

# Planning N, P and K for winter cereals

**Mark Plunkett**

Teagasc Crops Environment and Land Use Programme.

Cereal crops have come through the winter well, with good plant populations. These crops require an application of N, P and K over the coming weeks.

## First N split

Winter barley should receive its first N application (25% to 30% of the total N) in late February to mid-March when the crop is at late tillering. Winter wheat on the other hand should receive the first split of N at late tillering to GS 30 (mid-March), delivering 25% of its total N.

## Cereal P and K

Due to their higher yield, winter cereals need more P and K than spring crops. Research shows that as soil fertility increases, grain yield potential increases. A recent winter wheat trial conducted at Teagasc Oak Park showed that the crop achieved 1.5t/ha more grain on a P Index 3 soil, than on a P index 1 soil, all other things being equal.

Building and maintaining optimum soil fertility is key to achieving consistently high grain yields year after year. Maintaining optimum soil pH 6.5 is the first step to good soil fertility and, more importantly, for the efficient use of applied N-P-K.

## P and K requirements

Soil test results will accurately determine the soil P and K fertility on your farm. Table 1 shows the P and K index system and soil nutrient supply at each index.

Soils at index 1 have a very low P and K supply and will require higher rates of P and K (buildup and maintenance) – Table 2. Early application of P and K will be needed on low fertility (Index 1 and 2) soils to drive root and tiller development.

On index 3 soils P and K application aims to replace nutrients removed in grain and straw so rates should reflect grain yields. Table 2 shows the P and K requirements for a crop of winter wheat and barley yielding 10t/ha and suggested fertiliser types and rates.

Table 1: Soil P and K index system

Soil index	Soil P (mg/l)	Soil K (mg/l)	Soil Supply
1	0 – 3.0	0 - 50	Very Low
2	3.1 – 6.0	51 - 100	Low
3	6.1 to 10	101 - 150	Optimum
4	>10	>150	High

Table 2: P & K Advice for 10t/ha\* winter wheat or barley and suggest fertiliser programmes

Soil index	P kg/ha (units/ac)	K kg/ha (units/ac)	Bags/ac
1	58 (46)	130 (104)	4.5 bags 10-10-20
2	48 (38)	115 (92)	4.5 bags 12-8-20
3	38 (30)	100 (80)	4.25 bags 10-7-20
4	0	0	---

\*Adjust P by 3.8kg/t, K by 10kg/t for lower or higher grain yields

Table 3: N-P-K advice for 9t/ha winter oats and suggest fertiliser programmes

Soil index	P kg/ha (units/ac)	K kg/ha (units/ac)	Bags/ac
1	54 (43)	160 (130)	4.0 bags 10-10-20 + 1 bag 50% K
2	44 (35)	145 (116)	3.5 bags 10-10-20 + 1 bag 50% K
3	34 (27)	130 (104)	2.5 bags 10-10-20 + 1 bag 50% K
4	0	0	---

\*Adjust P by 3.8kg/t, K by 15kg/t for lower or higher grain yields

Table 3 shows P and K advice for a 9t/ha crop of winter oats. Oats have a large demand for K due to high K levels removed at harvest time in oaten straw. Additional K can be supplied as muriate of potash (50%K) which can be applied at any time of the year to replenish and maintain soil K levels.

Where organic manures have been applied the figures in Table 2 and 3 will need to be adjusted. For example, 1,000 gallons of cattle or pig slurry is equal to a 50kg bag of 6-5-32 or 19-7-20, respectively.

## Fertiliser planning

To prepare a fertiliser plan, you need up-to-date soil test results, cropping plan, field areas and previous crop yields (for at least the last three years). Teagasc has developed a new online fertiliser planning tool (NMP online), which will produce a farm fertiliser plan on a crop-by-crop basis

and soil fertility maps for your farm. Contact your local advisor/consultant to prepare a fertiliser plan for 2019.

For further information on N, P and K rates for cereals log on to <https://www.teagasc.ie/crops/soil-soil-fertility/crop-n-p-k-advice/winter-cereals/>



## Key messages

- Update your farm fertiliser plan for 2019.
- Adjust P and K rates based on soil tests and previous crop yields.
- Select suitable compound fertilisers to deliver the correct P and K requirements in a single application.
- Prepare a farm fertiliser shopping list now.
- Apply P and K to winter cereals over the coming weeks.