

Azolla: The super plant

for sustainable feed production

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Low-cost azolla cultivation under the Farmer FIRST Programme in the tribal areas of Kasdol block in Chhattisgarh has proved to be a successful model in the villages. More than 37 azolla production units were set up in the backyard of the beneficiaries. Around one kg of azolla was harvested within 10 to 15 days of inoculation. Azolla serves as an excellent alternative feed and hence saves around 20% of the poultry feed of the poor farmers in the region.

Key words: *Azolla*, FFP, Low-cost, Poultry feed, Tribal villages

AZOLLA is a free-floating, rapidly growing aquatic fern on the water surface. It floats as small, flat, compact green mass. Under ideal conditions it grows exponentially, doubling its biomass every three days. There are at least eight species of *Azolla* worldwide; *A. caroliniana*, *A. circinata*, *A. japonica*, *A. mexicana*, *A. microphylla*, *A. nilotica*, *A. pinnata* and *A. rubra*. The common species of *Azolla* in India is *Azolla pinnata*. It produces more than 4 to 5 times of protein of excellent quality in comparison to lucern and hybrid napier. Besides this, the bio-mass production is almost 4 to 10 times when compared with hybrid napier and lucern, respectively. Hence *Azolla* can be rightly called the “super plant” as it is vital in improving livestock production (Fig. 1).

Azolla is an excellent alternative to concentrates/fodder/feed, thereby providing a sustainable feed for livestock. It contains most of the nutrients which are required for all classes of livestock, including poultry and fish. *Azolla* can be fed to these animals without any adverse effects. Various studies revealed that feeding of *azolla* to dairy cows increased milk production by 15 to 20% and also improved the weight of broiler

chicken and increased the egg production in layers. Hence *azolla* can be used as an unconventional high potential feed resource for non-ruminants. Above all, for the best performance diets pullet chicks can be formulated with the inclusion of *azolla* up to 10%. *Azolla* can be used as an ideal source of feed for cattle, sheep, goats, pigs, rabbits and fish as an alternate source to a concentrate/feed/fodder to improve the production status of the animals.

Azolla is very rich in proteins, essential amino acids, vitamins (vitamin A, vitamin B₁₂, Beta Carotene), growth promoter intermediaries and minerals including calcium, phosphorous,

potassium, ferrous, copper, magnesium. On a dry weight basis, *Azolla* has 25-35% protein content, 10-15% mineral content, and 7-10% comprising a combination of amino acids, bio-active substances and biopolymers.

Focus area: Small, marginal, landless and resource-poor tribal farmers.

Challenges: Rocky and rainfed area lack the availability of green fodder for livestock, mono-cropping, very low level of knowledge/adoption of soil and water conservation technologies, inability to higher investment, resource-poor and subsistence farming, lack of green fodder for livestock.

Table 1. Performance Indicators

Technical Observation	Farmers practice	Intervention
Yield (q/ha)		
Grain/ Azolla per unit		3.65 Quintal/unit/year
Straw	First time introduced	-
Economic indicators		
Cost of cultivation (₹ /unit)		620/year/unit
Net income (₹ /unit)		3,030
B:C ratio		4.88
Farmers reaction		
	<ul style="list-style-type: none"> First time seen by farmers and produced for poultry, livestock and rice field as low-cost feed. Very less investment and management All farmers were excited and happy to adopt this technology, in the upcoming days it will reach to maximum farmers 	



Fig. 1. *Azolla* the super plant, that contents 4-5 times more protein than hybrid napier

Extension method adopted: In order to enhance the soil health, to increase the productivity of different crops and to make available feed for poultry and livestock in the villages, low-cost *Azolla* cultivation structure was demonstrated to the villagers. In this technology, a small water tank was constructed at the farmers' backyard and farm by digging a pit of $1 \times 3 \times 0.20$ m and covered with a plastic lining. It is then covered with fertile soil and made a thick layer. The tank was then filled with water to a height of 10 cm and then mixed with 3-4 kg of cow dung slurry. After completing the tank preparation, a small quantity of *Azolla* was inoculated and spread in the tank. Around one kg of *Azolla* was harvested after 10-15 days of inoculation.

Impact and lessons learnt: In a

short period of time, it became popular among the farmers and they established more than 37 *Azolla* production units. The technology requires less investment and management, easy to establish and does not require any special expertise. Now farmers are producing sufficient quantity of *Azolla* and feeding their cattle, goat and poultry. Most of the farmers were economically weak and were unable to purchase quality poultry and goat feed. They found *azolla* as an excellent alternative feed and thereby saved 20 % cost on poultry feed. Integration of the *Azolla* tank with poultry shade is a very good and successful model at the tribal villages.

Economics: Total production $1.0 \text{ kg per day per pit} \times 365 \text{ days} = 365 \times ₹ 10 \text{ per kg} = ₹ 3650 \text{ income/year/family generated}$.

CONCLUSION

Production of *azolla* requires less investment and management and does not require any special expertise. The technology, supported under the FFP, has proved successful to many farmers in the area and acted as an alternative to the expensive livestock and poultry feed.

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