Registration of ‘Nutrasaff’ Safflower


‘Nutrasaff’ safflower (Carthamus tinctorius L.) (Reg. No. CV-27, PI 636440) was developed at the Eastern Agricultural Research Center, Montana Agricultural Experiment Station, Sidney, MT, in cooperation with the Williston Research Extension Center, North Dakota Agricultural Experiment Station, Williston, ND. Nutrasaff was released by the Montana Agricultural Experiment Station in 2004. This cultivar was released as a specialty high linoleic acid content, high oil content, high protein variety to be used as a whole-seed nutritional feed supplement for beef and dairy cattle, poultry, fish, and the bird food markets and as a food and industrial source of high linoleic oil. Nutrasaff was tested as 91B3842 and derived from a single F₃ plant selection from a 1981 multicross involving USB, PI 195895, Cargill 1653, Sidney Selection 87-42-3, and S-541 × a multicross involving Sidney Selection 87-42-3, AC-1, Sidney Selection 88-74-2, N-10, Mexican dwarf-2, ol35-1, PCM-1, and Arizona pigmentless.

USB is a normal hull linoleic acid oil type cultivar with resistance to Phytophthora root rot (caused by Phytophthora drechsleri Tucker) (Thomas and Zimmer, 1971). Cargill 1653 is a white normal hull linoleic acid oil type selection made in California by Cargill, Inc. Sidney Selection 87-42-3 and Sidney Selection 88-74-2 are 1965 selections made at Sidney, MT, for resistance to Alternaria leaf spot (caused by Alternaria carthami Chowdhury) (Bergman et al., 1989b). These selections were made from the 1964 bulk composite of 555 safflower introductions from the 1960 world safflower collection. S-541 was developed by Seedtec International, Woodland, CA, and is a striped hull, linoleic acid oil variety. AC-1 is a linoleic acid oil type cultivar with a purple-striped hull and high seed oil content developed at the University of Arizona. N-10 is a linoleic acid oil variety developed and released by the Nebraska Agricultural Experiment Station in 1953 as an early-maturing variety. Mexican dwarf-2 is a dwarf mutant selection of Indian origin obtained from the USDA-ARS in 1970. PCM-1 is a rust (caused by Puccinia carthami Corda) resistant F₃ selection released by the USDA-ARS, Logan, UT, in 1970 from the cross PI195895 × Frio and possesses the M gene for resistance to Alternaria leaf spot and foliage rust (Zimmer and Urue, 1970).

Recurrent selection for high seed oil content, reduced hull content, high linoleic composition, and Alternaria leaf spot resistance was practiced in the breeding of Nutrasaff. Individual plant selections were made during the F₂ to F₄ generations.

Gas chromatography was used to determine fatty acid composition of the oil in each generation to more than 750 g kg⁻¹ linoleic fatty acid. Nutrasaff is a high oleic safflower oil and reduced hull cultivar having high oil content, higher seed protein content, and lower seed protein content than other safflower varieties.

In addition to its suitability for edible and food applications, Nutrasaff has market potential as a high-ene whole seed supplement to enrich livestock, poultry, and fish diets with high levels of linoleic acid, protein, and omega-3 content.