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C-20 Navy Beans

Michigan State University Cooperative Extension Service

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C-20 Navy Beans



- Upright growth habit
- Superior yield performance up to 40 cwt/acre
- Full season maturity
- Excellent seed and canning quality
- Rust and virus resistance
- White mold tolerance
- Uniform maturity and dry down
- Good lodging tolerance

Developed and released cooperatively by Michigan State University and USDA-ARS in 1982, "C-20" navy bean will be available to commercial growers in 1985.

C-20 is a full season upright short vine navy bean variety. It retains the name C-20 under which it was tested as a breeding line out of courtesy to the Campbell Soup Company which initially made the line available to the Michigan State University bean breeding program.

History and Pedigree

C-20 originated from the three-way cross 'JAMAPA'/'NEP-2'//73130-E2-B (W-20/'KENTWOOD') made in 1976. The cross was coded 76706 and advanced to the F₄ generation using single seed descent. Breeding line 76706-D6 was selected as a single F₄

row in Ohio, and reselected as a single F₅ row in Sinaloa, Mexico. In 1980, 76706-D6-B was unconditionally released to the Michigan Agricultural Experiment Station by Campbell Soup Company as an F₇ generation navy bean breeding line coded C-20.

Yield Performance and Maturity

C-20 requires a full season to reach maturity (usually 98 to 104 days), and has exceeded yields of the standard Sanilac, Seafarer, and Fleetwood navy bean cultivars by 22 to 33% over 4 years and 16 locations in Michigan. Similar high yielding performance has been recorded in North Dakota, New York, and Ontario. Potential yields approaching 40 cwt per acre are possible.

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Plant Architecture

C-20 exhibits a type II, upright short vine plant habit; plants average 50 cm tall (about 15 cm taller than Seafarer), are erect and narrow in profile with few basal branches. The modified plant architecture of C-20 should permit growing this variety in narrow rows using direct harvesting.

Disease Resistance

C-20 carries the single dominant hypersensitive I-gene form of resistance to all strains of bean common mosaic virus (BCMV); is resistant to the beta, gamma, and delta races of anthracnose; and is essentially immune to the indigenous rust races prevalent in Michigan, Nebraska, North Dakota, and Colorado. It carries tolerance to the air pollutant ozone, present in

Michigan, to which all standard cultivars are susceptible. C-20 is tolerant to Michigan isolates of halo blight and angular leaf spot and exhibits field tolerance to white mold, and root rot incited by Fusarium.

Seed and Canning Quality

C-20 has an ovoid white seed averaging 20 gms/100 seeds, and is therefore within the acceptable size and shape range of standard navy bean cultivars. Dry seed color as measured by a Hunter color difference meter varies seasonally, ranging from a low of 62.7 to 64.3 on the L scale in different seasons or locations, but its color has always been well within an acceptable range. Canning tests indicate that C-20 produces a cooked product similar to acceptable navy bean cultivars.

Plant Variety Protection

Variety protection has been applied for under the Plant Variety Protection

Act, Public Law 91-577, with the option that C-20 may be sold for seed by name only as a class of certified seed. This provision is expected to better maintain varietal identity and help control serious seedborne diseases such as blight and anthracnose.

Seed Availability

Breeder seed and some foundation seed is maintained in dry, disease-free areas of the Western United States by the Michigan Foundation Seed Association in cooperation with the Michigan Agricultural Experiment Station. Most foundation and certified seed is produced in Michigan although some may also be available from out-of-state.

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