Registration of MD 15 Upland Cotton Germplasm

MD 15 cotton (Gossypium hirsutum L.) (Reg. No. GP-869, PI 642769) was developed by the USDA-ARS, and released in 2005 (Meredith, 2005). MD 15’s unique characteristics are that it possesses enhanced fiber quality characterized by high fiber strength ($T_1$) and low short fiber content. The parents of MD 15 are ‘FiberMax 832’ (PVP9800258) and MD 51ne Okra. FiberMax 832 is an okra 2(L$_2^{0}$) leaf cultivar that was introduced into the US from Australia in 1996. It was grown commercially beginning in 1998 (USDA-AMS, 1998) and in 2005 (USDA-AMS, 2005) it and its transgenics accounted for 4.1% of the US planted hectarage. MD 51ne Okra is an okra leaf BC$_5$ near-isogenic strain developed from ‘MD 51ne’ (Reg. No CV-103, PI 566941, Meredith, 1993). MD 15 was previously designated as MD 120–15, MD 15OP, and MD 15–9. The F$_1$ seed were made in 1996; F$_2$ seed were produced in 1996–97 in Mexico; and planted in 1997 at Stoneville, MS. In 1998, 208 F$_{2:3}$ progeny were evaluated in replicated tests involving four management-soil type environments. Of the 208 progeny, strain 120 produced outstanding fiber quality. Its fiber strength was significantly higher than that of any other progeny or parents ($P < 0.001$).

Strain 120’s fiber strength (302 kNmkg$^{-1}$) was 24.4% higher than that of the 208 progeny population average, 22.2% higher than that of FiberMax 832, and 26.8% higher than that of MD 51ne Okra. Strain 120’s fiber was also long and fine. Strain 120 was variable for the nectariless 2(ne$_1$, ne$_2$) trait. Remnant F$_3$ seed from the original F$_2$ strain 120 plant was grown as individual plants to produce 33 F$_3$ progenies. In 2001, in a four-replicate test, significant genetic variability ($F = 5.76$) for fiber strength was detected. Subsequent evaluations lead to the selection of strain 120–15–9 in F$_6$ being selected as typical of the best fiber quality 120 strains and was designated MD 15.

MD 15 is okra leaf, hirsute, and shows reduced expression of the nectariless trait. Those nectaries that are produced are much reduced in size and expressed later in plant development than those of normal nectaried cottons. MD 15 is classified as mid maturity as its first harvest yield percent of total yield is slightly more than that of FiberMax 832, and its first harvest percent is less than that of the early maturity strain MD 51ne Okra. Plant height determined in 2005 at about cut-out in a replicated study was 1.17m for MD 15, 1.14 for FiberMax 832, and 1.13m for MD 51ne Okra. Average lint percent of MD 15, FiberMax 832, and MD 51ne Okra from five 2004 studies near Stoneville, MS, was 38.5, 39.0, and 38.3%, respectively. Boll weight was 5.0, 5.5, and 4.8 g, respectively and seed weight was 11.6, 11.2, and 10.3 mg, respectively.

In 2003, a select group of 120 strains was compared with their parents in a replicated study at Stoneville, MS. Strains 120–7, 120–15, 120–30, and 120–34 produced fiber strength of 321, 330, 315, and 331 kNmkg$^{-1}$, respectively. Their short fiber content was 3.6, 3.2, 4.0, and 2.6%, respectively. Their parents’ average strength was 224 kNmkg$^{-1}$ and short fiber content was 27% of the parental average strength. Strain 120 was variable for the nectariless 2(ne$_1$, ne$_2$) trait. Remnant F$_3$ seed from the original F$_2$ strain 120 plant was grown as individual plants to produce 33 F$_3$ progenies. In 2001, in a four-replicate test, significant genetic variability ($F = 5.76$) for fiber strength was detected. Subsequent evaluations lead to the selection of strain 120–15–9 in F$_6$ being selected as typical of the best fiber quality 120 strains and was designated MD 15.

MD 15 Okra may be useful to breeders as a source of high yield potential and fiber quality. Seed of MD 15 Okra may be useful to breeders as a source of high yield potential and fiber quality. Seed of MD 15 Okra may be useful to breeders as a source of high yield potential and fiber quality. Seed of MD 15 Okra may be useful to breeders as a source of high yield potential and fiber quality. Seed of MD 15 Okra may be useful to breeders as a source of high yield potential and fiber quality. Seed of MD 15 Okra may be useful to breeders as a source of high yield potential and fiber quality.