

Azolla based fish farming in pond

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About Azolla: It is a fern type smaller floating plant used as feed by the herbivore fishes. It is available almost all the geographic locations of the country. Since Azolla is rich in nitrogen content, the cost of chemical fertilizer can be reduced by azolla application to a greater extent in pond. Soil fertility can also be increased through its use as organic fertilizer. One hectare land fully covered with azolla produces 10-15 tons of raw organic fertilizer and 20-25 kg of nitrogen (equivalent to 45-55 kg of urea fertilizer). Azolla can be supplied to the fishes through collection from nature. It can also be produced in ponds/ditches/canals/rice fields easily through preparing the Azolla bank.

Pond selection: Important considerations are: round the year water availability of the pond; good water holding capacity of the pond soil; pond surface well exposed to sunlight (sunlight penetration for 8-10 hours); mud layer of the pond bottom not exceeding six inches; good facility

Pre-stocking pond management: emphasis should be given on pond remodeling (in terms of inlet and outlet facilities and repair of the embankments) to protect from flood water entrance or to drain the excess water (in case of emergency); staffing with grass on the embankment so as to protect soil erosion (specially in red soil area); deweeding; and removal of predatory and unwanted fishes/animals.

After 3 days of predatory fish removal, liming should be done to remove clay turbidity and to disinfect the pond water (CaO@1 kg/decimal) for normal soil. Ash treatment (ash @15-30 kg/decimal) including liming (CaO@ 2-3 kg/decimal) is required for red soil. After seven days of liming, fertilization (organic fertilizer/compost @10kg/decimal, urea @ 250g/decimal and TSP @ 250g/decimal) should be done to produce plankton in pond water; after five days of fertilization azolla bank should be developed to supply sufficient azolla in the pond.

Development of azolla bank: Around 10% of fish free water area of the pond is separated by bamboo fencing to keep the compost for maintaining azolla layer round the year. Fresh Azolla seeds are inoculated @ 100-200g/m² or 4-8 kg/decimal (considering both for pond area and

compost area) over the compost area. The favourable temperature for the growth/reproduction of Azolla is between 25-30°C.

Fish stocking: After 10-20 days, stocking (Fish size between 3 and 5 inches) should be done subjected to the sufficient production of azolla.

Fish species	Stocking density (Number/decimal)	
	Model-1	Model-2
Catla (<i>Catla catla</i>)	06	08
Silver carp (<i>Hypophthalmichthys molitrix</i>)	08	06
Rui (<i>Labeo rohita</i>)	04	04
Grass carp (<i>Ctenopharyngodon idella</i>)	03	03
Raj punti/Sarpunti (<i>Barbodes gonionotus</i>)	10	10
Kalibaus (<i>Labeo calbasu</i>)	-	06
Mrigel (<i>Cirrhinus mrigala</i>)	06	-
Carpio (<i>Cyprinus carpio var. communis</i>)	03	03
Total	40	40

Post stocking pond management: Liming can be done periodically (CaO@100-250g/decimal/fortnight for normal soil). In addition to lime application, ash treatment (ash@5-10 kg/decimal/fortnight) is required for red soil. Application of organic fertilizer (Cowdung/compost @200g/decimal/day) and inorganic fertilizer (TSP@10g/decimal/day) are required for smooth supply of azolla round he year. Usually there is no necessity of supplementary feed application during availability of sufficient amount of azolla in the pond. During unavailability of azolla, supplementary feed (rice bran-50% and mustard oil cake-50%) can be given @3-5% of fish body weight.

Fish harvesting: The SIS fishes can be harvested after 3-4 months of stocking, on the other hand, larger size carps can partially be harvested and replaced by stocking.

Precaution: Increase in temperature is harmful for azolla, therefore, there should be provision of shading over the azolla bank for it's smooth production.