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Increasing Farmers’ Involvement in Participatory Breeding of Organic Cotton in India

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Abstract

Seeds of cotton are increasingly difficult to source for organic farmers in India. The reason for this being the wide use of Genetically Modified (GM) cotton, on which breeding and seed production focusses. GM is banned in organic production. There is therefore a need to breed varieties adapted to the organic sector. Participatory Plant Breeding (PPB), meaning breeding which involves farmers in the breeding process, is applied all around the world where market conditions do not provide adequate varieties to farmers. The Seeding the Green Future (SGF) project aims of securing GM-free cotton seeds, safeguarding and improving the germplasm for organic farming systems since 2011 in India through PPB, as PPB is well adapted to the context.

To increase the knowledge base on farmers’ preferred cultivar traits as well as identifying opportunities and challenges in participation to improve the PPB methodology, trainings of farmers in seed multiplication, cultivar evaluation and hybridisation of the SGF project were observed. Furthermore, 53 open ended interviews and 126 structured interviews were conducted with farmers.

Farmers have a broad range of criteria in selecting cotton cultivars, differing between the considered species *Gossypium hirsutum* and *G. arboreum*, between male and female farmers, as well as between different groups of farmers. All quality traits important to the industry (fibre length, strength, and finesse) were mentioned by farmers. That different farmers seek different types of varieties shows the importance of using in-situ, decentralised selections by the target groups of farmers. To do so, farmers need access to segregating material with suitable characteristics based on which they can select their own local varieties. The farmers need more hands-on experience in breeding during the trainings.

To avoid the “sword of Damocles” of GM cotton, local seed production with hand gins is recommended, as farmers complain they cannot get their seeds back from the large-scale ginneries. Storage of seeds is also preferably done locally, either by individual farmers or by farmers’ groups. Furthermore, using *G. arboreum*, which is not yet available as GM, can be used, or alternatively perceptually distinct *G. hirsutum* which are visually distinct from available GM cultivars.

Keywords: Farmer participation, *Gossypium*, organic cotton, participatory plant breeding, plant breeding, PPB

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