

**PACKAGE OF PRACTICES
FOR CROPS OF PUNJAB**

**RABI
2022-23**



**Punjab Agricultural University
Ludhiana**

- Urea can also be applied as foliar spray at the late-tillering and late jointing stages, if the crop shows nitrogen deficiency. Spray 3% urea solution (3 kg in 100 litres of water). To cover the crop thoroughly, spraying may be done cross-wise and a total volume of 300 litres of water per acre should be used.
- Wheat is more responsive to phosphorus application than *kharif* crops. Hence apply phosphorus to wheat and omit its application to following *kharif* crop.
- In case of non-availability of DAP and SSP in emergent situation, sulphated P fertilizer (13:33:0:15::N:P₂O₅:K₂O:S) or ammonium phosphate (12:40:0:10:1::N:P₂O₅:K₂O:S:Zn) may be applied as an alternative source of phosphorus to wheat, although it is costly.

Time and Method of Fertilizer Application:

Drill whole of P (55 kg DAP or 155 kg SSP) and K (20 kg MOP, if required as per soil test) at sowing. No urea is required at sowing if DAP is

used as source of phosphorus. If phosphorus is to be applied through SSP, apply 20 kg urea per acre at sowing. Broadcast 45 kg urea for timely sown crops and 35 kg per acre for wheat crop sown after mid December each with first and second irrigation. If second irrigation is delayed due to rains, the urea should be broadcasted at 55 days after sowing.

Fertilizers for wheat sown with different rice straw management practices:

Drill 65 kg of DAP per acre at sowing. Broadcast 45 kg urea per acre before first and second irrigation. To avoid the risk for delay in second irrigation (due to rains), application of 45 kg urea per acre at second irrigation should be replaced with two foliar sprays of 10% urea solution (20 kg urea in 200 litre water per acre) at 42 and 54 days after sowing.

In case of Super seeder, urea can be applied either before or after irrigation. Where wheat has been sown with Happy Seeder continuously for 3 years, reduce 20 kg urea per acre from fourth year onwards.

Need Based Fertilizer Nitrogen Application with 'PAU-Leaf Colour Chart' (PAU-LCC) or Green Seeker Optical Sensor

- In medium fertility soils, drill 55 kg DAP at sowing with conventional tillage and 65 kg DAP per acre for sowing with different rice residue management practices.
- At first irrigation, apply 40 kg urea per acre for timely sown and 25 kg urea per acre for late sown (after mid December) wheat. Before second irrigation proceed as under:

- Use integrated nutrient management approach through organic, bio and chemical fertilizers.
- Apply 90 kg urea and 55 kg DAP per acre in medium fertility soils.
- Apply potassium to deficient soils only.
- Use PAU-LCC or Green Seeker for need based urea application.
- Correct the manganese, zinc and sulphur deficiency in deficient soils.
- To mitigate the effect of high temperature at grain filling stage, spray potassium nitrate or salicylic acid as per recommendation.

i. PAU LCC Method

- Before second irrigation (about 50-55 days after sowing), match colour of the topmost fully exposed intact leaf of ten representative plants with PAU-LCC under shade of your body.
- At second irrigation, apply urea based on leaf greenness of 6 or more leaves out of 10 leaves as per following table:

Leaf Colour as per PAU-LCC	More than LCC shade 5.0	LCC shade 4.5 to 5.0	LCC shade 4.0 to 4.5	Less than LCC shade 4.0
Urea dose (kg/acre)	15	30	40	55

PAU-LCC is highly beneficial for achieving potential yield with optimum fertilizer nitrogen application in conventionally sown wheat as well as wheat sown with different rice straw management options.

ii. Green Seeker Optical Sensor Method

- The over fertilizer nitrogen reference plot of at least 30 sq metre area shall be established for the same variety with same date of sowing by applying 55 kg DAP + 45 kg urea per acre at sowing and 65 kg urea per acre at first irrigation.
- Before 2nd irrigation (about 50-55 days after sowing), record reading using Green Seeker optical sensor by keeping it at a distance of 75 cm above the crop canopy of the test field and over fertilized reference plot.
- Feed the age of crop, readings of green seeker for both the plots in the 'PAU-Urea Guide' app to know the amount of urea to be applied.

Note: PAU-LCC/Green Seeker based N application should be ensured at 50-55 days after sowing even if second irrigation is delayed due to rainfall.

For the use of LCC and Green seeker, the field should be free from diseases/insect attack and deficiency of other nutrients.

The PAU-LCC is available at PAU, Ludhiana Book Sale Counter at Gate No. 1, and its *Krishi Vigyan Kendras/Farm Service Advisory Centres* in different districts of Punjab.

Manganese Deficiency: Manganese deficiency generally appears in light soils under intensive cropping especially in rice-wheat rotation. The symptoms appear on the middle leaves as interveinal chlorosis with light greyish yellow to pinkish brown or buff coloured specks of variable size confined largely to 2/3 lower portion of the leaf. Later, the specks coalesce forming a streak or band in between the veins which remain green (See Plate No. 1, Page No. 165). In acute deficiency whole of the plant may die. At earing stage, the symptoms become prominent on flag leaf.

In manganese deficient soils, give one spray of 0.5% manganese sulphate solution (1.0 kg manganese sulphate in 200 litres of water), 2-4 days before first irrigation and three sprays afterwards at weekly intervals on sunny days. Do not grow durum varieties in sandy soils as these varieties are prone to manganese deficiency. **Manganese sulphate should be sprayed only as its soil application is not profitable.**