UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Washington, DC

NOTICE OF RELEASE OF 'TRUHART-NR', A ROOT-KNOT NEMATODE RESISTANT, PIMENTO-TYPE PEPPER

The Agricultural Research Service, U.S. Department of Agriculture, announces the release of 'Truhart-NR' pepper [Capsicum annuum L.]. 'Truhart-NR' is a pimento-type cultivar that is homozygous for a dominant gene conditioning a high level of resistance to the southern root-knot nematode [Meloidogyne incognita (Chitwood) Kofoid and White], the peanut root-knot nematode [M. arenaria (Neal) Chitwood], and the tropical root-knot nematode [M. javanica (Treub) Chitwood]. 'Truhart-NR' is being released as a replacement for 'Truhart Perfection,' a widely-adapted and long popular pimento-type cultivar that is highly susceptible to root-knot nematodes. 'Truhart-NR' was developed at the U.S. Vegetable Laboratory, Charleston, S.C., by Dr. Richard L. Fery, Supervisory Research Geneticist, and Dr. Judy A. Thies, Research Plant Pathologist.

In 2000, a recurrent backcross breeding procedure was initiated to incorporate the dominant root-knot nematode resistance gene (N) into the classical pimento-type "Perfection" genetic background. The donor parent of the N resistance gene was 'Mississippi Nemaheart' and the recurrent parent was 'Truhart Perfection.' 'Mississippi Nemaheart' was released by Mississippi State University in 1966. Although 'Mississippi Nemaheart' itself is the product of a recurrent backcross breeding procedure (10 backcrosses) that utilized 'Truhart Perfection' as the recurrent parent, it was never utilized widely by industry because it was considered by many to produce a weak plant. 'Truhart Perfection' was released by the Georgia Experiment Station in 1943; it is susceptible to root-knot nematodes. 'Truhart Perfection' is an inbred selection from the original Perfection cultivar that was released by S. D. Riegel and Sons of Experiment, GA, in 1912. Both 'Perfection' and 'Truhart Perfection' were predominant cultivars for Georgia's large pimento pepper industry for a number of decades following their release; 'Truhart Perfection' is still recommended for use by specialty crop growers in several southern states. The 'Truhart Perfection' accession that was utilized as the recurrent parental line for the current release was derived from a sample of foundation seed increased at the Georgia Experiment Station in 1988. 'Truhart-NR' was derived from a single BC2F3 plant grown in 2006.

'Truhart-NR' is quite similar in appearance and maturity to 'Truhart Perfection.' 'Truhart-NR' has an erect plant habit (height = 59 cm; width = 63 cm) and produces heart-shaped, dark red fruit. The foliage is dense and the fruits are well protected from sun scald. The period from transplanting to first harvest of mature fruit is about 72 days at Charleston, S.C. There is usually one pedicle per axil and the pedicle position at anthesis is pendant. Corolla color is white with yellow throat markings, corolla spots are absent, and the stamens have white filaments and purple anthers. At full anthesis, the length of the style is usually slightly

longer than the stamen. The lanceolate-shaped leaves are medium sized and have a medium green color. The stems and leaves are glabrous. The stems and nodes are green. There is an occasional presence of very slight anthocyanin pigmentation on the stems, slight to moderate pigmentation at the base of branches, very slight pigmentation on the petioles, and moderate pigmentation at the base of the peduncles. The seedling hypocotyl exhibits a moderate amount of pigmentation. The fruits are attached to the pedicle in a pendant manner (typically one fruit per cluster); the calyx margin shape is smooth for ripe fruit (mid-way between smooth and dentate for green fruit); the annular constriction at the junction of the calyx and peduncle is absent; and the pedicles are short to intermediate in length, curved, and thick. The fruits are persistent, i.e., the pedicle and calyx usually remain with the fruit at harvest.

The results of two replicated field studies conducted in 2007 and 2008 at Charleston, S.C., indicate that the fruit and yield characteristics of 'Truhart-NR' are superior to those of 'Truhart Perfection.' Over the two year period, 'Truhart-NR' yielded an average of 16.7% more marketable fruit than did 'Truhart Perfection' (15,116 kg/ha vs. 12,957 kg/ha, respectively). 'Truhart-NR' fruit were also 6.9% heavier, 6.2% longer, and exhibited 4.3% thicker fruit walls. A typical 'Truhart-NR' fruit weighs 67.8 g and is conical- or heart-shaped (5.64 cm wide x 7.36 cm long). The shape of the peduncle attachment end of the fruit is truncate, the neck at the base of the fruit is absent, and the shape at the blossom end of the fruit is pointed. The cross-section of a typical fruit exhibits a slightly corrugated shape. The fruit wall is thick (4.41 mm). The color of immature fruit is dark green; the color of harvest-stage fruits is a deep dark red. The fruits are sweet, and a typical fruit has three locules.

'Truhart-NR' is homozygous for the dominant N gene that conditions a high level of resistance to root-knot nematodes. The new cultivar has exhibited a high level of resistance to the southern root-knot nematode in all greenhouse tests; the numbers of galls and egg masses on the roots have always been minimal. The resistance exhibited by 'Truhart-NR' is equal to that exhibited by the root-knot nematode resistant bell-type cultivar Charleston Belle.

The root-knot nematode resistant 'Truhart-NR' is recommended for use by both home gardeners and commercial growers. It is recommended particularly for use by organic farmers and growers of specialty crops because these segments of the pepper industry do not have easy access to alternative production sites or the needed nematicides and nematicide application equipment. Since the gene conditioning the root-knot nematode resistance trait is dominant, 'Truhart-NR' is potentially a valuable parental line for developing root-knot nematode resistant hybrid pimento-type cultivars. 'Truhart-NR' should perform well in all areas where 'Truhart Perfection' has been grown successfully.

A limited quantity of 'Truhart-NR' breeder's seed is available for pro rata distribution to bona fide pepper seed producers who make a written request by December 15, 2009. Additionally, small trial samples of breeder's seed are available for distribution to all interested research personnel. Address all requests for seed to Dr. Richard L. Fery, U.S. Vegetable Laboratory, 2700 Savannah Highway, Charleston, SC 29414-5334. Genetic material of this release will be deposited in the National Plant Germplasm System where it

will be available for research purposes, including the development and commercialization of new cultivars. It is requested that appropriate recognition of source be given when this germplasm contributes to research or development of a new breeding line or cultivar.

Signature:

K. Simmons

10/20/09

Deputy Administrator, Crop Production and Protection
Agricultural Research Service, U.S. Department of Agriculture

Date