

# Study finds large potential range for invasive spotted lanternfly

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The spotted lanternfly (*Lycorma delicatula*), adult and nymphs shown here, arrived in Pennsylvania in 2014 and has quickly become one of the top insect pests of concern there and in neighboring states. While its preferred host is tree of heaven (*Ailanthus altissima*), the spotted lanternfly has been reported to attack more than 70 plant species, including grapes, apples, cherries, and several other fruit and timber tree species. A new habitat-modeling study shows most of New England and the mid-Atlantic states as well as parts of the central US and Pacific

Northwest are vulnerable to establishment of the spotted lanternfly if it finds its way there. Credit: Stephen Ausmus, US Department of Agriculture

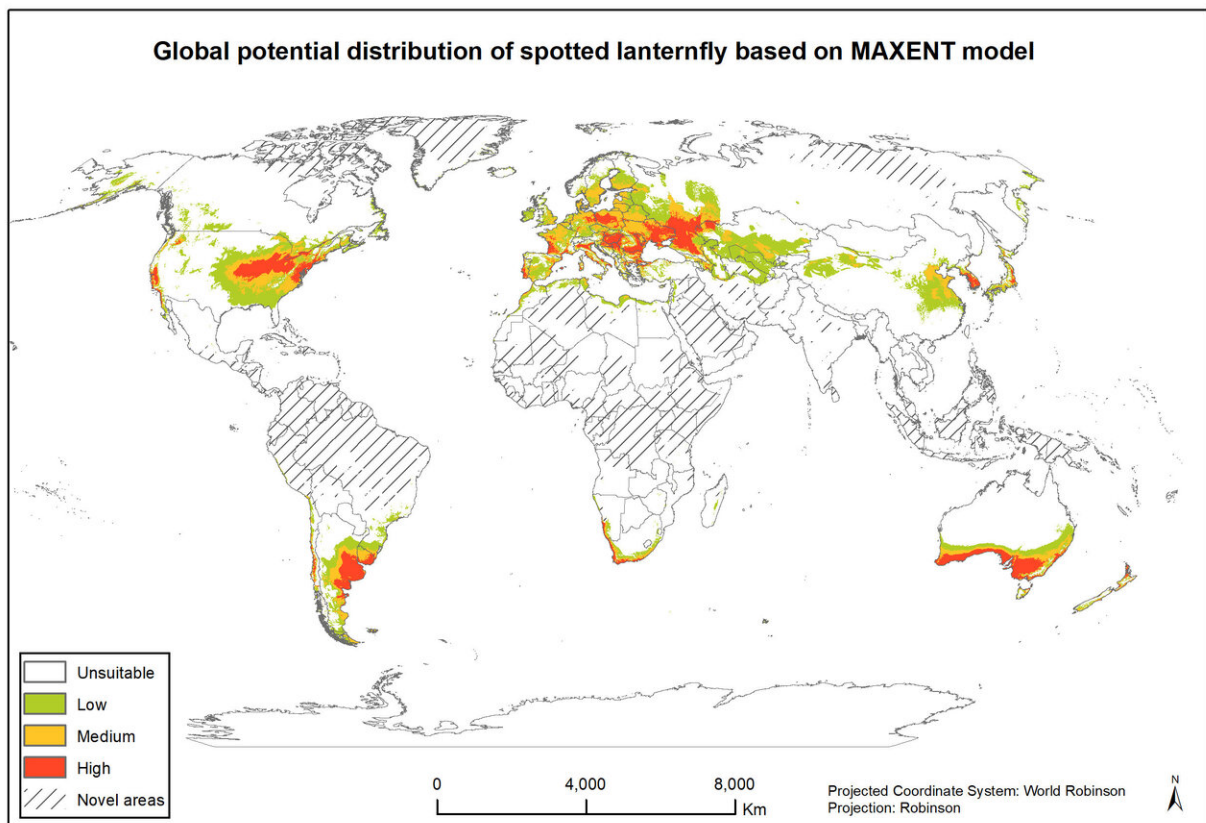
As the invasive spotted lanternfly wreaks havoc in the mid-Atlantic United States, scientists and a range of tree and fruit growers around the world are concerned about where the pest could show up next. A new habitat-modeling study from the U.S. Department of Agriculture may not put those minds at ease, as findings show large swaths of the United States and beyond are likely to be vulnerable should the spotted lanternfly continue to spread.

Tewodros Wakie, Ph.D., research ecologist at the USDA Agricultural Research Service (ARS), led a team in studying [climate data](#) from the spotted lanternfly's native range in Asia and areas it has invaded in Pennsylvania and New Jersey, and they compared that information with climate data for other global regions to model likely suitable habitat for the insect. Their results, published today in the *Journal of Economic Entomology*, show that the spotted lanternfly could become established in most of New England and the mid-Atlantic states as well as parts of the central U.S. and Pacific Northwest. Globally, they also found suitable habitat in much of Europe plus parts of eastern Asia and the southern reaches of Africa, Australia, and South America.

"Locations with high risk of spotted lanternfly establishment should consider taking preventive measures," Wakie says. "Early detection is key to control and eradication."

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more than 70 [plant species](#), including grapes, apples, cherries, and several other fruit and timber tree species. *Lycorma delicatula* is not a fly but a kind of insect called a planthopper, and females lay eggs in masses on tree trunks, branches, rocks, or even walls or fences. The egg masses resemble clumps of mud, making them well-suited to escaping detection and potentially hitching a ride to new locales on transported materials.

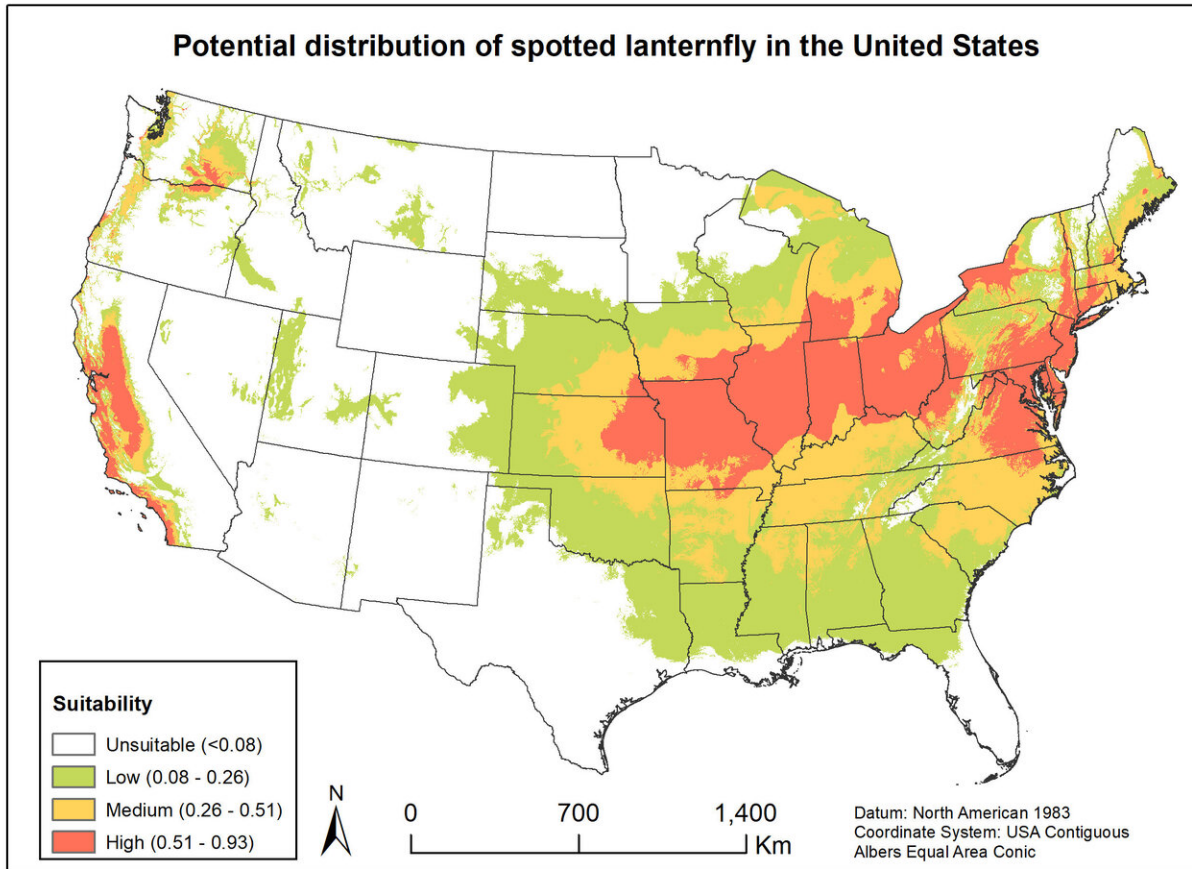


Researchers at the US Department of Agriculture and the Xinjiang Institute of Ecology and Geography in China studied climate data in the host ranges of the spotted lanternfly (*Lycorma delicatula*) to model what other locales offer potentially suitable habitat for the invasive insect. In the United States, their findings show most of New England and the mid-Atlantic states as well as parts of the central US and Pacific Northwest are vulnerable to establishment of the spotted lanternfly if it finds its way there. Credit: US Department of Agriculture/Journal of Economic Entomology

Wakie is based at the USDA-ARS Temperate Tree Fruit and Vegetable Research Unit in Wapato, Washington. Despite being far removed from the spotted lanternfly's current ranges, its ability to spread makes it a serious concern for Washington's multibillion-dollar apple, cherry, grape, and hops industries. "The potential economic impact of newly arriving pests in Washington is huge," Wakie says. "Due to this, our lab is always on the alert for newly arriving invasive pests. Our lab unit at Wapato has a history of conducting invasive species establishment risk studies."

Wakie collaborated with USDA-ARS colleagues Lisa Neven, Ph.D., and Wee Yee, Ph.D., and Zhaozhi Lu, Ph.D., of the Xinjiang Institute of Ecology and Geography in China to model suitable habitat for *L. delicatula*. Their analysis of climate data suggests that [mean temperature](#) in the driest three months of the year and elevation are two of the most important variables for a region's suitability for spotted lanternfly. Specifically, areas where dry-season temperatures average between 7 degrees Celsius above and below zero (19 and 45 degrees Fahrenheit) and areas below 1,000 meters (3,280 feet) in elevation are most suitable.





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These conditions in the United States align with zones where tree of heaven—a non-native species itself, introduced to North America in the late 1700s—is commonly found. "We are surprised by how the spotted

lanternfly distribution closely matched that of the tree-of-heaven," Wakie says.

States where the spotted lanternfly is a threat have asked members of the public to report sightings and to closely inspect outdoor items such as firewood, vehicles, and furniture for egg masses and scrape them off if found. USDA-ARS entomologists at the Beneficial Insects Introduction Research Unit in Newark, Delaware, are evaluating two parasitoid wasp species from China for their potential to be deployed as natural enemies of the spotted lanternfly in the U.S., but that process may take up to a few years. In the meantime, Neven says habitat modeling research will help at-risk locales prepare for the spotted lanternfly's potential spread.

"The goal of this research was to identify the potential for spotted lanternfly to spread based on its current distribution," she says. "This work will aid farmers and individual state departments of agriculture to develop mitigation plans based on this predictive model."

"The Establishment Risk of *Lycorma delicatula* (Hemiptera: Fulgoridae) in the United States and Globally" will be published online on October 3 in the *Journal of Economic Entomology*.

**More information:** "The Establishment Risk of *Lycorma delicatula* (Hemiptera: Fulgoridae) in the United States and Globally" *Journal of Economic Entomology* (2019). [DOI: 10.1093/jee/toz259](https://doi.org/10.1093/jee/toz259)

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