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First Collection Records of *Hippodamia variegata* (Coleoptera: Coccinellidae) in Minnesota Corn and Soybean

Thelma T. Heidel¹ and Amy C. Morey¹

The coccinellid *Hippodamia variegata* (Goeze) (Coleoptera: Coccinellidae) is a relatively recent addition to the North American coccinellid fauna. This species was first reported in 1984 near Montreal, Quebec (Gordon 1987). Since then, its range has expanded beyond northeastern North America with the newest records in the midwestern United States, including Michigan (Gardiner and Parson 2005), Ohio (Pavuk et al. 2007), Wisconsin (Williams and Young 2009), and most recently South Dakota (Hesler and Lundgren 2011). Here we provide the first records of *H. variegata* in Minnesota. In addition, our records further define the movement pattern of this beetle across the Midwest by documenting its presence in the gap between Wisconsin and South Dakota.

Surveys of soybean and sweet corn natural enemies in Minnesota from 2007-2010 provided an indirect way to sample for the presence or absence of *H. variegata* in five different locations in Minnesota. Four locations were University of Minnesota Research and Outreach Centers, and the fifth location (Evansville, MN) was a private soybean farm. Sampling methods for *H. variegata* and other natural enemies varied by year and location but utilized one or more of the following methods: sticky traps, whole-plant visual inspection, ground sampling, and/or sweep net sampling. Sampling was conducted from June-August for each of the locations. Because the purpose of these surveys was not to specifically address abundance of *H. variegata*, we are presenting here the presence and absence data of this species at the five locations and are including only general comments on the abundance of beetles observed. Voucher specimens were deposited into the University of Minnesota Insect Collection.

Sweet corn natural enemy sampling in 2007 and 2008 resulted in no collection of *H. variegata* in Minnesota. The first individuals of *H. variegata* were collected during the summer of 2009 in two locations, the University of Minnesota Outreach, Research and Education (UMORE) Park in Rosemount, MN and the Minnesota Agricultural Experiment Station in St. Paul, MN in both sweet corn and soybean (Table 1). Numerous individuals (>20 beetles) of *H. variegata* were observed and collected over the summer months of 2009 in both crops. During 2010, *H. variegata* was collected from three of four sampling locations in both sweet corn and soybean. No specimens were collected in soybean from Southwest Research and Outreach Center (SWROC) in Lamberton, MN, located in southwest Minnesota; however *H. variegata* was collected from Evansville, MN, located in west central Minnesota.

The results of these surveys demonstrate that the range of *H. variegata* continues to expand in the United States; within two years, we found this coccinellid from eastern to western Minnesota. These surveys also demonstrate that a new predator species has established in two major crops in Minnesota. Perhaps this rapid range expansion was facilitated by abundant food sources such as the soybean aphid (*Aphis glycines* Matsumura) and corn leaf aphid (*Rhopalosiphum maidis* (Fitch)) present throughout the crops we surveyed. One outcome of this establishment, then, could be enhanced natural control of certain prey species, as has been demonstrated with the introduction of the similarly alien coccinellids *Harmonia axyridis* (Pallas) and *Coccinella septempunctata* L. on soybean aphid (Costamagna and Landis 2006, Fox et al. 2004). Alternatively, the introduction of *H. variegata* could threaten already declining

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Table 1. *Hippodamia variegata* Minnesota sampling location information from 2007-2010.

Year	Location	County	Crop Sampled	<i>Hippodamia variegata</i> collected
2007	Rosemount, MN	Dakota Co.	Sweet Corn	No
2008	Rosemount, MN	Dakota Co.	Sweet Corn	No
2009	Rosemount, MN	Dakota Co.	Sweet corn & soybean	Yes
	St. Paul, MN	Ramsey Co.	Soybean	Yes
2010	Rosemount, MN	Dakota Co.	Sweet corn & soybean	Yes
	Becker, MN	Sherburne Co.	Soybean	Yes
	Evansville, MN	Douglas Co.	Soybean	Yes
	Lamberton, MN	Redwood Co.	Soybean	No

native coccinellid populations (Harmon et al. 2007, Gardiner et al. 2009). In sum, however, the longterm impacts of this new species in Minnesota are yet to be determined.

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