A method currently being tested is putting the fungi in traps baited with lures that are known to be effective in attracting EAB. The fungi-contaminated EAB will fly off from the traps and mate with others, which will in turn contaminate the bodies of those mates, thereby spreading the disease. This strategy avoids blanket spraying of the selected fungi, which may affect other insects, but rather provides targetted control of EAB in the field.

### Nematodes

A species of nematode is also being tested as a potential biological control agent. An indigenous nematode species was found to parasitize EAB in the outbreak sites sampled in southwestern Ontario and is believed to hold promise as a control agent. The nematode, identified as *Rhabditis (Oscheius)*, was found on dead adult and larval EAB residing underneath the bark of dead ash trees. Field trials are planned to test this nematode by injecting it under the bark of stumps of felled ash trees to test its ability to suppress EAB larvae and beetles developing in the infested stumps and roots. This field trial mimics conditions typically found on golf courses, where it is important to keep the environment pristine and appealing to customers and at the same time stopping the spread of EAB from stumps to surrounding trees. Effectiveness of the treatment will be determined by comparing the number of adult insects emerging from treated and untreated stumps, as well as the number of nematode-killed larvae found under the bark of stumps and roots. Such a treatment would be environmentally sound because these nematodes are native and also cannot travel more than a metre within the perimeter of release.

## FUTURE WORK

It is important to have methods that permit the reliable identification and sensitive monitoring of biocontrol agents after release into the environment. Future work will be centered on developing molecular markers and tools for quantitatively detecting entomopathogenic fungi naturally occurring in or artificially released into EAB population by this auto-contamination approach and to investigate the persistency of the released fungi and their suppressive action on EAB. Also, a comparison will be made between the native nematodes and commercially available nematode species of the genera *Steinernematidae* and *Heterorhabditidae* for their ability to control EAB, both in the laboratory and in the field.

## CONCLUSION

A variety of approaches need to be integrated for successful management of EAB populations, including area wide detection surveys, trapping, treatment of individual high value trees with TreeAzin™ and ideally a biocontrol agent. The development of such a control strategy using fungi or nematodes would be helpful in reducing existing EAB populations and slowing their spread. Further testing will be required before these products can be produced on a larger scale or be approved for use beyond research trials. It is hoped that ultimately a commercial biocontrol product approved for use in Canada against EAB will become available to provide forest managers, communities, woodlot owners and others with more control options for protecting ash trees.

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## SUGGESTED READING

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