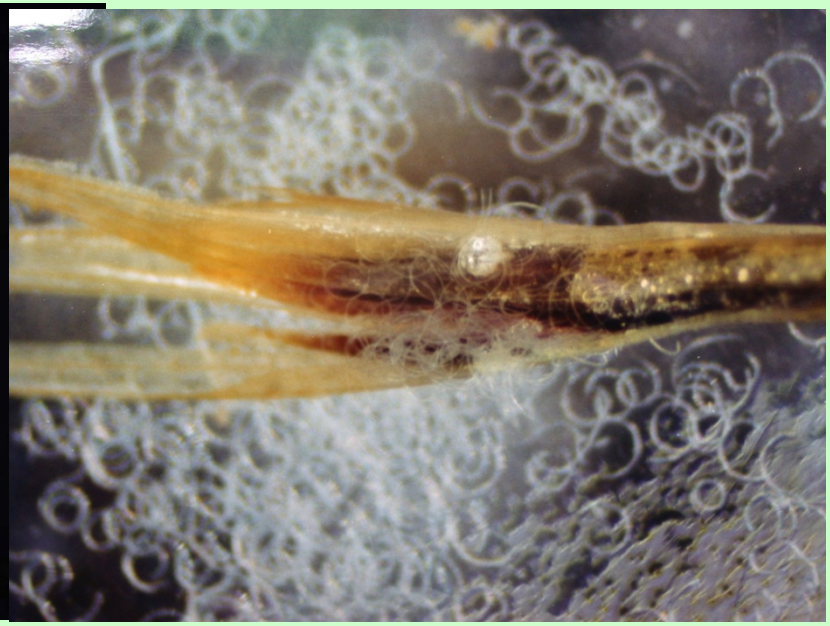
Detection of seed-borne nematode

- Baermann funnel technique
- Petridish extraction technique
- Cobb's sieving and decanting technique



Seed gall

Anguina sp.



Detection of *Aphelenchoides besseyi* on rice seed