Cotton Research and Development in Thailand

PARINYA Sebunruang
(*Senior Cotton Breeder, Nakhon Sawan Field Crops Research Centre Thailand*)

1 Production Situation

Thailand is one of the most cotton importing countries. During 2005-2007, cotton growing decreased from 12,478 ha to 4,679 ha. Consequently, 398,840 million tons of cotton fiber was imported in 2007 for textile industry. A decrease in the growing area was due to low seed cotton price and high cost of pest control, especially for insecticides. Since 2007, seed cotton production has decreased to 996 tons, with average yield of 1.33 tons ha^{-1}. In 2007, number of cotton growers was 10,589, decreasing from 13,540 in 2005. The cotton production cost in 2007 was 468 US$ ha^{-1}, slightly decreased from 496 US$ ha^{-1} in 2005 while seed cotton price increased from 482 US$ ton^{-1} to 594 US$ ton^{-1}, resulting in higher profit to farmers (Table 1).

Table 1 Cotton Production in Thailand During 2005-2007

Characteristic	2005	2006	2007
Number of cotton grower	13,540	12,322	10,589
Growing area (ha)	12,487	4,942	4,679
Seed cotton production (ton)	2,418	1,009	996
Yield (ton ha^{-1})	1.21	1.27	1.33
Cost of seed cotton production (US$ ton^{-1})	496	490	468
Price of seed cotton (US$ ton^{-1})	482	493	594
Profit of seed cotton (US$ ton^{-1})	-2	3	126

Source: Office of Agricultural Economics

The main problem of cotton production was continuous decrease in growing area due to a high cost of production, low profit and competitive crops as well as big pest problem. Thus, farmers grew cotton (*Gossypium hirsutum*) in small areas of less than one hectare per family and for their own use in handicraft textile. Last three years, government's policy encouraged farmers to grow the high-profit crops such as sugarcane and cassava while the requirement of cotton for textile industry increased. Therefore, more than 95% of total demand in cotton fiber was annually imported, especially from USA, China, Australia and India.

At present, most domestic cotton cultivars have medium staple fiber, but some farmers in some areas in the North of Thailand still grow short staple fiber cultivars (*G. arboretum*). Most cotton fiber of them was used for handicraft textile, producing such as clothes, fabric, scarf, pillow case.

2 Cotton research and development

Since 1989**,** breeding project on long staple cotton variety (*G. hirsutum*) had conducted at Nakhon Sawan Field Crops Research Center (NSFCRC), thereafter in 2001 **"Tak Fa 2"** the first long staple cotton variety of Thailand , was released for production. This cultivar has good fiber quality for textile industry with 1.24-inch fiber length, 34 g tex^{-1} fiber bundle strength, 3.4 micronaire fiber fineness, and 47 % fiber uniformity. In addition, this cultivar is resistant to virus leaf roll disease and can generally be grown in cotton areas. It has been used as raw material for handmade fabric industry in Takfa district since 2002, serving government policy **"One Tambon/Subdistrict, One Product" (OTOP)**.


OTOP From Tak Fa 2 Cultivar


However, cotton growing areas in Thailand are still low because cotton requires intensive and good management for insect pest control, especially for cotton bollworm (*Heliothis amigera*). The competitive crops are sugarcane, cassava and maize as they need less management than cotton. Because of a limited scope of insect pest resistant breeding project, cotton breeding research of NSFCRC also focuses on value added fiber by developing natural color fiber cultivar to encourage farmers in growing cotton for their own use in handicraft textile and making local cotton products. Hand-made cotton fabric price is higher than that of synthetic fiber especially in niche market.

Breeding for natural color fiber cultivar began in 2000, the long stable Takfa 2 cotton was crossed with a green and short staple cotton cultivar; thereafter, selection and backcrossing to Tak Fa 2 for four generations was made. In each backcrossing, seed was collected in bulk from green lint cotton plants exhibiting the plant type of Takfa 2. The seeds of BC_4F_1 - BC_4F_5 were then sown for pedigree method of selection. In 2007, only 20 lines with good uniform green-lint yield and plant type were selected, their mean fiber quality indicators were 24% ginning out turn, 1.24-inch fiber length, 22 g tex^{-1} fiber bundle strength, 49 % fiber uniformity. These lines with uniformity in good plant type and green fiber quality will be evaluated for yield potential before release for use.

Due to a serious problem of insect pest damage, growing cotton in a large area is impossible; thus, small area of natural color fiber production for local consumption and hand-made product will be appropriate. Benefit in handicraft textile will encourage farmers to grow cotton.

Handicraft Textile