Registration of N79-2077-12 and N87-2122-4,
Two Soybean Germplasm Lines with Reduced
Palmitic Acid in Seed Oil

Two soybean [Glycine max (L.) Merr.] lines, N79-2077-12 (Reg. no. GP-154, PI 568260) and N87-2122-4 (Reg. no. GP-155, PI 568261) were released in August 1990 and November 1991, respectively, by the USDA-ARS in cooperation with the North Carolina Agricultural Research Service. Concentration of palmitic acid in the seed oil of N79-2077-12 is ~60 mg g\(^{-1}\) oil, and that of N87-2122-4 is ~53 mg g\(^{-1}\) oil. The palmitic acid concentration in oil of standard cultivars is ~100 mg g\(^{-1}\) oil.

The low-palmitic line N79-2077 was derived from the fifth cycle of a high oleic acid recurrent selection population (2). Parents of this population were PI 90406, PI 92567, and N69-2774. The parent line N69-2774 is a maintainer line for the male-sterile gene ms1 (1). It was derived from an outcrossed male-sterile plant that was discovered in a farmer’s field. Thus, the genetic origin is unknown. Seed of a single-plant selection from N79-2077 in 1985 was bulked and grown each year from 1986 through 1990. This line was designated N79-2077-12. Assuming no out-crossing occurred in N79-2077 prior to 1985, N79-2077-12 would be an F\(_9\)-derived line. Average palmitic acid concentration for the four years (1987-1990) was 60 mg g\(^{-1}\) oil (Table 1).

The low-palmitic line N87-2122-4 is an F\(_9\)-derived line from a mating between N78-2245 and N79-2077. N78-2245 is a line with normal palmitic acid, increased oleic acid, and reduced linolenic acid levels. Both N78-2245 and N79-2077 were derived from the fifth cycle of the same high-oleic-acid recurrent selection population (2). Average palmitic concentration of N87-2122-4 for the four years (1987-1990) was 53 mg g\(^{-1}\) oil (Table 1). The parent, N78-2245, had average palmitic acid levels of 100 mg g\(^{-1}\) oil. Compared to N79-2077-12, the seed oil of N87-2122-4 has lower concentrations of palmitic and linolenic acids and a higher concentration of oleic acid (Table 1).

N79-2077-12 has white flowers and grey pubescence. Seeds are yellow, with buff hila and shiny seed coat luster. Average seed size is 17.5 g 100\(^{-1}\) seeds. In a full-season planting in North Carolina for years 1986 to 1989, its average flowering date (18 July) was 3 d earlier than the standard cultivar Essex. The average maturity date (8 October) was equal to that of Essex. The line, N87-2122-4, has purple flowers and grey pubescence. Seeds are yellow, with buff hila and shiny seed coat. Average seed size is 19.6 g 100 seeds\(^{-1}\). On full-season planting in North Carolina for the years 1988 to 1990, its average flowering date (14 July) was 6 d earlier than the standard cultivar Essex. The average maturity date (30 September) was 7 d earlier than Essex. Neither line has been tested for yielding ability.

Fifty seeds each of N79-2077-12 and N87-2122-4 will be furnished for at least five years on request from the Department of Crop Science, North Carolina State University, Box 7631, Raleigh, NC 27695-7631.

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References and Notes


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Registration of N88-480, a Soybean Germplasm Line with a High Concentration of Oil in Seeds

A soybean [Glycine max (L.) Merr.] line, N88-480 (Reg. no. GP-156, PI 568262), was released in November 1990 by the USDA-ARS in cooperation with the North Carolina Agricultural Research Service. This line produces average concentrations of oil (234 g kg\(^{-1}\) seed) and oil concentrations of commercial cultivars in the USA are usually between 205 and 220 g kg\(^{-1}\) seed on a dry-weight basis (1).

The line was derived from a random mating population that had been selected for increased oil concentration. An initial selection experiment begun in 1986 was followed by a second experiment begun in 1988 in a soybean population developed in the first experiment. The line was an F\(_3\)-derived line from the fourth cycle of the selection experiment. Original parents of the initial population were ‘Arksoy’, ‘Ogden’, ‘Lee’, ‘Roanoke’, ‘Jackson’, and N69-2774. Jackson, released by the North Carolina Agricultural Experiment Station Regional Soybean Laboratory, has the pedigree ‘Palmetto’. Volstate was derived from the cross PI54610. The line D60-8107 was an F\(_3\) from ‘Ogden’/PI54610. The parents of D55-4168 were D60-8107, D51-4877, and D55-4168. The parents of Volstate were D51-4877/D55-4168. The parents of ‘Ogden’ were D60-8107, D51-4877, and D55-4168. The parents of ‘Arksoy’ were D60-8107, D51-4877, and D55-4168. The parents of ‘Palmetto’ were D60-8107, D51-4877, and D55-4168.

The line D60-8107 was an F\(_3\)-derived line from the fourth cycle of the selection experiment. Original parents of the initial population were ‘Arksoy’, ‘Ogden’, ‘Lee’, ‘Roanoke’, ‘Jackson’, and N69-2774. Jackson, released by the North Carolina Agricultural Experiment Station Regional Soybean Laboratory, has the pedigree ‘Palmetto’. Volstate was derived from the cross PI54610. The line D60-8107 was an F\(_3\) from ‘Ogden’/PI54610. The parents of D55-4168 were D60-8107, D51-4877, and D55-4168. The parents of Volstate were D51-4877/D55-4168. The parents of N88-480 were D60-8107, D51-4877, and D55-4168.

It was derived from an out-crossed male-sterile plant covered in a farmer’s field. Thus, the genetic origin is unknown. Tokyo, Arksoy, Ogden, Roanoke, and ‘Biloxie’. The parents of N69-2774 were N45-745 and N69-2774. Jackson, released by the North Carolina Agricultural Experiment Station Regional Soybean Laboratory, has the pedigree ‘Palmetto’. Volstate was derived from the cross PI54610. The line D60-8107 was an F\(_3\) from ‘Ogden’/PI54610. The parents of D55-4168 were D60-8107, D51-4877, and D55-4168. The parents of Volstate were D51-4877/D55-4168. The parents of N88-480 were D60-8107, D51-4877, and D55-4168.

N88-480 was tested in the 1990 Regional Preliminary VII Nursery, which was grown at Clinton, NC 27695-7631. The 1990 Regional Preliminary VII Nursery was grown at Clinton, NC 27695-7631. The 1990 Regional Preliminary VII Nursery was grown at Clinton, NC 27695-7631. The 1990 Regional Preliminary VII Nursery was grown at Clinton, NC 27695-7631. The 1990 Regional Preliminary VII Nursery was grown at Clinton, NC 27695-7631. The 1990 Regional Preliminary VII Nursery was grown at Clinton, NC 27695-7631.

N88-480 was tested in the 1990 Regional Preliminary VII Nursery, which was grown at Clinton, NC 27695-7631. This line produces seeds with above average protein content and seed oil concentrations of oil (234 g kg\(^{-1}\) seed) and oil concentrations of standard cultivars is ~100 mg g\(^{-1}\) oil. The palmitic acid concentration in oil of standard cultivars is ~100 mg g\(^{-1}\) oil. The palmitic acid concentration in oil of standard cultivars is ~100 mg g\(^{-1}\) oil. The palmitic acid concentration in oil of standard cultivars is ~100 mg g\(^{-1}\) oil. The palmitic acid concentration in oil of standard cultivars is ~100 mg g\(^{-1}\) oil.