

**PACKAGE OF PRACTICES
FOR CROPS OF PUNJAB**

**RABI
2021-22**



**Punjab Agricultural University
Ludhiana**

and apply the recommended dose of urea immediately before 1st and second irrigations.

Drill 65 kg of DAP per acre at sowing with Happy Seeder or Super Seeder or PAU Smart Seeder. Refer PBW 569 for sowing. For more information, see Appendix VIII.

- vi. **Sowing of wheat in standing rice/basmati rice:** Medium to heavy textured soils which are high in pH and irrigated with higher residual sodium carbonate (RSC) water leads to poor infiltration rate. Under these conditions, harvesting of rice/basmati rice gets delayed and this further delays the sowing of succeeding wheat crop which decreases its productivity. In such conditions, sowing of wheat can be done in standing rice/basmati rice. For this purpose, broadcast 55–60 kg/acre of wheat seed in standing rice/basmati rice just before or immediately after the last irrigation during 10-25 October. Ensure sufficient moisture content in the field before sowing of wheat. Sow long duration wheat varieties recommended for timely sowing under conventional system. Ensure uniform distribution of seed in the field. Harvest the rice/basmati rice either manually or with combine fitted with PAU super SMS. If combine without SMS is used then distribute the lumps of loose straw for proper germination and establishment of the wheat crop. Apply full dose of recommended phosphorus and half nitrogen with first irrigation and remaining half of nitrogen at second irrigation. In case the rain occurs, apply 2nd split of nitrogen immediately after the rain. In any case, the 2nd split of nitrogen application must be completed within 50–55 days after sowing of wheat. Rest of the package is as per conventional sown wheat.

Fertilizer Application

Follow **integrated use of organic, bio and chemical fertilizers** for higher crop productivity and maintenance of soil health as under:

i) Organic Manures

- i. **Farmyard manure (FYM):** Apply good quality farmyard manure before sowing and reduce the fertilizer quantity by 2 kg of N and 1 kg of P per tonne of farmyard manure. Similarly, where wheat follows potato which received 10 tonnes of farmyard manure per acre, no phosphorus and only one-half of the recommended nitrogen dose i.e. 25 kg N (55 kg urea per acre) need to be applied.
- ii. **Poultry manure/gobar gas plant slurry/press mud:** If 2.5 tonne per acre of poultry manure or 2.4 tonne of gobar gas plant slurry after drying was applied to rice, reduce the fertilizer N dose in wheat by 25% and fertilizer P dose by 50%. Apply 37 kg N per acre i.e. 80 kg urea in two equal split doses (at first and second irrigation) and drill 75 kg single

- 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.

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 ‘Happy Seeder’ or ‘Super Seeder’ or ‘PAU Smart Seeder: Drill 65 kg of DAP per acre at sowing. Apply urea in two equal splits each of 40 kg per acre before first and second irrigation for Happy Seeder or PAU Smart Seeder sown wheat. Irrigation should be followed immediately after urea application. On heavy soils to avoid the risk for delay in second irrigation, broadcast 35 kg urea before sowing of wheat and the remaining urea before first irrigation. 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 Sens or

- Drill 55 kg DAP per acre at sowing in medium fertility soils.
- 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:

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

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. 161). 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.**

Zinc Deficiency: If recommended dose of zinc sulphate has been applied to the *kharif* crop, its application may be omitted to the following wheat crop. Zinc deficiency symptoms in wheat are stunted and bushy crop with [leaves chlorotic in the middle](#), which later break and keep hanging. Apply [25 kg of zinc sulphate \(21%\)](#) per acre which will be enough for 2-3 years. Zinc deficiency can also be corrected by foliar [spray of 0.5% zinc sulphate \(21% zinc\)](#). Prepare the solution for spray by dissolving 1kg zinc sulphate and 1/2 kg unslaked lime in 200 litres of water. This solution is sufficient for spraying an acre of wheat once. Two or three sprays at 15-day intervals are needed.

Enriching zinc content in wheat grain: The zinc content in wheat grain ([for nutritional quality improvement](#)) can be increased by giving one or two sprays of [0.5% zinc sulphate heptahydrate \(21%\)](#) solution [from anthesis to early grain development stages](#) in the evening hours.

Sulphur Deficiency: Wheat crop suffers from sulphur deficiency when sown in sandy soils. The deficiency is more severe when the winter rains continue for a long time in the early growth period. The symptoms first appear on the younger leaves with fading of the normal green colour. The [topmost leaves become light yellow except for the tip](#), while the lower leaves retain green colour for a longer time. This