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Cultivation and Steps of Azolla culture

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INTRODUCTION OF AZOLLA:-

Azolla/mosquito fern/duckweed fern/ fairy moss/water fern is free floating aquatic ferns and is genus which belongs to family Saiviniaceae. Live symbiotically with Anabaena azollae, a nitrogen-fixing blue-green algae. It grows in fresh water and is naturally available mostly on moist soils, ditches marshy ponds and is widely distributed in tropical belts of india. A main stem growing at the surface of the water, with alternate leaves and adventitious roots at regular intervals along the stem. Azolla fronds are triangular or polygonal Float on the water surface individually or in mats. Size(dia.)-ranges from 1/3 to 1 inch (1-2.5 cm) to 6 inches (15 cm) or more.

Structure of Azolla:-

Shape of Indian species is typically triangular measuring about 1.5 to 3.0 cm in length 1 to 2 cm in breadth. Roots emanating from growing branches remained suspended in water. The dorsal lobe which remains exposed to air is having a specific cavity containing its symbiotic partner, a Blue Green Algae (BGA), the Anabaena azollae. The fev is capable of fixing atmospheric nitrogen in the soil in the form of NH4+ and becomes available as a soluble nitrogen for the cultured species.

Classification (Taxonomy)

Kingdom: Plantae

Division: Pteridophyta

Class : Polypodiopsida/Pteridopsida

Order: Salvinales

Family: Salvinaceae

Genus: Azolla

Sub Genus: Eu-Azolla

chemical compositions of Azolla:

S.no.	Constituents	Dry matter(%)
1.	Crude protein	24-30
2.	Crude Fat	3.3-3.6
3.	Nitrogen	4-5
4.	Phosphorous	0.5-0.9
5.	Calcium	0.4-1.0
6.	Potassium	2-4.5
7.	Magnesium	0.5-0.65
8.	Manganese	0.11-0.16
9.	Iron	0.06-0.26
10.	Soluble sugar	3.5
11.	Crude fire	9.1
12.	Starch	6.54

Requirements for growth :-

- Azolla is naturally found in ponds, ditches and wetlands of warm temperate and tropical regions throughout the world.
- It requires light for photosynthesis and grows well in partial shade. Generally, Azolla needs 25 to 50 per cent of full sunlight for its normal growth.
- Water is the basic requirement for the growth and multiplication of Azolla and is extremely sensitive to lack of water.
- The species vary in their requirement of ideal temperature. In general, the optimum is 20° C to 30° C. Temperatures above 37 ° C will seriously affect the multiplication of Azolla.
- The optimum relative humidity is 85 to 90 per cent.

- The optimum pH is 5 to. Too acidic or alkaline pH has an adverse effect on this fern.
- Azolla absorbs the nutrients from water. Though all elements are essential, phosphorus is the most common limiting element for its growth. About 20 ppm of phosphorus in the water is optimum. Micronutrient application improves the multiplication and growth.

Steps of Azolla culture

Selection of location for the pond :-

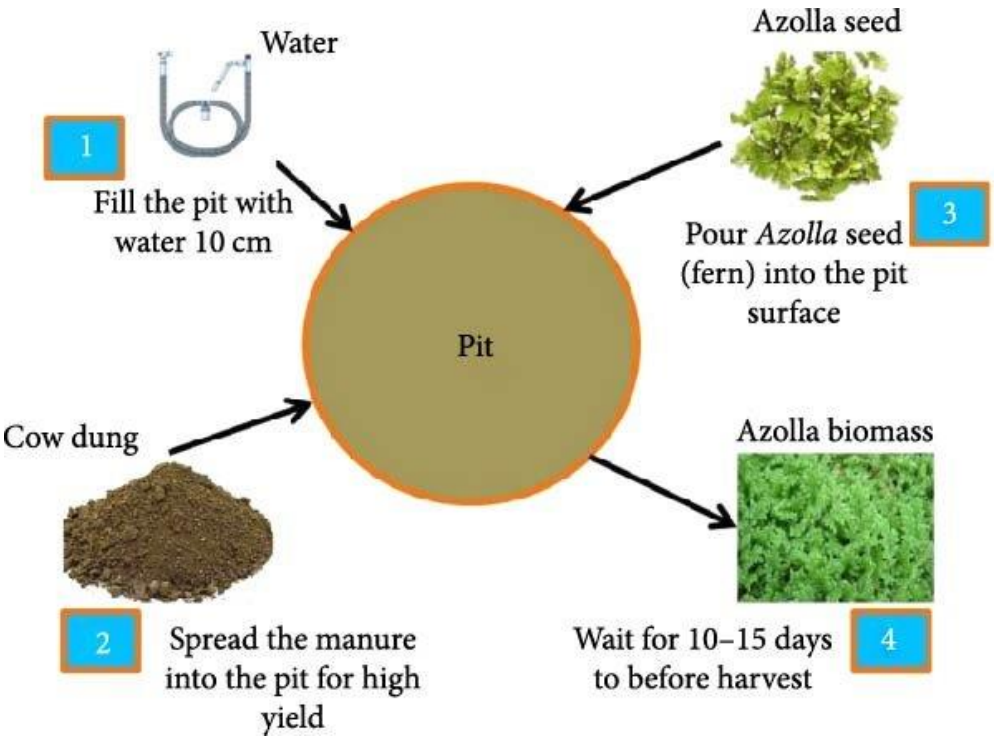
- Select an area near to the house to ensure regular upkeep and monitoring of the pond.
- A suitable water source should be nearby for regular water supply. The site under partial shade.
- The floor area of the pond should be free of pointed stones, roots and thorns.
- Land should thoroughly prepared and levelled uniformly.

Material required for preparation of one pit:-

- Plastic sheet (21 x 3 m²)
- Healthy Azolla qulture (8-10 Kg.)
- Soil (80-100 Kg.)
- fresh dung (10 Kg. In 20 Ltr. Water)
- Net (1 m²)4 446444
- SSP(100 gm.)
- Carbofuran 3G(100 gm.)

Method of production of Azolla :-

- For One Hectare of land, prepare 4 pits having size 20 m x 2 m x 0.25 m and cover it with plastic sheet and press the edge by the soil.
- Lay 80-100 kg soil per puniformly on the floor.
- Make a solution of fresh cow dung and put it on the soil surface with the help of sieve.
- Fill the plot with 5-10 cm of water.
- Inoculated with Azolla (8-10 Kg).
- Sprinkle with 1-2 litres of water so that the roots get settled.
- Single super phosphate (100 g) in 2-3 split doses is applied at an interval of 4 days to each plot.



Maintenance of Azolla :-

- Maintain 5-10 cm water level in the pit.
- Keep fertile soil at 30 days intervals.
- Put dung solution at a 15-day interval.
- When the problem of pest appears, add 100 grams of Carbofuran 3G per pit after 7-8 days.
- Any litter or aquatic weeds seen in the pond should be removed regularly.

The pond needs to be emptied once in six months and cultivation has to be restarted with fresh Azolla culture and soil.

Harvesting of Azolla :-

- After15-20 days, the thick layer of Azolla will develop having weight about 100-150 Kg.
- Harvest the two-third of Azolla and use it in the rice field.
- Leave for one-third of Azolla's part for reproduction in the pit.
- After 15 days,one can harvest 3 Kg. of Azolla per day.

Uses of Azolla :-

- In rice field as dual cropping and green manuring.
- Used as cattle feed.
- Used as bio-fertilizer in Organic farming.
- Food for fishes.
- Food for pig, goat, poultry and other livestock.

Note:- In case of livestock feed, Azolla should washed 4-5 time with fresh water.

yield of Azolla:-

Azolla produces around 8-10 tonnes of Green mass which is equal to 25-30 kg N_2 which is again equal to 55-66 kg of urea).

Limitations of azolla cultivation :-

- Water is pre-requisite for it's multiplication. so it is not suitable for upland crop.
- Huge quantity of inoculums is required which is difficult for transplanting action during rainy days.
- Temperature more than 35°C is not suitable.
- Extreme how temperature is also not suitable.
- Non availability of technology to use Azolla as dry inoculum.
- Non availability of varieties suitable for higher temperature with !ow pH application.
- Initial cost of cultivation is high.
- Market for azolla is not so popular.

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