Black Fly Problems in North America

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In the past decade, North America has had more than 50 management programs for black flies, with about two-thirds of these in Canada and the remainder in the US. Many areas on the continent have black fly problems, some quite severe, yet have no management program in place, typically because of a lack of funds or infrastructure. Efforts to control black flies are dynamic. In some areas, for example the Adirondack Mountains of New York State, control has been aimed against black flies for about 60 years. In other areas, such as Florida, problems have arisen in the past 10 years. About 93% of management programs for black flies in North America in the past decade have targeted pests of humans. The remaining 7% have targeted primarily livestock pests. All programs in North America currently use *Bacillus thuringiensis israelensis* (*Bti*) to manage black flies.

North America has 256 species of black flies. Since the beginning of efforts to control black flies in 1886, only 17 species have been targeted for control. In the past 10 years, the following 13 species have been targeted for management: *Prosimulium mixtum, Cnephia pecuarum, Simulium meridionale, Simulium johannseni, Simulium vittatum, Simulium tescorum, Simulium fibrinflatum, Simulium jenningsi, Simulium luggeri, Simulium slossonae, Simulium irritatum, Simulium truncatum,* and *Simulium venustum*. Knowledge of the host range of each species of black fly is very incomplete. Yet, this information is important in understanding the potential of different species to become pests. Determination of hosts through molecular analysis of vertebrate blood meals in field-caught, blood-fed female black flies has proved highly successful, using the approach of Malmqvist et al. (2004. Vertebrate host specificity of wild-caught blackflies revealed by mitochondrial DNA in blood. Proceedings of the Royal Society of London B (Supplement), Biology Letters 271: S152-S155). Molecular screening of field-caught black files for pathogens, such as *Leucocytozoon* species, also is recommended as a routine practice in management programs for black flies.

In conclusion, 1) black fly problems in North America will continue to increase as more people seek enjoyment in the outdoors and as the environment continues to be altered; 2) more knowledge of the hosts of black flies is needed to aid in predicting future pest problems; and 3) potential transmission of disease agents, using molecular techniques, should be considered in all black fly management programs.