

Alternative farming practices from cotton to sorghum



No creature, not even swine, befouls its nest with such abandon as does homo sapiens, poisoning his habitat with fiendishly concocted chemicals and their deadly toxic waste. A morass of rotting human flesh awaits us all unless the antidotes are rapidly applied. Providentially, they exist, they work and can bring us back to health.

- Quoted in the book "Secrets of Soil"

AME Foundation promotes ecological agriculture among small and marginal farmers in the semi arid areas of the Deccan Plateau by generating farming alternatives, enriching farmers knowledge, linking development agencies and sharing experience.

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AME Foundation

No. 204, 100 ft. Ring road, 3rd Phase,
Banashankari 2nd Block, 3rd Stage, Bangalore 85
Ph: 080-26699512, 26699522 Fax: 91-80-26699410
amebang@giasbg01.vsnl.net.in;
amefbang@amefound.org Website:amefound.org



Nagalapur in Raichur district is a small village consisting of 140 households. Majority of them are small farmers belonging to Lingayat, SC and Madivala communities. Situated at the tail end area of the Tungabhadra canal project, some have access to irrigation. However, for the last five years, the village has not received any water from this source, making the farms completely rainfed. Sorghum, cotton and sunflower are the major crops. The black soil areas prevailing in the village, however, make it ideal for growing cotton. Cotton is grown under monocropping system. Increasing use of purchased inputs has made cotton crop less remunerative.

In the year 2004, the Raichur Unit of AME Foundation, discussed with farmers, the issues related to prevailing farming situation. To start with, it conducted grama sabhas and motivated farmers to join hands for improving their land and livelihoods. Following repeated such interactions, 12 of them, majority being small farmers, came forward to form an eco-farmers group - *Sri Utakanur Basaveshwara Samagra Besaya Abhivruddi Gumpu*. The members set their own norms for group functioning including regular savings by members. The group meets twice a month regularly to discuss farming activities, learn from each other and adopt suitable practices.

Knowing that the primary concern of the farmers were primarily concerned about the declining profitability in cotton, AMEF initiated interventions in the cotton crop to start with. Heavy and indiscriminate usage of chemicals in cotton, necessitated the promotion of ecofriendly practices. FFS, being one of the most effective participatory methodologies, was conducted as an entry point during 2004 cropping season. **Basavarajappa Gouda** is a member of the ecogroup and an active participant in FFS. Following is an account of the way Basavarajappa changed to alternative farming practices in cotton.

Basavarajappa is a small farmer from Lingayat community aged 38 and had schooling upto fourth standard. He belonged to a joint family consisting

of 12 members. Besides, working on their own farm, the family members also work for wages to meet the household needs. In lean periods, male members of the family migrate to nearby cities in search of work.

Basavarajappa owns 4 acres of dry land. He cultivates cotton, sorghum and sunflower. He has been growing cotton as a mono crop, the most common practice in the region. Common practice is to apply farm yard manure once in three years while chemicals like Urea, DAP and Complex fertilizers are applied every season at the rate of 50 kg per acre. Seeds are bought from the retail shops and directly sown in the field. Generally, 5-6 pesticide sprays with chemicals like Monocrotophos, Endosulfan, Quinolphos are used both as preventive and curative measures. With all these practices he was harvesting about 5 quintals of cotton per acre, on an average.



Basavarajappa setting up an insect trap

Moving to alternative farming practices

Basavarajappa is an active member in the group. He participated in the FFS and earmarked one acre of his land to practice various alternative farming practices. He learnt ways of dealing with cotton crop by understanding its ecosystem.

The piece of land allotted to FFS was ploughed during summer to capture the early rains. This was followed by ploughing the land thrice before sowing. Farm bunds were repaired and inter-bunds were made to retain the soil moisture better. *Jatropha* and *glyricedia* were planted on the bunds, for two purposes. One to protect the bunds and second, to generate additional plant biomass to be converted to organic manure. Sheep penning was done to enrich the soil.

Breaking the mono cropping pattern, other crops like red gram, lady's finger and cowpea seeds were included with cotton. Red gram was used as a border crop, lady's finger and cowpea were scattered in the main crop, as trap crops. Pest management activities started right from seed

treatment. Seeds were treated with *Trichoderma* and *PSB* before sowing. Neem leaf extract, which has pesticidal properties, was sprayed thrice at an interval of 15 – 20 days. Chemical sprays were now restricted to two, that too during the peak incidence of bollworm in the month of September.

With alternative eco-friendly practices, Basavarajappa was able to harvest 8 quintals of cotton, a marginal increase of 6.25% over his usual practice plot. However, his biggest gain was in terms of drastic reduction in production costs, due to lower usage of chemicals. Fertiliser usage declined by 60% (applied only 50 kg of Complex fertiliser as against 150 kg of all kinds of fertilisers) and pesticide usage declined from 6 sprays to 2 sprays. With the reduction in chemical use, there was significant reduction in the cultivation costs too – fertiliser cost by 39%; pesticide cost by 77%; total cost reduction by 38%.

Crops other than cotton became a source of food for the family - one quintal each of red gram along with lady's finger, and 30-35 kilos of cowpea were harvested, which was utilized for home consumption.

Other significant gains which Basavarajappa realises is the gain in his knowledge level with regards to pest management. With FFS training, he is now able to recognise and names of useful insects like Ladybird beetle and Chrysopa.

Extending the learning

The FFS in cotton was followed by a number of trainings on sustainable agricultural practices, for instance, on rain water management, soil fertility enhancement and crop management aspects. All these realisations resulted in a change in outlook towards farming. Particularly after realizing the benefits from the cotton crop, the Basavarajappa's group members extended some of the practices to other areas, and to other crops as well. Certain soil moisture conservation practices such as summer ploughing, preparing bunds and inter-bunds, pest preventive measures like seed treatment are now being followed beyond the trial plot.

Costs and returns in Cotton (Rs/acre) - 2005				
S.No	Activity	Control plot	Trial plot	Difference (%)
1	Production cost			
	Land preparation	600	600	
	Manures and fertilizers	1650	1000	- 39.4%
	Seeds and seed treatment	700	715	
	Pest and disease management	2380	550	- 76.9%
	Labour	1050	1050	
	Total	6380	3915	-38.6%
2	Yield (kgs)	750	800	6.25%
3	Gross returns (Rs)	16500	17600	6.66%
4	Net returns	10120	13685	35.22%

Benefits from cotton cultivation motivated group members to try alternative farming practices in a food crop like sorghum. Sorghum was being grown as a subsistence crop, primarily for home consumption. Sorghum crop never received much attention in terms of building soil fertility or in pest management. With AMEF's guidance, Basavarajappa adopted certain alternative farming practices. Land was ploughed across the slope to retain the soil moisture. About 20 cartloads of farmyard manure was applied. Safflower was grown as a border crop to protect sorghum from cattle grazing and bengal gram as an intercrop. The seeds of sorghum and bengal gram were treated with *PSB* before sowing. Sorghum seed rate was reduced to two kilos from the usual three kilos. Following optimum spacing, Basavarajappa observed that the reduced seed rate helped in maintaining a better plant population. This in turn enhanced plant growth with bigger ear heads. The size of the stem and leaves was almost double the size of those in the control plot. As a plant protection measure neem extract was sprayed twice to control the aphids.

By following alternative practices, the cost of cultivation increased, primarily due to additional land ploughing and application of purchased FYM. However, with Basavarajappa producing organic manure on his own farm, it is anticipated that the cost would reduce gradually.

Costs and returns in Sorghum (Rs/ac) - 2005				
S.No	Activity	Control plot	Trial plot	Difference (%)
	Ploughing	400	2000	400%
	FYM	-	900	
	Seeds and seed treatment	94	65	-30%
	Labour	880	880	
1	Production cost	1374	3845	179%
2	Yield - kgs	400	900	125%
3	Gross returns	2400	7410	208%
4	Net returns	1026	3565	247%

Despite the high cost of production, Basavarajappa was able to get higher net returns. He harvested 9 quintals of sorghum, which was double than what he was getting before. The fodder yield also doubled from a level of 2 tons/ac to 4 tons/ac. Additionally, he got 60 kilos of Bengal gram and 60 kilos of safflower, which yielded 9 kilos of oil.

Basavarajappa and the eco group members are totally convinced about the enhanced productivity with low cost alternatives compared to their own methods. Other farmers in the village who have been observing these positive changes are coming forward to be a part of the group. For instance, Andhra farmers residing in the nearby Nagalapur Camp, expressed interest to join the group. Some of them look to the group members for technical guidance, in carrying out these practices on their own farms. The members of *Sri Utakanur Basaveshwara Samagra Besaya Abhivruddi Gumpu*, have been thus successful in stimulating the interest of farmers in the region in adopting alternative agricultural practices for the better.



Basavarajappa and his family on his farm