

## NOTE

### Establishment of the Rosette Weevil, *Trichosiromachus horridus* (Panzer) (Coleoptera: Curculionidae) in North Carolina<sup>1</sup>

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Thistles in the genus *Carduus* and *Cirsium* rank as the second most common and third most troublesome weeds in pastures and haycrops in North Carolina (Witt. 1990. Proc. of the S. Weed Sci. Soc. Weed Survey - Southern States. 548 pp.). As part of a long-term solution to controlling thistle infestations, the North Carolina Department of Agriculture initiated a biological control program against these weeds in 1990. Shipments of the rosette weevil, *Trichosiromachus* (formerly *Ceuthorrhynchidius*) *horridus* (Panzer), were obtained from Missouri, Tennessee, and Virginia. The weevils were released against musk thistle, *Carduus nutans* (= *thoermeri*) (L.), plumeless thistle, *Carduus acanthoides* (L.), and bull thistle, *Cirsium vulgare* (Savi) Tenore (Table 1). All three thistles are introduced Eurasian species.

In early May of 1992, two weevil adults were collected from a musk thistle plant in Rowan Co., nearly 160 km from our nearest weevil release. These were identified as *T. horridus* by K. R. Ahlstrom, NCDA Insect Taxonomist; voucher specimens are in the NCDA Insect Collection. A survey to determine the distribution of the rosette weevil was made in spring 1993. Starting in Cleveland Co. (which borders South Carolina), the survey extended northward to the Virginia border and westward to the Tennessee border, stopping whenever musk, plumeless, or bull thistle plants were observed. Plants were visually inspected for characteristic feeding damage (necrotic rosette crowns, multiple lateral shoots, and shotholing of leaves) and the presence of *T. horridus* adults. Once weevils were detected in a county, no further observations were made until the survey crossed into a new county.

*T. horridus*-infested thistle plants were found in 18 counties (Alexander, Avery, Burke, Cabarrus, Caldwell, Catawba, Cleveland, Davidson, Gaston, Guilford, Iredell, Madison, Mitchell, Rowan, Stanly, Surry, Wilkes, and Yadkin) of the western piedmont and mountains of North Carolina (Fig. 1). Of the 18

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**Table 1. Releases of the rosette weevil, *Trichosiromachus horridus* (Panzer) in North Carolina as of 1993.**

Year	County	Number
1990	Chatham	300
	Union	300
1991	Cleveland	500
	Madison	1618
1992	Franklin	650
1993	Franklin	350
	Madison	608
	Vance	1500

county recoveries, 16 were made on bull thistle, 1 on musk thistle (Guilford Co.), and 1 on plumeless thistle (Madison Co.). In Cleveland Co., where there is a moderate to heavy musk thistle infestation, there were an average of 4.18 weevil adults per musk thistle plant ( $n = 217$  plants). The inability to detect *T. horridus* at our release sites (other than Madison Co.) is due to the fact that, after release of an aliquot of weevil adults ( $n = 300$ ), it takes an average of 3 years before recovery occurs (McDonald, personal observation).

The distribution of the rosette weevil in North Carolina is thought to have occurred as a result of natural dispersal from Virginia. *T. horridus* was released in Virginia in 1974 (Ward et al. 1974. J. Econ. Entomol. 67: 735-737) and establishment was confirmed by 1977 (Kok and Trumble. 1979. Environ. Entomol. 8: 221-223). By 1981, the dispersal of *T. horridus* in Virginia covered a range of 609 km<sup>2</sup>, and extended its range to 4,345 km<sup>2</sup> by 1985 (McAvoy et al. 1987. J. Entomol. Sci. 22(4): 324-329). At that time, it was recovered from three counties that bordered North Carolina. The rapid dispersal of *T. horridus* in North Carolina confirms earlier observations made in Virginia that the rosette weevil appears to be ideally suited to the climate and availability of hosts in this region.

In North Carolina, rosette weevil populations have increased to the level that permit them to be collected and redistributed to other thistle-infested areas of the state. The availability of these weevils may allow cattlemen, farmers, and landowners a greater range of options with which to control thistles, especially in those areas that are not well managed, and in which other forms of control, such as mowing and spraying, are difficult to implement.

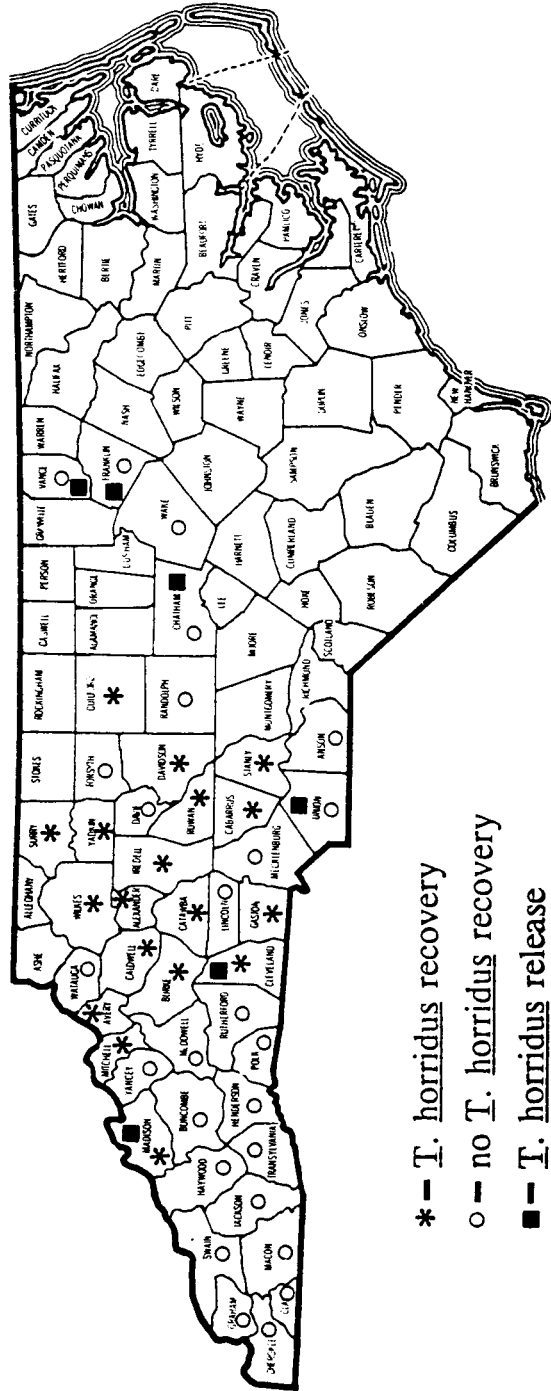


Fig. 1. Distribution of the rosette weevil, *Trichosirolcalus horridus* (Panzer) in North Carolina during 1993.