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## Registration of N-2 Red Clover Germplasm

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**REGISTRATION OF N-2 RED CLOVER  
GERMPLASM<sup>1</sup>  
(Reg. No. GP 11)**

**H. J. Gorz, G. R. Manglitz, and F. A. Haskins<sup>2</sup>**

N-2 red clover (*Trifolium pratense* L.), carrying high levels of resistance to the yellow clover aphid (*Therioaphis trifolii* (Monell)) and the pea aphid (*Acyrtosiphon pisum* (Harris)), was released to researchers and commercial breeders in July 1978. It was developed by five cycles of phenotypic recurrent selection for yellow clover aphid (YCA) resistance and three such cycles for pea aphid (PA) resistance. Thirty-five diverse sources of germplasm, used in the initial evaluations for aphid resistance, were listed previously.<sup>3</sup>

In the initial screening for YCA resistance, 27 plants derived from 13 sources, were selected from an original population of 10,885 plants. After two cycles of recurrent selection for YCA resistance, the YCA-resistant plants selected were cut back,

fumigated, and infested with PA. All subsequent screening tests in the development of N-2 involved the screening of young seedlings for PA resistance, followed by the infestation of PA-resistant selections with YCA after selected plants were cut back and fumigated. Resistant plants selected for propagation were intercrossed at random by honey bees (*Apis mellifera*) in a greenhouse cage, or were transplanted to isolated field plots for interpollination.

Following the fourth selection cycle for YCA resistance and the second for PA resistance, a "resistant composite" was formed that consisted of open-pollinated seed from each of 322 plants. Each of the 27 plants (representing 13 entries) initially selected for YCA resistance could have contributed germplasm to these 322 plants. However, only six maternal sources were represented in the pedigrees of the 322 plants. These sources and the percentages of the 322 plants each contributed were as follows: Chesapeake, 63%; Beltsville Early Flowering Synthetic, 15%; Maryland Selection 67-A2, 10%; Illinois No. 2, 8%; Beltsville Medium Flowering Synthetic, 3%; and Illinois No. 1, 1%. The level of resistance to both aphids in the resistant composite was substantially greater than that in the original germplasm sources. The percentage of YCA-resistant plants increased from 0.3% in the initial screening to 95.6% in the resistant composite (fifth selection cycle). Similarly, PA resistance increased from 27.5% resistant plants in the first screening test (germplasm in this test had undergone two cycles of selection for YCA resistance) to 93.7% in the resistant composite following the third screening test for PA resistance. N-2 is based on 198 plants highly resistant to both aphids that were selected from the resistant composite during the third selection cycle for PA resistance and the fifth selection cycle for YCA resistance. All seed harvested from the 198 resistant plants was bulked to form N-2.

N-2 was developed and released cooperatively by the USDA, SEA, AR, and the Nebraska Agricultural Experiment Station. Small quantities of seed are available upon request from the Department of Agronomy, University of Nebraska, Lincoln, NE 68583.

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<sup>3</sup> Gorz, H. J., G. R. Manglitz, and F. A. Haskins. 1979. Selection for yellow clover aphid and pea aphid resistance in red clover. *Crop Sci.* 19:257-260.