

Fertilizer Application for Rice

The following schedule is recommended per acre :

Nutrients (kg/acre)					Fertilizers (kg/acre)	
N	*P ₂ O ₅	*K ₂ O	**Urea (46% N)	***DAP or (18% N 46% P ₂ O ₅)	*Super- phosphate (16% P ₂ O ₅)	*Muriate of potash (60% K ₂ O)
50	12	12	110	27	75	20

These nutrients can also be supplied from the other fertilizers available in the market (Appendix IV)

* Apply only when the soil test shows deficiency of these nutrients See Chapter on Soil Testing.

** Make appropriate reductions for green-manuring and farmyard manure and pressmud applied.

*** When DAP is used, reduce the urea dose by 10 kg.

**** To save irrigation water, irrigate with tensiometer installed at 15-20 cm soil depth at soil matric tension of 150+20 cm or when water level in tensiometer enters yellow strip.

***** For N, urea or neem-coated urea can be used.

Apply 1/3 nitrogen, the whole of phosphorus and potassium before the last puddling. Broadcast the remaining nitrogen in two splits, one three weeks after transplanting and the other three weeks afterwards. Phosphorus can be top dressed upto 21 days after transplanting. Skip phosphorus application to rice if recommended dose of phosphorus had been applied to the preceding wheat crop. If possible, apply the second and the third split doses of nitrogen when water is not standing in the field. Irrigate on the third day of the application of fertilizer.

Reduce nitrogen dose by one-third while burying summer moong after picking pods one day before transplanting. "Use Leaf Colour Chart (LCC) for need-based nitrogen fertilizer application to rice. Apply a basal dose of 25 kg urea/acre at the last puddling. Match the colour of youngest fully expanded leaf (second from the top) of 10 randomly selected disease-free rice plants/hills from each field with the colour strip of the LCC every 7-10 days starting from two weeks after transplanting of rice till initiation of flowering. Every time the greenness of 6 or more out of 10 leaves is less than the shade 4 on the LCC, top dress 25 kg urea/acre. If the colour of five or more out of 10 leaves is greener than the shade 4 on the LCC, do not apply urea to rice. Always compare colour of the leaf with LCC under shade of your body. Need based nitrogen management using LCC holds good for all the prevalent rice varieties grown in all type of soils. Use LCC for applying nitrogen to rice also when fields are amended with organic manures. LCC can be purchased from Head, Department of Soils Science, Punjab Agricultural University, Ludhiana.

Caution : *Excessive use of nitrogenous fertilizers particularly during flowering causes sterility and consequently heavy reduction in yield.*

Zinc Deficiency : The symptoms of zinc deficiency appear 2-3 weeks after transplanting.

The lower leaves become rusty brown near the base and ultimately dry up. The seedlings with zinc deficiency remain stunted and tillerless. To control this malady, apply 25 kg of zinc sulphate heptahydrate or 16 kg zinc sulphate monohydrate per acre at puddling in case previous crop in this field had shown the symptoms of zinc deficiency. Where the deficiency is noticed in the growing crop, apply this quantity of zinc sulphate as soon as possible. In highly deteriorated soils, the symptoms of zinc deficiency sometimes appear in patches even after the application of the recommended dose of zinc sulphate. In that event, broadcast 10 kg of zinc sulphate heptahydrate or 6.5 kg zinc sulphate monohydrate per acre mixed with an equal quantity of dry soil on the affected patches.

Iron Deficiency : Under scarcity of water, chlorosis among seedlings appears in the youngest leaf about three weeks after transplanting. Plants die and often the crop fails completely. Start giving copious irrigations as soon as chlorosis appears and give 2 or 3 sprays of one per cent ferrous sulphate solution at weekly intervals (1 kg of ferrous sulphate in 100 litres of water per acre).

Cultivation in Alkali Soils :

- (i) **Addition of Gypsum** : Add as per the soil test report and give one or two heavy irrigations.
- (ii) **Preparation of Seed bed** : Do not puddle, because water intake rate in these soils is very low. Irrigate the tilled field and give a light planking to pulverize the clods if any.
- (iii) **Transplanting** : Transplant seedlings a week earlier than the normal time of transplanting, because the initial growth of plants in alkali soils is slow. Plant three or four 40 days old seedlings per hill. More seedlings per hill are recommended because of higher mortality in these soils.
- (iv) **Fertilizer Application** : Apply 20-25 per cent more nitrogen than in normal soils. Alkali soils are low in organic carbon and the efficiency of nitrogen fertilizer in these soils is also low. Add 60 kg of nitrogen through 130 kg of urea per acre in three splits, 1/3 at transplanting, 1/3 three weeks after transplanting and the remaining 1/3 six weeks after transplanting. Apply the same amount of phosphorus as to the normal soils. In addition, apply 25 kg of zinc sulphate heptahydrate or 16 kg zinc sulphate monohydrate per acre during the preparatory tillage.
- Where *dhaincha* is grown for green manuring, add the quantity of P_2O_5 recommended for rice to this legume and omit the application of phosphorus to the succeeding rice crop.