Registration of ‘Obatanpa GH’ Maize

‘Obatanpa GH’ (Reg. no. CV-1, PI 641711), a tropically adapted, intermediate maturing, open-pollinated maize (*Zea mays* L.) cultivar was developed by the Crops Research Institute (CRI), Kumasi, Ghana in collaboration with the International Institute of Tropical Agriculture (IITA), Ibadan; the International Maize and Wheat Improvement Center (CIMMYT), Mexico; and the Sasakawa Global 2000 (SG 2000). Obatanpa GH is a white dent and flint endosperm Quality Protein Maize (QPM) with elevated levels of lysine and tryptophan and was first released by CRI, Ghana in 1992 as Obatanpa to help improve the protein nutritional status and the health of a large population of low-income groups in sub-Saharan Africa who depend on maize as a major component of their dietary protein intake.

Maize has such a critical nutritional role to play because it is the most important staple food crop across sub-Saharan Africa. Traditionally, maize is consumed as a starchy base in a variety of forms such as gruels, porridge, and pastes. It is also widely fed as porridge to weaning children (2 to 3 mo, until the children are completely weaned at the age of 15 to 24 mo) and preschool children (3 to 5 yr) without protein supplements. The normal maize has a major nutritional constraint as human food because even though it has about 10% protein, the protein is deficient in two essential amino acids, lysine and tryptophan. The result is that, infants fed on normal maize without any balanced protein supplements suffer from malnutrition and develop diseases such as kwashiorkor, a fatal syndrome characterized by initial growth failure, irritability, skin lesions, edema, and fatty liver. The high lysine content of QPM improves the absorption of Zn and Fe in the human digestive system and may thus contribute to improved micronutrient status.

Obatanpa GH has been widely adopted by farmers and consumers in Ghana. Presently, it covers more than 50% of the maize hectarage (650,000 ha) in Ghana (Dankyi et al., 2005). It has also been released formally or informally in several other African countries including Benin (as Faaba), Togo, Mali (as Debunyuman), Guinea, Burkina Faso, Côte d’Ivoire, Senegal, Cameroon, Nigeria (as SAMMAZ 14), Mozambique (Susuma), Uganda, Ethiopia, Zimbabwe, Swaziland, Malawi, and South Africa (Badu-Apraku et al., 2004). The cultivar is also serving as a source of inbred lines for the development of QPM hybrids and synthetic varieties in several maize breeding programs in Africa. Obatanpa GH has good levels of resistance to the *Maize streak virus* (MSV), lowland rust (incited by *Puccinia polysora* Underw.), and moderate levels of resistance to blight [caused by *Bipolaris maydis* (Nisikado & Miyake) Shoemaker].

Obatanpa GH was derived from Population 63 SR, a white dent QPM, adapted to the lowland tropics. Population 63 SR is a composite of intermediate maturing tropical maize germplasm originally developed by CIMMYT, Mexico. IITA incorporated resistance to MSV into the population. Following multilocation testing of Pop 63 SR in Ghana between 1987 and 1989, the population was identified as a promising source for improved husk cover, grain yield, and agronomic characteristics. The resulting variety was designated Obatanpa which in Ganaian language means “good nursing mother.” Results of multilocation field tests showed that Obatanpa was comparable in grain yield and other agronomic characteristics to the top improved intermediate and late-maturing endosperm maize varieties in Ghana (Twumasi et al., 1997; Sallah et al., 1997). Furthermore, results of feeding tests with piglets and chicken showed that Obatanpa was superior in nutritional value and could be used as an ingredient in animal feeds with economic advantage (Okai et al., 1994; Osei et al., 1994). Obatanpa was superior performance and the elevated levels of lysine and tryptophan, Obatanpa was released for production in Ghana in 1992.

As an open-pollinated cultivar, it has been necessary to upgrade the genetic purity of Obatanpa periodically. For instance, in 2001 the lysine levels of the grains of Obatanpa were found to be low; some plants were observed to be susceptible to the maize streak virus (MSV). An effort to upgrade the lysine and tryptophan content of Obatanpa was initiated during the off-season of 2001 in Ghana. A program was initiated during the major season of 2002 to upgrade the level of streak resistance of the variety. More than 500 families selected from Obatanpa were planted under artificial infection. Two weeks after streak infestation, the streak susceptible plants were rogued out and the streak resistant S0 plants advanced to the S1 stage by selfing under artificial infection. At harvest, about 250 S1 ears selected for desirable kernel modification were planted ear-to-row in a recombination box. The selected kernels of each ear were planted, and advanced to the S2 stage by selfing under artificial infection. At harvest, about 250 S2 ears selected for good husk cover and other desirable characters were recombined to reconstitute the variety during the off-season of 2001 in Ghana. In addition, about 250 S1 ears from each S1 ear were sent to CIMMYT, Mexico for amino acid analyses.

Based on the results from laboratory analyses of the recombined families, 1393 new QPM varieties were selected for high levels of the two essential amino acids. These were advanced to two cycles of recombination with selection for improved husk cover, grain yield, and desirable agronomic characters. The resulting variety was designated Obatanpa which in Ganaian language means “good nursing mother.” Results of multilocation field trials involving five QPM hybrids, six open-pollinated QPM varieties including the new and old versions of Obatanpa, were very promising. The multilocation testing of Obatanpa was superior in grain yield and other agronomic characteristics to the top improved intermediate and late-maturing endosperm maize varieties in Ghana (Twumasi et al., 1997; Sallah et al., 1997). Furthermore, results of feeding tests with piglets and chicken showed that Obatanpa was superior in nutritional value and could be used as an ingredient in animal feeds with economic advantage (Okai et al., 1994; Osei et al., 1994). Obatanpa was superior performance and the elevated levels of lysine and tryptophan, Obatanpa was released for production in Ghana in 1992.

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