

## EFFECT OF AZOLLA APPLICATION ON GRAIN YIELD OF RICE

*Azolla* is a water fern that fixes atmospheric nitrogen in association with nitrogen fixing blue green alga, *Anabaena azollae*. Nitrogen fixation by azolla-anabaena complex is considered to be a potential biological system for increasing rice yield at comparatively low cost (Kannaiyan, 1982). The utility value of azolla for rice production in India was reviewed by Kannaiyan (1979) and Singh (1979). Watanabe *et al.* (1977) have established the potential ability of azolla nitrogen fixation around 1.1 kg N/ha per day. Singh (1979) reported that a layer of azolla covering a hectare of rice field contain about 10 t green matter and ensures about 25 to 30 kg N/ha. Azolla can be used effectively as dual cropping with rice to supply nutrients after the formation of a mat either by natural decomposition or by incorporation into the soil (Kannaiyan, 1982). Azolla inoculated at 0.2 kg/m<sup>2</sup> (Kannaiyan *et al.* 1981) on 7th day after planting was found to establish and cover the area in 15 to 30 days. Azolla was incorporated in the rice field during first weeding after draining the water completely (Kannaiyan, 1981). The effect of azolla application was compared with incorporation of lemna, water hyacinth and farm yard manure on grain yield of rice and the results are reported hereunder.

A field experiment was conducted during Samba season (Sept. 1981 to Jan. 1982) with IR 20 rice variety. The levels of fertilizer nitrogen 30, 60 and 90 kg N/ha with and without azolla inoculation have been tried. Potassium and phosphorus were applied both at 50 kg/ha as basal. The experiment was conducted in randomised block design with four replications. The green leaf manures lemna, waterhyacinth and azolla were incorporated to the plots two days prior to transplanting at the rate of 10 t/ha. Farm yard manure was applied at 5 t/ha. Azolla was inoculated as dual crop at 200 g/m<sup>2</sup> on 7th day after transplanting. The inoculated azolla multiplied and covered the entire experimental plots in 15 days after inoculation. The first azolla incorporation was done on twenty five days after planting. The left over azolla during first incorporation was multiplied well within 25 days after first incorporation and second incorporation was done on 25 days after first incorporation. The grain yield was recorded. The results are presented in Table 1. Highest grain yield of 5081 kg/ha was recorded in plots treated with 60 kg N/ha along with azolla inoculation followed by 90 kg N/ha plus azolla inoculation (5057 kg/ha). The increase in fertilizer nitrogen along with azolla inoculation has influenced the grain yield very much. Among the treatments, azolla incorporation has recorded higher grain yield followed by lemna, waterhyacinth and FYM incorporation respectively. The results have clearly indicated that azolla was effective as green manure when compared to other treatments. Also azolla has significantly increased the grain yield of rice when used as dual crop. The effective utilization of azolla as green manure and dual crop has been well documented by Lumpkin and Plucknett, (1980), Venkataraman (1980) and Kannaiyan, (1981). Govindarajan *et al.* (1979) reported that inoculation of *Azolla pinnata* at 300 g/m<sup>2</sup> as dual crop with rice and incorporation of azolla twice have shown significant increase in grain

yield of rice which was equivalent to that of 25 kg fertilizer nitrogen per hectare. The results have clearly shown the positive rice crop response to azolla biofertilizer and other green manures.

Table 1

Effect of azolla and certain green manures on grain yield of rice crop

Treatments	Grain yield (kg/ha)	% increase over control
Un-inoculated control	2477	—
30 kg N ha alone	3540	42.91
30 kg N/ha+ azolla	4160	67.94
60 kg N ha alone	4337	75.39
60 kg N ha + azolla	5081	105.12
90 kg N/ha alone	4533	83.00
90 kg N/ha+azolla	5057	104.15
Azolla 10 t/ha	4234	70.93
Lemna 10 t/ha	4057	63.78
Waterhyacinth 10 t/ha	3904	57.61
Farm yard manure 5 t, ha	3630	46.54

CD (0.05) = 497

### സംഗ്രഹം

നെൽവയലുകളിൽ 'അസോള' ജൈവവളമായി ഉപയോഗിക്കുന്നത് മറ്റു പച്ചിലവളങ്ങളെക്കാൾ കൂടുതൽ ഫലപ്രദമാണെന്ന് തമിഴ്നാട് കാർഷിക സർവകലാശാലയിൽ നടത്തിയ ഈ പരീക്ഷണങ്ങൾ തെളിയിക്കുന്നു.

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