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## Implementation of EAB biological control in Minnesota

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Biological control of emerald ash borer (*Agilus planipennis*) (EAB) was initiated in Minnesota in 2010 and remains the most practical landscape level management option. Program implementation includes EAB detection, site assessment and parasitoid release and recovery. As of October 2016, a total of 449,049 parasitoid wasps (314,779 *Tetrastichus planipennisi*, 108,631 *Oobius agrili*, 24,026 *Spathius agrili* and 1,613 *Spathius galinae*) were released at 35 sites in the Twin Cities and southeastern Minnesota. Releases of *S. agrili* were discontinued in 2013 because national program researchers theorized that *S. agrili* and EAB lifecycles are not synchronized in northern latitudes. Both *T. planipennisi* and *O. agrili* were recovered. *Tetrastichus planipennisi* were recovered by peeling ash trees to look for wasp larvae and pupae. The species was also recovered by dissecting EAB larvae to look for internal wasp larvae. *Oobius agrili* was recovered using a bark sifting method. Recoveries over multiple years demonstrated that parasitoids are overwintering, dispersing, establishing and increasing in population. Further studies are needed to assess impact on EAB populations and evaluate a new biocontrol agent, *Spathius galinae*.

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