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Teaching Farmers and Commercial Pesticide Applicators About Invasive Species in Pesticide Training Workshops

Abstract

Farmers and agricultural professionals who are aware of species likely to invade agricultural landscapes can be active participants in efforts to detect invasive species. To reach this audience we created a short invasive species program and added it to the existing and required pesticide applicator recertification workshops. We highlighted four invasive species that can affect rural landscapes. Publications were made available. As a result, farmers and agricultural professionals were very receptive to learning about invasive species that may affect their agricultural business. Teaching about invasive species through pesticide applicator programs is an effective way to reach agricultural and rural audiences.

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Background

There is a growing number of invasive species in Minnesota and the U.S. Invasive species are widely recognized as threats to global biodiversity, agriculture, and natural resources (Pimentel, Zuniga, & Morrison, 2005). In Minnesota, a state multi-agency Forest Pest First Detector Team has created a training program for interested residents, and this program is delivered annually. Collaborating with multi-agency partners to reach new audiences can be successful and cost effective (Ober, Giuliano, & Dillard, 2012).

Invasive species (insects, plants, etc.) are found in all landscapes, including our rural and agricultural areas. It is important to teach rural residents about invasive species. In an effort to raise awareness about the most important invasive species affecting farmer income and the rural environment, we conducted a short presentation during the University of Minnesota Extension's private pesticide applicator workshops for farmers and commercial applicators trainings. These workshops were held in January and February of 2014 throughout the agricultural regions of Minnesota. Workshop content includes update of new pesticide regulations, safety practices, integrated pest management, and other pesticide topics. The workshops are required to update farmer and commercial applicators to apply restricted use pesticides and are well attended.

Need

Invasive species education has been focused on environmentalists and natural resource professionals to reach interested and receptive audiences. Outreach to educate homeowners and landowners is being developed to bring more attention to invasive species; however, not all residents are being reached. For example, a Virginia study found that a majority of local landowners had not heard or read information about invasive plants in the area, suggesting a need for cost-effective means to reach a broad base of landowners (Steele, McGill, Chandran, Grafton, & Huebner, 2008). Minnesota farmer and commercial pesticide application education of invasive species in the past has been mainly focused on noxious weeds, which may include invasive weeds. A survey of Extension pesticide coordinators in nine midwestern states revealed that 70 % were teaching invasive species to farmers and nearly 100% were teaching invasive species to commercial applicators. However, most of the invasive species taught were vegetative plants on the noxious weed list and insects that could affect crops. To a lesser degree, woody invasive plants were taught at these lessons.

Invasive species lessons were not included in Minnesota farmer or commercial pesticide applicator trainings before 2014. In Minnesota, our Forest Pest First Detector Program (FPFD) has trained over 500 volunteers (Master Gardeners, horticulturalists, arborists, etc.) throughout the state since 2008. New site infections of emerald ash borer, oriental bittersweet, and brown marmorated stink bug have been reported by trained FPFD volunteers. Early detection of invasive species is key to effective control. Trained volunteers or individuals increase the chances of early detection, therefore, invasive species that could be present in rural areas should be taught at farmer and commercial applicator workshops. Extension educator programs and proactive leadership roles in addressing invasive species can help minimize the threat and impact of invasive species (Sundermeier, 2005).

Method

In order to reach farmers and commercial applicators it was important to include the invasive species lesson as part of a program where attendance was assured. The pesticide certification trainings held in Minnesota seemed to be a logical fit. This includes the Private Pesticide Applicator (farmer) and the Commercial/Noncommercial Agricultural Pesticide Applicator training. We focused on four invasive species affecting rural areas: emerald ash borer (*Agrilus planipennis*, affecting ash trees in windbreaks and rural communities), brown marmorated stink bug (*Halyomorpha halys*, affecting over 300 plants, including apple trees, grapes, corn, and soybeans), buckthorn (*Rhamnus cathartica*, a small invasive tree common to area windbreaks and woodlands that is an overwintering host to the soybean aphid), and oriental bittersweet (*Celastrus obiculatus*, an invasive perennial vine which changes the understory of windbreaks and woodlands).

Workshop topics included history, life cycle, identification, damage, and control of the invasive species. Presentations, species identification cards, resources, and handouts were made available from partnering state agencies. A similar presentation was added to the certification workshop/trainings for commercial agricultural pesticide applicators. Two PowerPoint presentations were prepared for the farmer trainings, a short version with two invasives (buckthorn and brown marmorated stink bug) and a longer version with four invasives (buckthorn, oriental bittersweet, emerald ash borer, and brown marmorated stink bug). Extension educators had the option of presenting the two or four invasive

species lesson. All four invasive species were taught to commercial pesticide applicators with a video option.

Results

In 2014, Extension educators taught the invasive species lesson in 12 counties in central Minnesota, reaching 467 farmers. There were six Field Crop Pest Management Certification workshops for commercial pesticide applicators held in southern Minnesota in January, 2014. Commercial applicators participating totaled 717. A total of 1,184 participants were taught about invasive species at these pesticide workshops.

The following evaluation summary results are from the commercial applicator sessions.

1. Before this workshop, how knowledgeable would you say you were about the Invasive Species in Agricultural Landscapes, presented as a result of the workshop you completed today?

   60.9 % of participants responded to Somewhat Knowledgeable and Very Knowledgeable.

2. Are you MORE knowledgeable about the Invasive Species in Agricultural Landscapes, presented as a result of the workshop you completed today?

   93.1 % of participants responded to More knowledgeable and A Lot More knowledgeable.

3. How much of the information on the "Invasive Species in Agricultural Landscapes" topics presented during today's workshop was new to you?

   73.5 % of participants responded to Much or Very Much. (were new topics)

4. As a result of today's workshop, how likely are you to MAKE CHANGES in the work that you do, with regard to the "Invasive Species in Agricultural Landscapes" topics presented?

   70.3 % of participants responded to Somewhat Likely or Very Likely.(to make changes)

As Extension continues to develop and evolve regarding invasive species education, it is important to consider alternative approaches to the dissemination of scientific information (Shaw, Dalrymple, & Dominique, 2012).

Impacts

Impacts have not been reported yet; however, the implicated and potential impact of teaching farmers and commercial applicators about invasive species could possibly lead to early detection of invasive species due to greater number of observers in all regions of Minnesota. Early detection is key to limiting large environmental and economic damage or crop losses and to targeting control and management practices. Economic values could be in the millions of dollars. Providing relevant information may precipitate behavior change, particularly when lack of knowledge may be a barrier to action (Stern, 2002).

Conclusions

The study reported here documented that farmers and commercial applicators are receptive to learning more about invasive species that may affect agricultural crops or rural landscapes. To reach rural audiences with new topics, developing educational programs that can be incorporated into the existing or established workshops or trainings they are attending can be successful. Teaching invasive species through the pesticide certification program is an effective way to educate farmers and commercial applicators about these invasive pests that will affect rural landscapes. The program can be replicated in other states.

References

Ober, H. K., Giuliano, W. M., & Dillard, J. (2012). Leveraging partnerships to achieve high impact: Lessons from wildlife field days. *Journal of Extension*, 50(1) Article 1FEA1. Available at: http://www.joe.org/joe/2012february/a1.php

Pimentel, D., Zuniga, R., & Morrison, D. (2005). Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics*, 52(3), 273–288.

Shaw, B., Dalrymple, K., & Dominique, B. (2012). Factors Associated with Behavioral Compliance to Prevent the Spread of Viral Hemorrhagic Septicemia, *Journal of Extension*, 50 (2) Article 2FEA9. Available at: http://www.joe.org/joe/2012april/a9.php

Steele, J., McGill, D., Chandran, R., Grafton, W., & Huebner, C. (2008). Landowner Characteristics Associated with Receiving Information About Invasive Plants and Implications for Outreach Providers, *Journal of Extension*, 46 (6) Article 6FEA7. Available at: http://www.joe.org/joe/2008december/a7.php

Stern, P. C. (2002). Changing behavior in households and communities: What have we learned? In T. Dietz & P. Stern (Eds.), *New tools for environmental education* (pp. 201-211). Washington D.C.: National Academy Press.

Sundermeier, A. (2005). Exotic pest invasion—Plan of action for extension educators. *Journal of Extension*, 43(5) Article 5TOT5. Available at: http://www.joe.org/joe/2005october/tt5.php

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