Available online at
www.agrospheresmagazine.vitalbiotech.org

ISSN (E): 2582 – 7022

Agrospheres:e-Newsletter, (2022) *3*(9), 5-8

Article ID: 430

Azolla: A Plant with Great Potential

Jeetendra Singh Bohra[1*], Anuj Kumar[2], Keshav Singh[3]
Uttarakhand Biotechnology Council, Department of Agriculture, Haldi, U. S. Nagar, 263145

*Corresponding Author
Jeetendra Singh Bohra*

Article History
Received: 7.08.2022
Revised: 11.09.2022
Accepted: 18.09.2022

INTRODUCTION

Azolla is a aquatic fern which floats freely on the surface of water. Basically it grows in fresh water, naturally available mostly on moist soil and is widely distributed in tropical belts of India. Its leaves are small in size and overlap on each other. Mostly this plant is used because of its great speed of growing and doubling its biomass within 3-10 days and fixes atmospheric nitrogen by forming symbiotic relation with the blue-green algae *Anabaena azollae*.[1] The length of roots for azolla is around 1-2 cm and the leaf size is about 1-2 cm. Species of Azolla live in areas where there is a lot of water like lakes, streams and other small water bodies. Its six species distributed widely throughout warm temperate and tropical zone. Some strains of azolla can fix 2-3 kg of nitrogen/ha/day. It contains around 27% protein, 10% carbohydrate [2]. *Azolla* has the capability to take nitrogen from the atmosphere and get convert it as a fertilizer for soil.It means that it is able to produce bio-fertilizer, livestock, food and biofuel exactly where they are needed. It also draw down large amounts of CO_2 from the atmosphere, thus helping to reduce the threat of climate change.

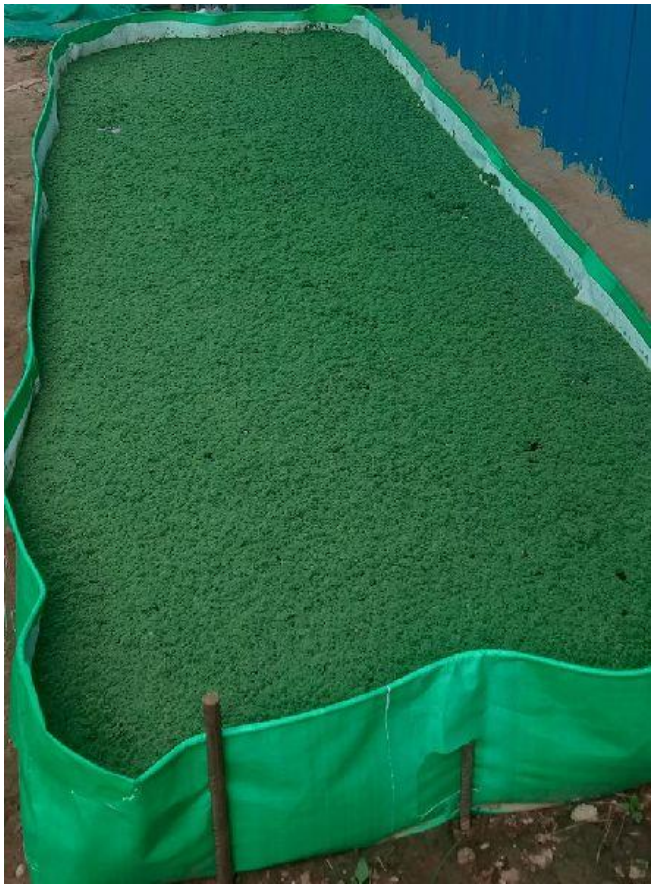
BENEFITS OF AZOLLA:

As a Biofertilizer: Biofertilizer are the fertilizer that improve the soil by many ways that are not improved by chemical fertilizer. Plants are mainly required nitrogen as their growth. Nitrogen improves the soil fertility. Azolla has a high nitrogen content that's why nowadays it is very much useful as a biofertilizer. Although earth's atmosphere contains large amount of nitrogen. Some plants are able to take nitrogen directly from the atmosphere and most plants obtain their nitrogen from complex compounds in the soil. Azolla takes nitrogen directly from the environmental.

ISSN (E): 2582 – 7022

As a green manure: Azolla can be used as a green manure in the cultivation of water bamboo, arrowhead, wheat etc. It grows very fast.

As feed for livestock : Azolla is very reach source of nutrients which are essential for all classes of livestock including cow, poultry and fish. The azolla can be supplied to these animals without any harmful effects. According to varies studies, feeding of azolla to cows in dairy increases milk production by 15 to 20 per cent. Feeding of azolla in poultry birds improves the egg production in layers. Azolla is very rich source of protein, amino acid, minerals, vitamins etc. It can be used as a substitute 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. [2,5]. That is the main reason to use azolla in dairy in a large scale.



As a weed controller-: Azolla plant grows and floats on the surface of the water so it forms a thin layer on water surface. So it uses for weed control in paddy farm. In paddy farm azolla works as organic mulching which does not allow to produce weed.

Reduce the water evaporation rate-: Azolla is very fast growing aquatic plant. Mostly it grows and floats on the surface of water. It creates a thin layer on the surface of water, which is very much reduce the evaporation rate of water.

Commercially useful for farmers-: farmers basically search and grow such plants which needs less investment for farming and can give more benefits. Azolla is one of such plants because it requires less investment, less space is sufficient to start farming, productivity is always high because of its great speed of growing**.**

<u>Environmental Requirements for azolla growth</u>

The ecology of azolla is still obscure. The gross environmental requirements of azolla are so interrelated that it is often difficult to single out any one r a combination of factor-:

- **Temperature-:** Day/night temp ranging between 32^0C and 20^0C have found to be most favourable. The optimum temp for luxurious growth of azolla is 25-30^0C
- **Water-:** fresh water to a height of 10cm-15cm is necessary in multiplication pond.Maintenance of adequate water level (atleast 5 cm) is essential.
- **Light-:** Cultivation of azolla prefers to grow well under partial shade. So the pond should be establish under shade**.**
- **Relative humidity-:** the optimum relative humidity requirement is 85-90%
- **Soil ph-:** The optimum ph range of azolla is slightly on the acidic side of 4.5-7.0. Maximum growth are possible at ph 6.5. The ideal ph is 5.5.

ISSN (E): 2582 – 7022

Azolla farming Process-:

There are a lot of different techniques but the widely used technique is known as pond method.

Following are the required steps in this technique-

- A pond is created with a depth of 8-9 inches and the bottom is properly cleared and levelled. A plastic sheet of required dimension is spread over the land and properly secured.
- 10-15 kg fertile soil is spread over the sheet.
- A mixture of 10 L water and 1 kg cow dung is spread uniformly over the sheet.
- 10-20kg powdered rock phosphate is added to maintain the nutrient level.
- Fill the pond with fresh water to a height of 10cm.
- Approximately 1kg of azolla mother culture is inoculated in the pond and 20gm of micronutrients are added to improve the mineral content.
- 1kg azolla can be harvested each day after 10-15 days of inoculation.
- To keep up the multiplication rate of the azolla 10gm of rock phosphate and 500gm of cow dung should be added after every 5 days to the pond. weekly micronutrient mixture should be added to maintain the mineral level in the pond.
- It is recommended to replace the bad soil once in a month.
- Water in the pond also should be replaced once in every 10 days to keep the azolla fresh.

CONCLUSION

Increasing population and reducing land threatened mankind by drastic global environmental changes. The time has come when we need to think deep about all this happened. Numerous applications of Azolla like Bio fertilizer, biogas, livestock feed can play a significant role to maintaining the environmental globally. Azolla has the potential to maintain the environmental change but the only need is to exploit it in a more efficient manner in the future. Therefore basic and advance research should be taken towards to making azolla more useful. Azolla is less labour intensive so research can inhance its agriculture, industrial amd environmental use. In conclusion we can articulate that Azolla has enormous potential for being a source of income for farmers. Its low investment makes it one of the best commercial businesses. Overall we can say we need to develop alternative strategies for conducting our affairs.

REFERENCES

Purushottam Subedi and Jiban Shrestha, Improving soil fertility through Azolla

application in low land rice: A review Azarian Journal of Agriculture, (2) ISSUE 2, 2015:35-39

Roger S.V. Pullin, Gaudiosa Almazan Azolla as a fish food.

Importance of Azolla as a sustainable feed for livestock and poultry - a review. Agricultural Reviews. 2012. (33):93 – 103

Waseem Raja et al./ International Journal of Research in Biological Sciences 2012; 2(2): 68-72

K Giridhar, et al Cultivation and use Azolla as nutritive feed supplement for the livestock National institute of animal nutrition and physiology , Bangalore, Karnataka 560030 Indian farming 62(2): 20-22 May 2012