

MULTIFLORA ROSE, A PLANT ON THE DECLINE IN WISCONSIN?

Mark J. Renz and Jerry D. Doll ¹

Introduction

Multiflora rose (*Rosa multiflora*), a nonnative shrub native to East Asia, has established throughout the Midwestern, Southern and Eastern United States. While this plant was intentionally introduced as an ornamental plant and for wildlife habitat, it has become one of the more common invasive plants in the eastern United States as it infests over 45 million acres (Underwood et al., 1996). Currently multiflora rose dominates pastures and edges of forests within the southern part of Wisconsin. Besides losses in productivity in pastures, multiflora rose greatly reduces the accessibility of these areas for recreation due to the creation of impenetrable thickets.

Recently a disease native to North America called rose rosette disease (RRD) has been found infesting multiflora rose plants within southwestern Wisconsin. This disease was first discovered in Canada in 1940 and currently it can be found in Alabama, Arkansas, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Missouri, Nebraska, Oklahoma, Ohio, Pennsylvania, Tennessee, Texas, West Virginia, and Wisconsin (Armine, 2002). Its distribution in Wisconsin is limited, but observations indicate that it is spreading. Currently infested multiflora rose plants have been seen in Vernon, Crawford, Grant, Richland, Sauk, Iowa, Lafayette, Green, Racine, and Dane counties (personal communication J.Doll, P. Pelliterri, A. Barta). This disease is fatal to multiflora rose as infected plants they die within 5 years (Epstein and Hill, 1999; Armine 2002). While no tests are currently available that verify if plants are infected, symptoms on multiflora rose are quite distinct making identification easy. Symptoms include a red coloration of the underside of leaf veins, elongated shoots, an increase in the number of thorns, and a proliferation of lateral buds on shoots that produce many reduced and malformed leaves (witches' broom).

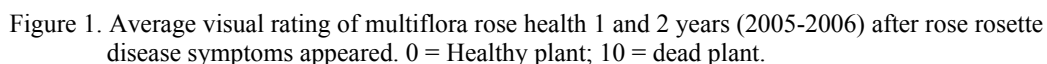
RRD disease has not been isolated, but is believed to be a virus that is transmitted by an eriophyid mite (*Phyllocoptes fructiphylus*). This mite has been shown to be able to transmit the disease under greenhouse and field conditions (Armine, 2002). Dense multiflora rose stands in full sunlight appear to be more suitable for rapid spread of the disease, than sparse stands in shaded conditions. RRD also can infect some ornamental and native rose species/cultivars so caution should be used if considering trying to introduce this disease artificially.

Natural spread of RRD has been reported throughout the United States. In Iowa spread generally has not been explosive with the number of infected plants in a field generally remained the same or slowly increasing over time (Epstein and Hill, 1999). A few sites in Iowa were observed to have a rapid increase in infection rates over a 2 to 3 year period, but the rate rapidly decreased after infected plants died (Epstein and Hill, 1999). The method of spread is believed to be from the mite vector which can travel by wind and on bodies of small arthropods such as aphids and thrips. Lack of spread is believed to be due to several factors related to the vector's ability to reproduce, spread and over-winter. For example cold temperatures (< -31°C) and rapid changes in daily temperature in the early winter (17°C) have been observed to kill symptomatic shoots and the mite vector that over-winters on these shoots (Epstein and Hill, 1999; Armine, 2002). It has also been observed that when multiflora rose is drought stressed, infection rates from *P. fructiphylus* are dramatically reduced (Armine, 2002). Armine (2002) believes that *P.*

¹ Extension Weed Scientist and Emeritus Extension Weed Scientist, Dept. of Agronomy, Univ. of Wisconsin-Madison, 1575 Linden Dr., Madison, WI 53706.

Observations were initiated in 2004 to document the development of RRD on multiflora rose within a pasture in Wisconsin and to determine length of time for death of infected plants. The pasture is in Richland Center Wisconsin, and plants were selected on the edge of a newly observed RRD infected multiflora rose population. Twenty plants were selected that varied in size and all had minor to no symptoms present in 2004. Estimates of injury and mortality were assessed in June in 2005 and 2006. Analysis of variance was used to determine if bush size was related to health rating. Paired T-tests were used to assess the difference between 2005 and 2006 ratings.

Within the entire pasture, infection of multiflora rose plants increased from 2004-2006, with a visible decline of multiflora rose cover throughout the field (personal observation J. Doll). Multiflora rose health declined rapidly as health ratings were significantly higher (worse) ($P < 0.0001$) in 2006 compared to 2005 (Figure 1). Once symptoms appeared, decline in the health occurred quickly as plants averaged a 3 point increase in injury rating from 2005-2006 with a



maximum of 6 (data not shown). Size classes of bushes did not influence injury ratings in either year. In 2006, mortality was observed in 5 out of the 20 multiflora rose plants (data not shown). It appears that size of plants may be important in the time to death as 4 out of the 5 plants that died were categorized as small. While short-term observations indicate that multiflora rose populations may be reduced by 90% or more by RRD, the long-term results are likely more complex. As large shrubs die, RRD frequency in the area dramatically decline, allowing seedling multiflora rose plants to establish (Armine, 2002). These seedlings can reestablish multiflora rose populations (Armine, 2002). Rose rosette disease remains present at the site, but infection rates remain low (20 to 25 %) until conditions that cause its spread reappear causing another large-scale reduction in multiflora rose populations (Armine, 2002). This cycling of infection and reestablishment is common with biological control programs, and additional management will be required to reduce multiflora rose populations further. Future research looks to integrate other management methods with RRD to attempt to achieve greater reduction in populations.

References

- Armine, J.W. 2002. Multiflora rose. p. 265-292. In R. Van Driesche et al. (ed.) Biological control of invasive plants in the eastern United States. USDA Forest Service Pub. FHTET-2002-04.
- Epstein, A.H., and J.H. Hill. 1999. Status of rose rosette disease as a biological control for multiflora rose. *Plant Dis.* 83(2):92-101.
- Epstein, A.H., J.H. Hill, and W. Nutter. 1997. Augmentation of rose rosette disease for biocontrol of multiflora rose (*Rosa multiflora*). *Weed Sci.* 45:172-8.
- Tipping, P.W., and A.B. Sindermann. 2000. Natural and augmented spread of rose rosette disease of multiflora rose in Maryland. *Plant Dis.* 84(12):1344.
- Underwood, J.F., M.M. Loux, J.W. Armine, and W. B. Bryan. 1996. Multiflora rose control. Ohio State Univ., Ext. Bulletin no. 857. Columbus, OH.