Appendix I

Techniques for recovery of cysts from soil samples

Extracting cysts from soil or other substrates requires procedures that may be based on sieving, gravity, flotation, centrifugation or combinations thereof. On the basis of these principles, many methods have been developed or adapted in different laboratories and they have been widely used with varying degrees of success for nematology surveys and other research. A widely used and often modified apparatus for cyst extraction, based in the flotation principle, was described by Fenwick (1940). Seinhorst (1964) described an elutriator especially designed for processing moist soil samples. A cyst extraction device, combining elutriation with sieving, was developed by Oostenbrink (1960). Excellent reviews are available on extraction techniques for cyst nematodes from soils and other materials (Shepherd, 1986; Southey, 1986; Turner, 1998; Bellvert et al., 2008; Anon., 2009). There is no single method or device available that can be recommended as being most effective under all circumstances (Cooke et al., 1983; Urek & Sirca, 2003). Herein, we briefly give descriptions of cyst extraction using: i) a screening technique with decantation followed by sieving of a soil sample using a water stream; ii) the Seinhorst elutriator; and iii) the Fenwick can.

SIEVING TECHNIQUE

Sieving is the most basic technique for extraction. Soil is mixed with a large volume of water and heavy particles are allowed to settle for a brief time. The supernatant, containing floating cysts is then poured through several sieves, the first sieve retaining large debris and the second one catching the cysts. The technique as described by Ayoub (1977) is given here with some modifications (Fig. 97). The following equipment and materials are required for a maximum 1 litre (l) of soil: one plastic bucket or steel pan with at least 3 l capacity, 850 μm aperture and 180 μm sieves.
Fig. 97. Steps of sieving technique process for extraction of cysts from soil samples.

of 20-25 cm, stereoscopic dissecting microscope, 250 ml beaker, plastic scanning dishes with partitions, dissecting needles and mini tweezers. A 180 μm rather than 250 μm sieve for the second screen is described in some protocols because it has been shown that cysts of some species can pass through a 250 μm sieve (Sharma & Nene, 1986; Hisai et al., 2003). Kim and Riggs (1995) described a wet sieving technique with a list of required items for extracting cysts under field conditions.