

Azolla as a Low Cost Fodder

AMEF Foundation is born out of a concern for ecological agriculture. Embedded in this concern are the livelihood improvements and ecological balances. Choosing to work with resource poor families in fragile ecosystems of dry farming, AMEF seeks to enable them to generate and adopt alternative farming practices, that are acceptable and affordable.

Sustainable agriculture (SA) in dry lands requires adoption of a bunch of practices pertaining to rainwater conservation, soil fertility improvement, diversified crop production systems, along with rebuilding of environmental support.

*Over the years, AMEF has found certain alternative farming practices highly accepted by farmers. Such practices are considered here as Good Agriculture Practices eligible to be widely disseminated. **This good agricultural practice pertains to livestock maintenance through azolla cultivation.***

AMEF firmly believes that while farmers alone are the practitioners of these options, as end users, there are several agencies working with them as enablers. This brief seeks to help the enablers to promote SA in their specific context.

The farmers in dry lands in Southern India are resource poor and low in income status. Dairying is one of the allied agricultural activities, which farmers are practicing to increase their farm income. Maintenance of livestock is becoming expensive due to scarcity of fodder in rural areas. Commercial feed is costly to afford by the small and marginal farmers.

Some desirable cropping practices like mixed cropping with fodder crops are eroding due to intensive, monocropping practices. Therefore, alternative practices to support the livestock assume greater significance under dry land conditions. Low cost alternative like *Azolla*, an aquatic floating fern having fodder value for livestock, is becoming popular among the small and marginal farmers.

Cultivation

Farmers adopt temporary and permanent structures to cultivate azolla in their farms. It is grown in a temporary shallow pit of convenient sizes. Mostly farmers make the pits of size, 2.25 m length, 1.5 m width and 15 cm depth. The pit is given an inner lining with poly sheet of 150 GSM thickness. A mixture of sieved fertile soil and cow dung slurry (4 to 5 kg) is added and filled with water to the ground level. One kg of azolla mother culture is added which multiplies in 10 to 12 days period. A water level of at least three inches is maintained in the pit. The water is changed at least once in two weeks while soil and dung is replaced once in two to three months. Regular

removal of diseased and decayed fern is done to maintain azolla in healthy condition.

Unlike in temporary method, permanent structure is built above the ground with the help of bricks. A tank of size 2.4 m length, 1.5 m width and 30 cm depth is constructed with a thin layer of concrete to avoid seepage of water. The cost incurred to construct such structures is Rs.1170.

Many farmers have experienced that azolla grows well under partial sunlight. So, they provide partial shade to azolla avoiding direct sunlight (S D Kololagi). They also cultivate it under natural shade like tree cover with plastic mosquito net to avoid leaves falling onto it.

Azolla is ready for harvest in a fortnight. It can be fed to the milch animals and calves of age six months and above, once or twice a day. Harvested azolla is soaked for two to three hours and washed in clean water before feeding to animals and poultry birds. It is fed @ 1 kg per animal for cows and buffaloes and, 250 g for small ruminants and 100 g for poultry birds. *Azolla* is fed with dry fodder to animals and directly to poultry birds after washing.

Azolla contains 24-26% crude protein, 9% fiber, 9% fat and micronutrients. Dried azolla powder contains 25-35% fat, 10-15% minerals, 7-10% amino acids, carotenes and vitamin B12. As lignin content in azolla is less, animals digest it easily. It contains more crude protein than fodder obtained from the cereals (7 to 9%).

Farmers have observed additional milk yield in cows to the extent of 0.5 liter per day and increased fat content in milk after feeding continuously for 15 days. It is also learnt that feeding azolla to the animals improves the grazing habit and digestion capacity.

The problem of availability of green fodder through out the year creates interest among the resource poor farmers to adopt the azolla cultivation, as it requires less time and negligible cost. Fodder crops are taken up in the cropping season to be used as dry fodder while azolla is used as green fodder through out the year. Farmers are getting additional income of Rs. 300 per month as a result of increased milk yield in animals and reduced purchase of commercial cattle feed.

Azolla, belonging to family *Azollaceae*, hosts symbiotic blue green algae, *Anabaena azollae* which is responsible for the fixation and assimilation of atmospheric nitrogen. Hence, it is also used in paddy crop as green manure and to control the weeds. In the state of Andhra Pradesh in Southern India, farmers have

experienced better growth in paddy crop with azolla over control. *Azolla* being a good source of biomass to the soil, an average of 1.50kg per sq m has been recorded. *Azolla* is a low cost fodder, which can be grown through out the year by the resource poor farmers. It is easy to adopt requiring little or no labour for maintenance.

AME Foundation is promoting azolla as an income generating activity to support the ecological agriculture among the resource poor farming community.

Limitations

Farmers have experienced that animals are reluctant to eat azolla, initially, as it has got “*not so pleasant*” smell since it is grown using dung slurry. It is soaked and washed with clean water before feeding by mixing with rice bran or any other cattle feed. Once the cattle get habituated to azolla, it can be fed directly.

Reference

1. Kololagi S D, 2007. *Azolla - Januvarugalige Puraka Aahara. Krishi Munnade.* 20 (12): p 12



Cultivating Azolla



Azolla in paddy