

TRADITIONAL FERTILIZATION STRATEGIES FOR NITROGEN MANAGEMENT

Problem

One of the biggest challenges in recent years has been the rising cost of energy resources, which has also pushed up the price of mineral fertilizer to unprecedented heights. Farmers must strictly follow recommendations for crop fertilization to save their own expenses

Solution

Farmers are encouraged to pay attention to recommendations on crop fertilization to be on track for profitable farming

Outcome

The basic knowledge is provided on crop nutrition (mineral N, P, K fertilizers) of different crops and the stage of their development

Practical

All plants need the basic macronutrients - nitrogen (N), phosphorus (P) and potassium (K), but their requirements vary from plant to plant. When drawing up a fertilization plan, it is common to calculate how many kilograms of an active element will be needed to produce 1 ton of a product. The nutrient richness of the soil, the type of pre crop, and the use of organic fertilizers must be considered. Different crops have different macronutrient requirements, and the most recommended coefficients used to calculate the NPK requirement per ton of production are given in Table.

It is estimated that about 30 % of the nitrogen in crops comes from the soil and 70 % from mineral fertilizers. Winter crops are fertilized as they emerge, often with two or three applications, depending on the farming strategy chosen and the condition of the crop. Nitrogen application in spring for winter wheat increases the number of shoots formed during the tillering stage, the number of productive stems during the budding stage and the quality of the grain during the grain formation stage. Winter wheat is said to consume about 40% of the total nitrogen applied by the nod formation stage. Winter oil-seed rape should be fertilized 2 to 3 times in the spring, but it is important to remember that oil-seed rape is demanding of sulfur, so nitrogen fertilizers should also contain sufficient sulfur. It is also important to use liquid fertilizers containing boron.

Oats and barley are better able to take up nutrients from the soil than spring wheat,

Applicability box

Geographical coverage

Europe

Application period

N/A

Required time

N/A

Period of impact

Continuous

Equipment

Not Specific

so their need for mineral fertilizers is somewhat lower than that for spring wheat. The calculated amount of fertilizer can be applied to the crop in one or two applications according to the estimated potential yield. Spring wheat can be fed two to three times: NPK at sowing (nitrogen at least 50 % of the planned rate) and at a later stage of growth (tillering).

Table 1. Recommended coefficients for planning the fertilization of prevailing crops.

Crop	Recommended nutrient requirement (kg/ha) for 1 t of production (including by-products such as straw)		
	(N)	(P ₂ O ₅)	(K ₂ O)
Oats	22-25	10-12	21-25
Spring barley	21-25	10-11	17-20
Spring wheat	21-25	7-11	17-20
Spring triticale	19-22	10-11	22-24
Winter wheat	22-25	10-12	17-20
Winter oil-seed rape	40-45	20-25	40-55
Winter rye	21	10-11	24-25
Peas	4.5	10-14	20-30
Beans	5.0	15-17	22-30

Legume crops (peas and beans) need nitrogen only at the initial stages of growth. It is recommended that peas should be fertilized with nitrogen fertilizer at the rate of 30-45 kg/ha before sowing and with phosphorus and potassium according to the coefficients given in the table and the yields expected to be achieved.

Molybdenum (Mo) is required for the formation of nodule bacterium on leguminous plant roots. It is mostly deficient in acidic soils and soils with a light granulometric composition. Nowadays crop nutrition needs to be well fulfilled. Farmers should follow this rule, that the maximum farm profitability is better than the maximum yielding.

Further information

About this Factsheet

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Publisher: "Mano ūkis"

Date: May 2023

NUTRI-CHECK NET is a Horizon Europe multi-actor project establishing a self-sustaining, multi-actor, Thematic Network called "NUTRI-CHECK NET" that builds farm-level adoption of best field-specific nutrient management practices across Europe. In nine countries, farmers' Crop Nutrition Clubs will identify and share the nature of their uncertainties about crop nutrition, their challenges and barriers to change. Decision systems and nutrition tools (including commercial products, services, and recent research outputs) will be assembled by national experts across Europe, including leading farmers, into a common online NUTRI-CHECK NET platform.

Check the project website: <https://nutri-checknet.eu>