ROOT-KNOT NEMATODE PROBLEMS IN FLOWER CROPS

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Florida is an important producer of cut flowers and bedding plants, especially during the winter season. Bedding plants produced in containers are often planted in local landscapes, and many commercial cut flowers are produced by directly growing in the ground. In either case, plants are exposed to soil-borne pests and pathogens. Many are susceptible to plant-parasitic nematodes, particularly root-knot nematodes (*Meloidogyne* spp.). Some frequently grown cut flowers that are particularly susceptible to root-knot nematodes include snapdragon (*Antirrhinum majus*), lisianthus (*Eustoma grandiflorum*), sunflower (*Helianthus* spp.), and gladiolus (*Gladiolus* spp.). Coleus (*Coleus blumei*), impatiens (*Impatiens* spp.), celosia (*Celosia argentea*), and snapdragon are among the most susceptible bedding plants.

With the restrictions on methyl bromide, flower growers face all of the problems and limitations experienced by vegetable growers. In addition, many of the nematode problems on flower crops are not well known, since many of the plant species have not been studied much. A long growing season may provide excellent opportunity for build up of nematode populations. Commercial growers may maintain some crops from September to May, with multiple plantings and or harvests in the same site. In a commercial planting of lisianthus in Martin County, fumigated in late July, 2001, root-knot nematode populations increased form zero in October, to 18/100 cm^3 soil on 26 February, 2002, and to 385/100 cm^3 soil on 11 April. Despite the eventual recovery of root-knot nematode populations (at 8.5 months after treatment), fumigation with methyl bromide was effective in maintaining low ($\leq$ 18/100cm^3 soil) population levels for 7 months.

A variety of methods for managing nematodes are being investigated including use of cover crops, solarization, organic amendments, alternative chemicals, and host plant resistance. Solarization, although somewhat inconsistent, has given good results in some tests (McGovern et al., 2000). Work with chemical alternatives to methyl bromide on floral crops in Florida dates back into the 1960s (Overman, 1965), but has been relatively limited since then. Cultivars of some flower crops such as marigold (*Tagetes* spp.), are resistant to root-knot nematodes. Recent work has determined that some cultivars of salvia (*Salvia* spp.), ageratum (*Ageratum houstonianum*), vinca or periwinkle (*Catharanthus roseus*), and zinnia (*Zinnia elegans*) are resistant to some species of root-knot nematodes (McSorley and Frederick, 1994; 2001). Responses vary widely within

some flower crops, such as petunia (*Petunia* spp.) or salvia, with some cultivars or hybrids resistant and others susceptible to nematodes.

Current research is focusing on the efficacy of alternative chemicals such as metam sodium and metam sodium plus chloropicrin for nematode management, as well as on identification of nematode-resistant crop and cultivars. Since flower growers may grow several different species and cultivars, crop rotation may be a possible option for nematode management in the future. This approach is not practical at present, since the susceptiblility or resistance of most flower cultivars to nematodes remains unknown.

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