

## Alternative farming practices for remunerative dryland Cotton

The farmers were able to harvest 12-13 quintals of bajra per acre and about 2 quintals of red gram. Having understood the usefulness of the intercrops and the new variety of bajra, farmers have stored the seeds for the next season. This will be distributed among the members of the group and the other farmers who are interested. Similarly, group members took up kitchen gardening by growing brinjal, cucumber, tomato and ridge gourd, seeing one another.

Convinced by the benefits of adopting the sets of combinations of sustainable alternative agriculture practices in dry farming, the group members under the leadership of Pratap Reddy have been spreading it to other farmers in the village and around. Pratap Reddy is a role model for many farmers now, in his village and the region.

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*Despite the many accomplishments of mankind, we owe our existence to a six-inch layer of top soil and the fact that it rains.*

- Confucius

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**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.

December 2006

### AME Foundation

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Cotton is the major cash crop in Gadhar, a village in Raichur Taluk, having 450 households. Most of the farmers in the village depend on drylands for their livelihood, while a few have irrigation from open wells. Mono cropping has been in practice not only in this village but also in the entire region. Cotton, which was highly remunerative a few years ago, has gradually become less profitable with its heavy dependence on purchased inputs. Farmers use inputs mainly guided by the input dealers. Also, farmers procure loose seeds from the vendors for sowing directly in the fields. Over the years, the production costs in cotton have increased, soils have lost their strength and yields have begun to decline.

### Towards a change

Taking note of the problems regarding the farm livelihoods in the region, Raichur Area Unit of the AME Foundation, selected this village to help the farmers to move towards sustainable crop production by adopting alternative farming practices, reducing the external inputs. The concern of the farmers was about the declining yields and returns, particularly in cotton, the major cash crop of the area. To begin with, grama sabhas were conducted and several discussion sessions with farmers were held. Discussions revealed that pest incidence, particularly sucking pests and bollworm, was the major factor affecting cotton yields. To manage the pests, at present, on an average, the crop is sprayed nine times during the crop period of which five were aimed at controlling *Heliothis*, and the rest against the sucking pests. On an average, the cotton crop yielded 3.5 qt/ac, which was much below its normal potential of 6 qt/ac.

There were other factors affecting the yields, like poor seed quality, delayed sowing, improper soil and water management practices and inadequate organic manure application. But this was not adequately realised by the farmers as the constraints. Observing this, AMEF interacted with the farmers in a systematic manner, to influence the cotton growers, through their representative groups willing to adopt alternative practices.

As a result, 19 cotton farmers, interested to adopt alternative farming practices, that are eco-friendly, came together to form an eco farmers group. This was *Sri Kudala Sangameshwara Samagra Besaya Abhivridhi Sangha*, formed in October 2004. Regular meetings, savings and proper record keeping helped in strengthening the cohesiveness of the group. The dynamic leadership provided by the group leader, Shri. Pratap Reddy, was a source of strength.

AMEF strongly believes that to bring about changes in the present practices in crops like cotton, it is not just enough to offer formal training and advocate new practices. It is important to change the existing mindset of farmers and help them to look at farming in its totality. Farmers had to learn to look at their crop in relation to the existing crop ecosystem and not in isolation. Hence, Farmer Field School (FFS), a discovery learning process, was considered to be most appropriate means. FFS was conducted in the cropping season of 2005, from June to December. All the group members showed keen interest in the FFS sessions, which was an entry point for interventions in other crops, later. Majority of the farmers have now changed the production practices in cotton crop based on their FFS learnings.

Here is an account of the performance of **Shri Pratap Reddy**, as an illustration of the result of AMEF's intervention in general and FFS in cotton in particular. This case highlights the efforts of an individual farmer in adopting alternative practices and sharing them with others in the group and beyond.

**Pratap Reddy**, aged around 35, has done his formal schooling up to SSLC. He belongs to Lingayat community, is married and has two children. He owns 16 acres of land and manages it with the help of hired labour.

Pratap Reddy has been growing cotton for quite some years. For him, cultivating cotton involved a number of routine activities like sowing the seeds directly brought from the seed dealer, applying pesticides the moment he observed the insects on the crop, and applying fertiliser as a standard practice. As a member of the group, Pratap Reddy was an active participant in the Cotton FFS. He used a plot of size 0.75 ac. for

FFS events. On 0.50 ac., the cultivation practices followed were as per the decisions in the FFS group and in 0.25 acre, the cultivation was according to his normal farming practices, as a control. From the experiments laid out, as a part of FFS, he learnt a lot about alternative farming practices in cotton.

### Alternative farming practices adopted

Redgram was sown as a border crop, marigold seeds were scattered and lady's finger seeds were sown in a ratio of 1:10 on the field. All the seeds were treated with biologicals prior to sowing.

**Seed treatment:** The method of seed treatment with biologicals and the difference it could make in crop production was an important learning. Seeds were treated with *phospho bacteria* and *azospirillum* before sowing. The details of seed treatment method used by him is given in the box.

**Pest management:** Trap crops like redgram, marigold and bhendi were grown to manage pests like *heliathis* and *spotted bollworm*. He learnt about the role of useful insects like *Trichogramma*, an egg parasite on *heliathis*. He had no idea that there could be some insects, which could benefit his crop. NPV, a bio agent and one chemical pesticide were sprayed once as a precautionary measure. The earlier practice was to spray pesticide whenever a larva or an insect was noticed in the field. These new measures helped in reducing the pesticide sprays from 9 to 4 during first year and from 4 to 1 spray during second year.

#### Seed treatment method

For 750 gms of cotton seed:

- ▶ 20 gms of jaggery
- ▶ 50 gms of Phospho bacteria
- ▶ 50 gms of Azospirillum

Spread the seeds on a sheet or sack; pour the jaggery syrup over the seeds and dust the bio-agents. Allow them to dry under shade for half an hour and sow them directly.

(Though recommended dose of bio-fertilizers is 200 g per acre of seeds, while treating, farmers felt that 50 g was enough to treat the quantity of cotton seeds per acre).



Pratap Reddy on his farm

The usage of pesticide reduced by 75% which was a major expenditure in the past.

**Nutrient management:** Earlier, applying fertilisers and pesticides was more like a competition among the farmers. If one farmer used 10 bags of fertilizer, the neighbour would apply 12 bags. For the first season, Pratap Reddy did not reduce fertiliser application, but increased it with additional quantities of FYM from 2 tons/ac to 3 tons/ac and with vermi compost (2 q/ac). At present, he has also started supplementing fertiliser with compost, which he has learnt to prepare, on his own farm.

### Cotton becomes remunerative again

Alternative practices have increased the cotton yield by 20% and the net returns by 44% in the very first year of transition from chemical farming to alternative, eco-friendly practices. The cost of production increased owing to his application of on purchased organic manure. As Pratap Reddy has started producing organic manure on his own farm, the cost of production is likely to be reduced in the coming years.

| Costs and Returns in Rs/ac |                          |             |          |              |
|----------------------------|--------------------------|-------------|----------|--------------|
| S.No                       | Item                     | Farmer plot | FFS plot | % difference |
| a                          | Input cost               |             |          |              |
|                            | Seeds and seed treatment | 280         | 290      |              |
|                            | Organic manures          | 1500        | 2650     | 76.6%        |
|                            | Fertilisers              | 555         | 555      |              |
|                            | Pesticides               | 1030        | 240      | -75.2%       |
|                            | Botanicals               |             | 304      |              |
|                            | Total                    | 2365        | 4039     | 70.7%        |
| b                          | Labour cost              | 2475        | 2250     | -9.0%        |
| 1                          | Production Cost          | 5840        | 6289     | 7.6%         |
| 2                          | Yield (kg)               | 500         | 600      | 20.0%        |
| 3                          | Gross Returns            | 9800        | 12000    | 22.4%        |
| 4                          | Net Returns              | 3960        | 5711     | 44.2%        |

### Towards holistic farming system

Regular interaction with AMEF and the internal discussions in the group, convinced Pratap Reddy to focus on natural resource management and recycling his farm wastes. During one of his study tours to LEISA farms, Reddy got convinced that additional plant biomass was crucial for producing more organic manure on the farm. Subsequently, he raised 10000 multipurpose seedlings for generating plant biomass. He planted them on field bunds and on the sides of the pond. He has also planted some horticultural crops like mango, tamarind and sapota. Having understood the importance of plant biomass, Reddy stopped the practice of burning the sunflower stalks and other crop residues. Instead, he incorporates them into the soil.

Pratap Reddy has also taken up certain support activities like vermi-composting and kitchen garden. He has grown brinjal, cucumber, tomato, ridge gourd near his home and lady's finger in the cotton field. He feels he has sufficient vegetables for his home use now. He has dug a farm pond of 12 feet depth to conserve water. He plans to rear fish in future, based on the water availability in the pond.



Preparing vermicompost on the farm

Changing over to alternative farming practices is a slow process. Pratap Reddy achieved this by starting with cotton crop and gradually expanding it to include natural resource management.

The **crop-centric focus** in the beginning helped in bringing farmers together in addressing their immediate problem of increasing farm income and reducing production costs. The focus of AMEF's interventions however was not just centered around a single crop. It extended to aspects like rainwater management, building soil fertility and adopting suitable cropping patterns. Gradually through discussions and training, AMEF succeeded in changing the mindset of farmers, enabling them to look at farming in a holistic manner.

The **group approach** of AMEF resulted in more number of farmers adopting chosen alternative practices in farming. The group dynamics has helped in building confidence in farmers in taking up new practices. For instance, bajra variety ICTP-8203 was introduced, six members of the group cultivated along with red gram and castor as inter crops.