

QUALITY SEED AND FIBRE PRODUCTION IN EXTRA LONG STAPLE COTTON

K. Rathinavel

Senior Scientist, Central Institute for Cotton Research,
Regional Station, Coimbatore – 641 003

Seed being a vital and basic input for cotton production, its critical role in productivity and quality has been emphasized in the recent years. Consequences of the release of high yielding varieties, hybrids and genetically modified crops, the concept of quality seed usage and precision planting has assumed greater importance. Therefore the quality of planting seed decides the quantity of seed planted in a unit area, which is becoming the costlier input especially in the case of Bt. Hybrids. Optimal use of input and timely operations may render seeds with enhanced quality. In addition to this timely rouging and removal of off-types maintain the genetic purity of quality seed which always possess true characteristics of a particular variety with minimum quality standards of seed certification. The production practices including agronomic and genetic principles are furnished below.

Long Staple Cotton varieties

MCU5, MCU5VT, Surabhi (*G. hirsutum*), Suvin (*G. barbadense*)

Hybrids

Intra-hirsutum: Savita, JK Hy 11,

Interspecific (H x B): Varalaxmi, DCH.32, HB 224, TCHB213, Sruthi, DHB 105, NHB-12, Savithri, Phule 388, Kashinath, NHB-80, Bhagyalakshmi, RHB-0388, ABH 4208, CBS 156, KCH-1

Bt. cotton hybrids

RCH 20 (HxH), MRC 6918 (HxB), RCHB 708 (HxB), Kasinath (HxB), NCHB 992 (HxB), NCS 990 (HxB)

Presowing seed management

Before sowing, treat the delinted/fuzzy seeds with chemicals or bio inoculants individually or in combination, as per the requirement. The recommended seed treatments are Carbendazim @ two g/kg of seed, Thiram @ two g/kg of seed, Talc formulation of *Trichoderma viride* @ 4 g/kg of seed, Delinted seeds may be slurry treated or coated with polymers along with Imidachloprid or thiamethoxam @ 5-10 g/kg, Delinted and fungicide treated seeds may be treated 600 g of Azospirillum inoculant and sown immediately for the maximum beneficial effect.



Technologies for the enhancement of seed and fibre quality

1. Effect of sowing time on quality of hybrid seed

- Sowing of parents of cotton hybrids Savita, Surya, Sruti, Kirti, HB 224, LHH 144, NHH 44 in the middle of August and late August / September results in higher hybrid seed yield than the sowing early August
- Boll setting percentage was high in late sown crop (late August/September) than the early sowing.

2. Effect of spacing and micronutrient spray on quality of seed

- Sequential foliar application of seed crop with diammonium phosphate 2 %, $MgSO_4$ 1 %, boron 0.1 %, $ZnSO_4$ 2 % at 45, 50, 60, 75 days after sowing, respectively, enhanced seed cotton and seed yield followed by the seed quality characters.
- Higher seed cotton and seed yield can be obtained in 120 x 60 cm spacing than the spacings of 90 x 90 cm, 105 x 90 cm and 120 x 90 cm .

3. Effect of Detopping and defoliation treatment on seed yield and quality

- Detopping alone or in combination with spray of defoliant can increase seed cotton yield.
- Detopping at 120 days followed by spraying of ethrel @ 450 g a.i. acre⁻¹ at 160 days after sowing increases seed cotton as well seed yield.

4. Effect of soaking and foliar treatment on quality of seed

- Soaking of cotton seeds in succinic acid @ 0.2% solutions improve field emergence 4 – 7 per cent.
- The seed soaking treatment enhances the plant stand establishment to the extent of 98%
- Fuzzy and delinted seeds can be stored for a period of sixteen months under ambient condition.
- Soaking of cotton seeds in succinic acid @ 0.2% before sowing followed by foliar application of hormone NAA @ 10 ppm on 60 and 75 days in seed crop produces high quality cotton seeds.
- soaking of female parent seeds in succinic acid @ 0.2 % for six hours before sowing and pollination up to five weeks from flower initiation and simultaneously foliar application of boron @0.1 % at 60 DAS, $MgSO_4$ 1 % at 75 DAS or Foliar application of boron @ 0.1 % at 60, 75 & 90 DAS alone was good for production of high quality hybrid seed.



5. Effect of supplemental foliar nutrients on seed yield and quality

- Foliar application of DAP @ 2 % + Boron @ 0.6 Kg/ha + Zinc @ 0.5% together on 70, 90 and 110 days can improve seed quality and seed yield.

6. Extension of shelf life of cotton (*Gossypium hirsutum*) seeds

- Seed coating using polymer @ 5 ml kg⁻¹ found optimum and this improved germination and field emergence.
- A simple coating of polymer @ 5 ml kg⁻¹ or polymer with carbendazim @ 2 g kg⁻¹ or polymer + carbendazim + imidacloprid increased the germination and seedling vigour.
- Seed treatment with imidacloprid @ 5 g kg⁻¹ alone or coated with polymer @ 5 ml kg⁻¹ + carbendazim @ 2 g kg⁻¹ is effective in control of sucking pests up to 45 days after sowing
- Coating of seeds with polymer @ 5 ml kg⁻¹ or polymer + carbendazim @ 2gkg⁻¹ or polymer + cabendazim @ 2 g kg⁻¹ + imidacloprid @ 5 g kg⁻¹ in combination extended seed viability and quality for a period of sixteen months.
- Coating the seed with polymer (a liquid based pink colourant, easily water soluble, fast drying and biodegradable) @ 3 ml/ kg along with thiram @ 2.5 g/ kg, super red @ 5 ml/kg and cruiser @ 5 g/kg is the best treatment for ambient storage conditions.
- LRA 5166 cotton seeds treated with neem leaf powder @ 10 g kg⁻¹ and Surabhi seeds treated with neem kernal powder @ 10 g kg⁻¹ (botanical based) extended the storage life of seeds for 32 months.
- The fuzzy seeds dry dressed with a mixture of calcium oxychloride and calcium carbonate (3:1) @ 5 g kg⁻¹ and iodine vapours impregnated in the calcium carbonate @ 3g kg⁻¹ and kept in airtight container under ambient condition for seven days had increased the seed vigour and viability, irrespective of age of seeds and reduced the pathogenicity of stored seeds.

7. Enhancement of planting quality of seed through sequential coating

- Cotton seeds coated with polymer (10g kg⁻¹) with Turmeric rhizome powder (20g kg⁻¹) + Arappu leaf powder (50g kg⁻¹) + Thiram (2g kg⁻¹) + Neem leaf powder (20g kg⁻¹); or polymer (10g kg⁻¹) with Thiram (2g kg⁻¹) + Neem leaf powder (20g kg⁻¹) + Turmeric rhizome powder (20g kg⁻¹) + Arappu leaf powder (50g kg⁻¹); or polymer (10g kg⁻¹) with Neem leaf powder (20g kg⁻¹) + Turmeric rhizome powder (20g kg⁻¹) + Arappu leaf powder (50g kg⁻¹) + Thiram (2g kg⁻¹) are more viable, produce vigourous elite seedlings, which can withstand even under adverse field situations and more productive.

