



Perceived impacts of wild turkeys and management techniques for Wisconsin ginseng production



Scott J. Werner^{a, *}, Stephanie A. Shwiff^a, Julie L. Elser^a, Katy N. Kirkpatrick^a, Susan E. Pettit^a, Jason Suckow^b, Robert C. Willging^c, Jim A. Tharman^c, Joe Heil^d

^a United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, National Wildlife Research Center, 4101 LaPorte Avenue, Fort Collins, CO 80521-2154, USA

^b United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, 732 Lois Drive, Sun Prairie, WI 53590-1100, USA

^c United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, 3654 Nursery Road, Rhineland, WI 54501-9118, USA

^d Ginseng Board of Wisconsin, Inc., 7575 Bombardier Court, Suite 300, Wausau, WI 54401, USA

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ABSTRACT

The restoration of eastern wild turkeys (*Meleagris gallopavo silvestris*; Viellot) within Wisconsin has successfully populated the central counties which account for 95% of American ginseng (*Panax quinquefolius* L.) production. In response to perceived and emerging conflicts, the Ginseng Board of Wisconsin, Inc. conducted producer surveys in March 2006 and 2012 to determine the extent and timing of wild turkey damage experienced among all Wisconsin ginseng producers, and the methods used to minimize wild turkey damage. We summarized 47 and 63 completed surveys in 2006 and 2012, respectively. Most survey respondents reported that wild turkeys were present and caused damage at their ginseng facilities every year. Turkey damage was regarded as “moderate” among most survey respondents. The majority of respondents in 2006 reported that annual losses were \$2000–\$5000, while most respondents in 2012 reported losses of less than \$2000. Most producers reported spending less than \$2000 annually for turkey damage management. Vertical fencing was reported as the most used and most effective damage management technique; the reported use and long-term efficacy of vertical fencing increasing substantially from 2006 to 2012. The increased use of vertical fencing may be related to the general downtrend in annual monetary losses due to wild turkeys from 2006 to 2012. These survey results will be used to further identify, investigate and manage the impacts of wild turkeys to Wisconsin ginseng production.

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1. Introduction

In the mid-1800s, wild turkeys (*Meleagris gallopavo silvestris*; Viellot) were common throughout the United States, including Wisconsin. Towards the end of the 19th century, however, wild turkeys became extirpated in most states. They were reintroduced in many states, including Wisconsin, in the mid-1970s. Between 1976 and 1993, almost 4000 turkeys were stocked at 164 sites in 49 counties of Wisconsin (Payer and Craven, 1995).

Reintroduction efforts resulted in increased wild turkey populations and increased turkey hunting opportunities in Wisconsin. In 1983, the abundance of wild turkeys in Wisconsin was sufficient

to support a “gobblers only” spring hunting season, and 1200 permits were issued. In 1989, over 20,000 permits were issued and a fall (hen and gobbler) season was established. In 1989, “the Wisconsin turkey flock was estimated at 50,000 plus over a wide range in the southern half of the state, especially in about a dozen southwestern counties” (Craven, 1989). In 1993, more than 130,000 wild turkeys inhabited Wisconsin (Payer and Craven, 1995). Approximately 85,400 permits were issued in Wisconsin for the fall 2005 turkey season. Over 200,000 permits were available for Wisconsin turkey hunting in spring 2006 (WDNR, 2006). More than 50,000 turkeys were harvested annually in Wisconsin during the spring 2007–2009 hunting seasons. In spring 2012, 234, 097 permits were available and Wisconsin turkey hunters reportedly harvested 42,612 turkeys (WDNR, 2013).

The restoration of wild turkeys within Wisconsin in 1991 and 1999 populated the central counties that account for 95% of

* Corresponding author. Tel.: +1 970 266 6133; fax: +1 970 266 6138.

E-mail address: Scott.J.Werner@aphis.usda.gov (S.J. Werner).

American ginseng (*Panax quinquefolius* L) production in the United States (NASS, 1992). The 2004 release of 164 turkeys at 6 release sites in Douglas and Bayfield Counties introduced turkeys to the far northern reaches of Wisconsin, and brought the restoration phase of Wisconsin's turkey management program to a close. In total, at least 3843 turkeys were captured, translocated, and released at 183 sites across Wisconsin (WDNR, 2006).

Although impacts of wild turkeys to Wisconsin agriculture were reviewed in 1995, ginseng damage caused by turkeys was not reported (Payer and Craven, 1995). More recently, wild turkey damages to specialty crops have been regarded as considerable for high-value crops such as ginseng (Miller et al., 2000; Groepper et al., 2013). Ginseng is a high value root crop grown under conditions of natural (i.e., woods-grown) or simulated forest understories (e.g., litter, shade). Ginseng has gained popularity due to its purported health benefits, including increased physical and mental performance, especially improved memory and mood (Briskin, 2000; Scholey et al., 2010). Wisconsin is an important ginseng producer, leading the U.S. in ginseng exports and generating up to \$20 million in gross income in Wisconsin each year (WI DATCP, 2014).

The production of ginseng typically includes seeding 0.1–3 ha gardens in the fall, and harvesting mature roots three to four years later. Gardens are covered with straw before winter and shaded with suspended lathing or shade cloth during summer. Wild turkeys can damage ginseng by scratching litter or straw within ginseng gardens. Scratching can damage the crown of ginseng roots, thus precluding subsequent growth and marketable production. Scratching and removal of mulch within ginseng gardens can also increase frost heaving of roots during the winter–spring transition, increase wind exposure and desiccation of ginseng in summer, and decrease insulation needed in winter. Some growers believe that wild turkeys also consume ginseng seeds in newly-planted gardens. In a survey regarding wild turkey impacts to agriculture in the United States and Ontario from 1996 to 1999, Wisconsin ginseng producers reported the extent of their wild turkey damages. Of 22 agricultural crops associated with reported and confirmed damages caused by wild turkeys, ginseng was the only crop with confirmed “heavy” damage (Tefft et al., 2005).

Wild turkeys typically represent one to two percent of overall damage reported to the Wisconsin Department of Natural Resources (WDNR) each year. In 1998, \$37,621 of agricultural losses were attributable to wild turkeys in Wisconsin (1 claim in each of 2 counties) and \$35,200 (94%) of these damages were associated with ginseng damage. In 2004, \$196,318 of agricultural depredation was associated with wild turkeys in Wisconsin (31 claims in 12 counties); \$188,251 (96%) of these losses were associated with ginseng damage (WDNR, 2006). These losses were appraised (i.e., verified) by county wildlife damage agents or representatives of the United States Department of Agriculture's Wildlife Services program.

Some complaints associated with wild turkey depredation to agricultural crops are actually caused by species other than wild turkeys (Gabrey et al., 1993; Swanson et al., 2001; Tefft et al., 2005; Groepper et al., 2013). Ginseng, however, may be particularly vulnerable to wild turkeys (Miller et al., 2000; Tefft et al., 2005). As part of the aforementioned survey regarding wild turkey impacts to agriculture in the United States and Ontario, Wisconsin was the only state that reported more than 100 annual depredation complaints and greater than \$50,000 annual damage caused by wild turkeys (Tefft et al., 2005).

2. Methods

The Ginseng Board of Wisconsin, Inc. surveyed producers to investigate the impacts of wild turkeys to Wisconsin ginseng

production. The survey was developed to determine the extent and timing of damage experienced among all producers, and the methods used to minimize the impacts of wild turkeys to their ginseng production. The Board circulated the survey to ginseng producers at their March 2006 meeting and subsequently mailed the survey to all Wisconsin ginseng producers that did not complete the survey during the March meeting. Surveys were distributed to the entire membership of the Ginseng Board of Wisconsin. A total of 365 surveys were distributed in 2006 and 170 surveys were distributed in 2012. Some minor changes were included in the 2012 survey, as described below.

2.1. Survey questions and analysis

The two surveys solicited information regarding wild turkeys and Wisconsin ginseng production. All surveyed producers received a cover letter from the Ginseng Board of Wisconsin, Inc., inviting producers to complete the survey and explaining the confidentiality of the names and locations of survey respondents. The survey questions regarded characteristics of ginseng production including location and size of gardens, timing of turkey presence and damage, and extent of damage. Producers were asked about factors that might attract wild turkeys to ginseng gardens including root age, type of straw used, and proximity to woods. Producers were also asked about the damage management techniques they used to mitigate wild turkey impacts on their farms.

The WDNR has had a wildlife damage program since 1931. The current Wildlife Damage Abatement and Claims Program (WDACP) was created in 1983. This program, funded by Wisconsin hunting license fees, provided up to \$15,000 per claimant in 2006 and up to \$10,000 per claimant in 2012 for confirmed agricultural depredation caused by white-tailed deer (*Odocoileus virginianus*; Zimmerman), black bears (*Ursus americanus*; Pallas), Canada geese (*Branta canadensis* L.), and wild turkeys. Producers were asked if they were aware of the WDACP program, if they received WDACP payments between 1996 and 2006 (extended to 2011 in the 2012 survey), and the amount of the appraised damage for their claims.

Enrollees of the WDACP are eligible for abatement as well as claims for realized damage. The WDACP requires that the property enrolled must allow hunting for the species causing damage. Ginseng producers were asked about turkey hunting access on their property, the level of interest that they experienced among hunters, and hunter success. Producers also reported whether they had received an agricultural damage shooting permit (i.e., recommended under WDACP) and tags from the WDNR, and if hunting or permitted shooting decreased their realized ginseng damage. Finally, the surveys included questions related to average losses and damage management costs experienced by ginseng producers due to wild turkeys. These estimates enabled us to summarize damage costs and damage management expenditures among Wisconsin ginseng producers.

The 2012 survey contained some minor differences from the 2006 survey. When asked about factors that attract wild turkeys to ginseng gardens, producers were given the option to choose “no preference” in 2006, and “no opinion” in 2012. The 2006 survey asked how many days were hunters were present; this question was omitted in 2012. Conversely, the 2012 survey added a question about the percentage of hunters who were successful. With regard to damage management techniques, the 2012 survey referred to Mylar ribbon as Mylar balloons, potentially causing some confusion among respondents. Questions about the amount of ginseng loss and the amount spent on damage management only allowed producers to select from a range of numerical values in 2006, but options for “no damage” and “none” were included in the 2012 survey. Finally, only the 2012 survey solicited an estimation of the percent

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