



Invasive Insect Species: Unwanted Invaders!

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Invasive insect species are exotic insects or alien invaders that are not native to North America, nor are they wanted! So, how did they get here and what threat do they pose to us? These two questions are often very difficult to answer directly. There are frequently many factors associated with how an exotic insect species makes its way into the United States. And, once its get here, it is difficult to predict the potential negative impact (if any) that an alien invader may have on our various agricultural ecosystems.

Exotic insects can, and often pose serious problems to agricultural ecosystems that are not accustomed to them. In these new environments, there are typically few or no predators, parasites, or diseases to keep the alien invader populations in check. Sometimes exotic species multiply so quickly that individuals cover all

available habitat, literally crowding out other desired species, as in the case of the Multicolored Asian Lady Beetle (*Harmonia axyridis* (Pallas)). Sometimes an exotic species out-competes all related species, as in the case of the Red Imported Fire Ant (*Solenopsis invicta*), which in the Southern United States has caused not only a decline in native ants species, but also population decreases of ground-dwelling birds, mammals, and reptiles.

There are numerous examples of exotic insect species that have been introduced into the United States. They include: Gypsy Moth (*Lymantria dispar*), Japanese Beetle (*Popillia japonica* Newman), Asian Longhorned Beetle (*Anoplophora glabripennis*), Multicolored Asian Lady Beetle, Red Imported Fire Ant (*Solenopsis invicta*), as well as

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several others. Two insect species whose recent introduction to the United States has generated a lot of concern are the Emerald Ash Borer (*Agrilus planipennis* Fairmaire) and the Asian Tiger Mosquito (*Aedes albopictus*). It is suggested that both these species entered the United States via commercial shipments from Asia within the past 10-20 years.

The Emerald Ash Borer (EAB), *Agrilus planipennis* Fairmaire, is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002. The larvae (immature stage) feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients. It is suggested that EAB likely arrived in the United States on solid wood packing material carried over 8-10 years previously in cargo ships or airplanes originating in its native Asia. In Michigan it has only been found in ash trees. Ash trees in woodlots as well as landscaped areas are affected. For the most part, affected trees or branches appear to be at least 2 inches in diameter and larger. All species of North American ash species (*Fraxinus* spp.) appear to be susceptible.

EAB is also established in Windsor, Ontario; it was found in Ohio in 2003 and northern Indiana in 2004. Since its discovery, EAB has: 1) killed at least 12 million trees in Michigan, Ohio and Indiana, most devastation occurring in southeastern Michigan; 2) caused regulatory agencies to enforce quarantines in Indiana, Michigan, and Ohio and fines to prevent potentially infested ash trees, logs, or firewood from moving out of areas where EAB occurs; and 3) cost municipalities, property owners, nursery operators, and forest product industries tens of millions of dollars.

The Asian Tiger Mosquito, *Aedes albopictus*, is native to southern and eastern Asia. This mosquito was first found in North America near Houston, Texas, in 1985, and is thought to have entered the country with a shipment of used tires. Since that time it has spread widely throughout the United States, especially through the southeast of the country. By 1992 it was considered to be established as far north as Delaware and Minnesota, and a 1999 survey showed that it was established in 25 states.

In its native range, the Asian Tiger Mosquito is an efficient vector of dengue fever, and laboratory work has shown that it is also an efficient vector of Eastern Equine Encephalitis (EEE) virus. Although transmission usually occurs in tropical or subtropical areas, public health specialists are concerned that if dengue is introduced to the United States from the Caribbean area, the presence of this mosquito will make it difficult to eradicate the dengue virus.

The EEE virus normally cycles between passerine birds (songbirds, which include American Robin and Northern Mockingbird) and the mosquito *Culiseta*

melanura, in forested wetlands. The Asian Tiger Mosquito feeds exclusively on birds and, thus, does not transmit the EEE virus to mammals such as horses or people. However, other species of mosquito, such as *Aedes albopictus*, that feed on both birds and mammals, readily transmit this virus to mammals.

EEE is prevalent in most areas where the Asian Tiger Mosquito is becoming established. In the United States, EEE causes occasional epidemic mortality in horses. Many of these outbreaks are small and localized; however some have been rather large, involving as many as 14,000 horses and mules. Generally, 80%-90% of horses that develop EEE die. EEE has been reported on occasion in horses in eastern Canada. Captive birds raised for hunting or human consumption, such as domestic ducks and turkeys, ring-necked Pheasants, and Emus have also occasionally become infected.

Although EEE is not a common human disease, it is estimated 1/3 of people who develop EEE die, and many survivors are permanently incapacitated. In the past 35 years, there have been just over 150 cases recorded in the United States. Fortunately, EEE is not contagious from human to human or horse to horse.

These are merely two examples of unwanted, invasive or exotic insect species that potentially have the ability to negatively affect animal and human health, economics, and our valuable environmental resources. Thus, it is important to become educated and stay informed about potentially threatening exotic insect species in order to reduce the likelihood of negative impact(s) associated with such unwanted pests. ♻



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