UREA stabil

...progress in sky blue

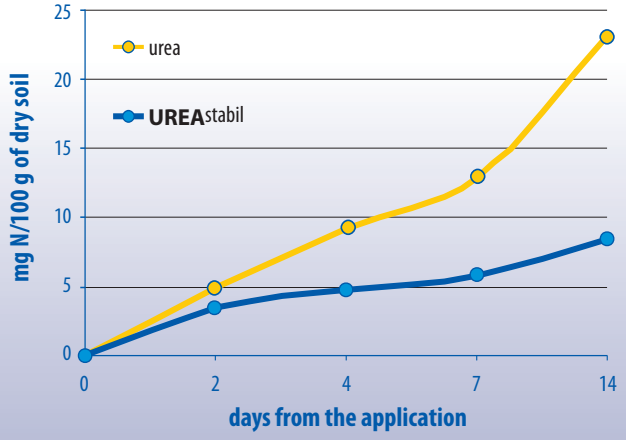
UREA stabil is a concentrated nitrogen fertilizer intended for field crops. It is based on urea (46 %) with an added urease inhibitor N-(n-butyl)-thiophosphoric triamid (NBPT).

Advantages of UREA stabil fertilizer

- saturation of the root zone by NH_4^+ – creation of nitrogen supply and elimination of subsequent drought impacts
- a wider application period whilst maintaining the mobility of nitrogen
- minimal toxicity to germinating plants during precision placement of the fertilizer
- nitrogen utilization even at low soil temperatures

The basic advantage of UREA stabil fertilizer is a combination of rapidly soluble, well absorbable nitrogen with a urease inhibitor. This ensures a reduction of nitrogen loss in the form of ammonia volatization into the atmosphere during surface applications. Above all, however, it restrains the sorption and fixation of NH_4^+ in the surface soil layer, which slows the effect of this nitrogen form down. The combination of amidic nitrogen and the urease inhibitor in the product enables early applications and higher doses, when the most suitable conditions for the transport of a non-polar molecule directly to plant roots supervene. At low temperatures of soil the NH_4^+ form is the best accepted form of nitrogen. A positive effect of the intake of macronutrients and micronutrients from the soil has been recorded when fertilizing with the amidic nitrogen. A big advantage of UREA stabil fertilizer is also the possibility of applying it to seeds without any adverse effects on germination and root growth. This makes UREA stabil a fertilizer with a broad application in agriculture.

Nitrogen losses due to ammonia volatization when applying fertilizers on the soil surface (temperature at 10°C)



The importance of urease inhibitor NBPT

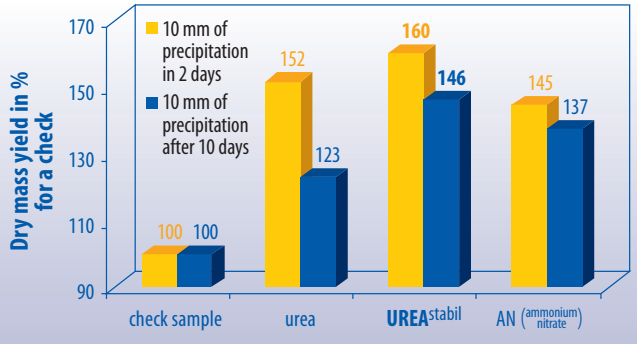
- improvement of nitrogen penetration to plant roots by restraining the sorption and fixation of NH_4^+
- reduction of losses due to ammonia volatization into the atmosphere during surface applications

Advantages of UREA stabil fertilizer in comparison with AN (ammonium nitrate)

- a higher content of nitrogen (46 %)
- a very good solubility and transport to plant roots even at lower precipitation
- utilization of nitrogen by plants even at lower soil temperatures (important during regenerative fertilization)
- nitrogen uptake by roots in 3 different forms (amidic, ammonium and after nitrification also in a nitrate form)
- no adverse effects on plant germination when applied together with seeds during sowing procedure
- a longer-term effect – a possibility of increased doses and therefore reducing the number of applications

The influence of UREA stabil fertilizer on dry mass yield of spring wheat plants (Ruzyně Experimental Institute 2004 - 2005)

The following graph shows how spring wheat plants react in containers when using different types of fertilizers, which were applied to the soil surface at the stage of 3rd leaf (end of tillering). The listed results characterize the level of dry mass creation until the stage of stem elongation. During a long-term absence of precipitation UREA stabil had a more important influence on the dry mass creation in comparison with an untreated urea.



Possible applications

- application to seeds and during the precision placement of fertilizer
- autumn application to winter rape
- regenerative fertilization of winter crops (rape, cereals)
- production additional fertilization of cereals and rape
- basic fertilization and additional fertilization of spring crops
- last seasonal fertilization of wheat

The fertilizer is suitable for the fertilization of spring as well as winter crops and is used for surface broadcast application and for subsurface band application (e.g. precision placement of fertilizer) as well.

The regenerative fertilization of winter cereals and rape has proved itself competent particularly at a slow onset of spring with lower temperatures. The best results are obtained when the application of UREA^{stabil} fertilizer is followed by cool and humid weather with precipitation of min. 5 mm within 14 days after the application.

When fertilizing irregular vegetation at air temperatures above 20 °C, wind and a long-lasting drought it is necessary to pay close attention to a higher risk of ammonia volatization. This applies for example to last seasonal fertilization of wheat, surface application of corn etc.

Dosage

When determining the dosage of UREA^{stabil} we decide upon:

- the overall needs of nitrogen considering the planned yield
- N_{min} reserves in the soil
- characteristics of the weather during vegetation
- number of planned nitrogen doses
- crop growth structure

Winter wheat

Regenerative fertilization

40-60 kg N/ha - light soils in humid regions
60-80 kg N/ha - light soils in dry regions
80-120 kg N/ha - medium and heavy soils

With heavily damaged crop growth (due to cold, herbicides etc.) do not exceed the recommended dose of 60 kg N/ha.

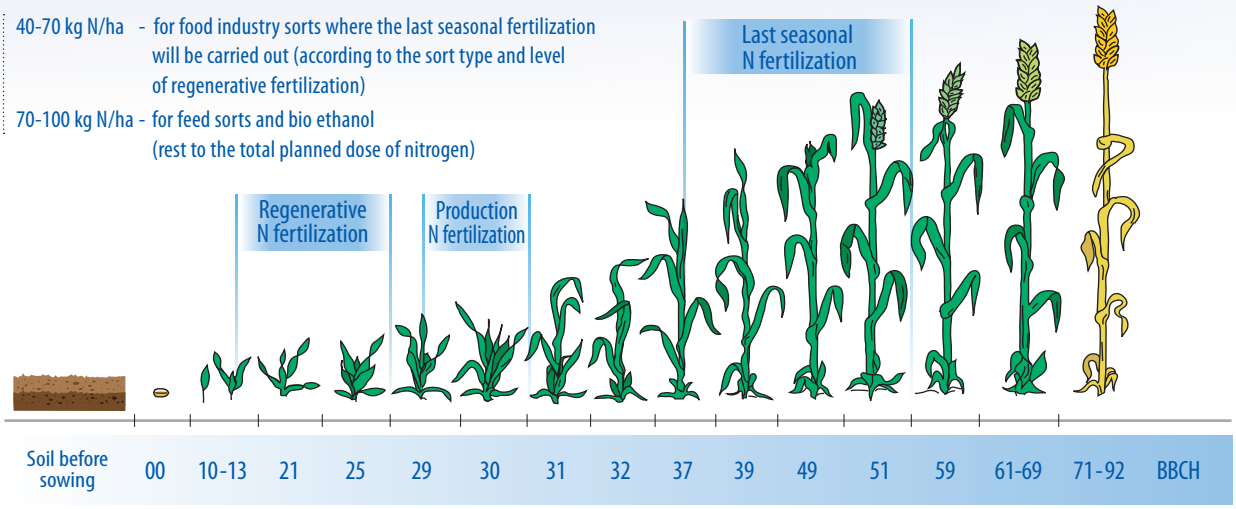
Last seasonal fertilization

30-50 kg N/ha - only for food industry sorts (dose according to the sort and crop growth structure)

In areas that typically have drought spells apply at the end of stem elongation (BBCH 37-39), when there is an assumption of a higher rainfall. In more humid areas with a higher certainty of rainfall apply at the beginning of heading (BBCH 51-55).

Production fertilization

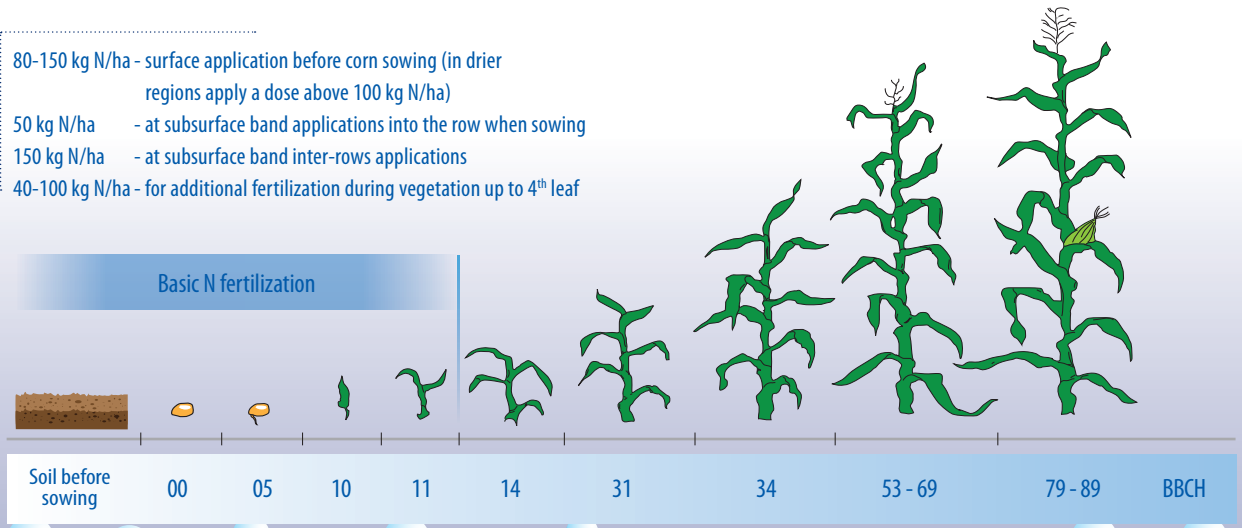
40-70 kg N/ha - for food industry sorts where the last seasonal fertilization will be carried out (according to the sort type and level of regenerative fertilization)
70-100 kg N/ha - for feed sorts and bio ethanol (rest to the total planned dose of nitrogen)



Corn

Basic fertilization

80-150 kg N/ha - surface application before corn sowing (in drier regions apply a dose above 100 kg N/ha)
50 kg N/ha - at subsurface band applications into the row when sowing
150 kg N/ha - at subsurface band inter-rows applications
40-100 kg N/ha - for additional fertilization during vegetation up to 4th leaf



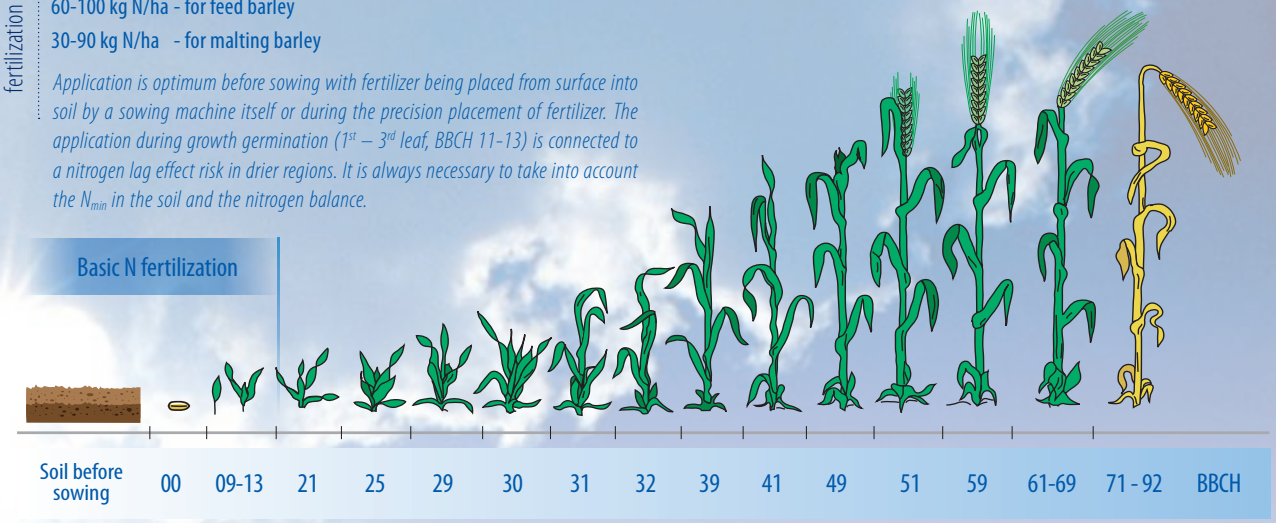
Spring barley

Basic fertilization

60-100 kg N/ha - for feed barley

30-90 kg N/ha - for malting barley

Application is optimum before sowing with fertilizer being placed from surface into soil by a sowing machine itself or during the precision placement of fertilizer. The application during growth germination (1st – 3rd leaf, BBCH 11-13) is connected to a nitrogen lag effect risk in drier regions. It is always necessary to take into account the N_{min} in the soil and the nitrogen balance.



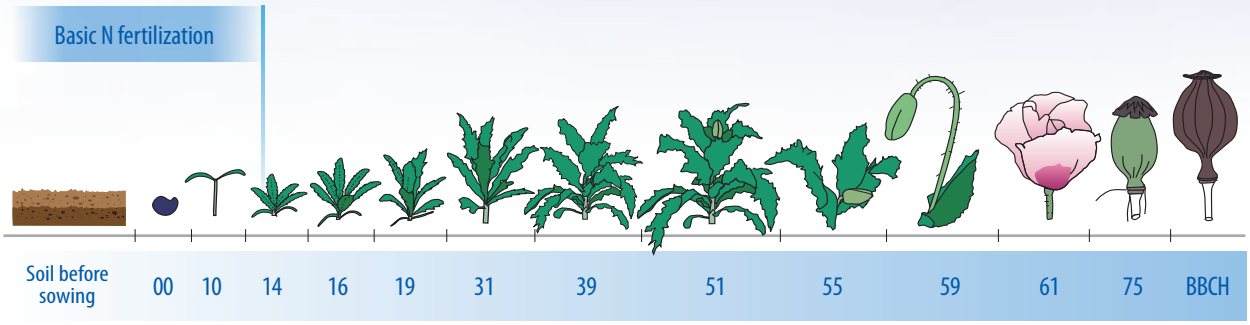
Poppy seed

Basic fertilization

70-130 kg N/ha - basic fertilization (higher doses when one nitrogen application only)

30-50 kg N/ha - for additional fertilization during stem elongation (BBCH 30-39)

Application is optimum before sowing with fertilizer being placed from surface into soil by a sowing machine itself or during the precision placement of fertilizer. The application during growth germination (1st – 3rd leaf, BBCH 11-13) is connected to a nitrogen lag effect risk in drier regions.



Winter rape

Autumn fertilization

30 – 60 kg N/ha

Specified in the text below.

Regenerative fertilization

First dose of nitrogen

60-70 kg N/ha - light soils in humid regions

80-100 kg N/ha - light soils in dry regions

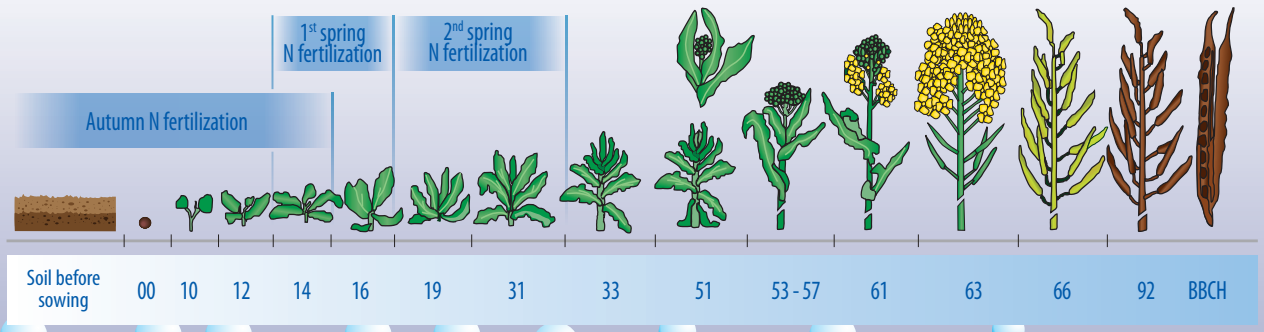
80-120 kg N/ha - medium and heavy soils

At a very weak and substantially damaged crop growth from cold the use of UREA^{stabil} fertilizer is inappropriate, but it is possible to recommend it for 2nd dose of nitrogen.

Second dose of nitrogen

(depending on the quantity of 1st dose approximately 14 days after 1st dose of nitrogen, at the beginning of stem elongation at the latest)

60-120 kg N/ha - (adapt this dose according to the level of 1st dose and the total balance of nitrogen)



Winter rape – autumn nitrogen fertilization

Technology Basis

- movement of a part of applied nitrogen from the spring season to autumn vegetation
- the total dose of nitrogen does not increase, only the distribution is changed

Aim of Fertilization

- for plants to have a strong entry into winter
- a safe start of spring vegetation even under adverse conditions for regenerative fertilization
- straw decomposition assurance
- promoting the creation of branch bases and flowers already in the autumn

Effect Principle

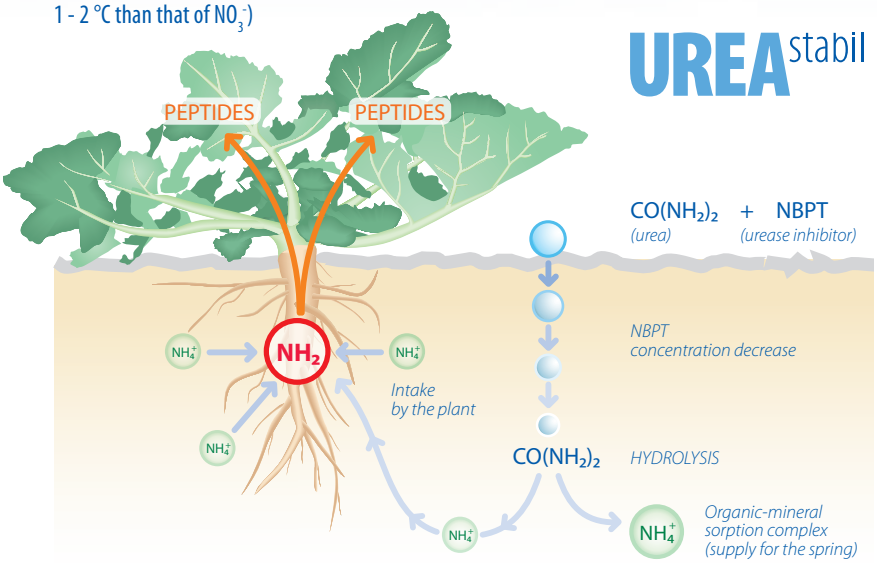
- assures the supply of acceptable ammonium nitrogen in the root zone is already in place by the autumn
- faster and more intensive transfer of assimilates from leaves to the root => increase in the intensity of root growth and branching
- the supply of NO_3^- in leaves is not increased (nitrogen is already incorporated into amino acids in the root) => a lower risk of frost damage
- nitrogen in plant´s biomass is the primary source for the plant in the spring
- ammonium nitrogen in the root zone is the fastest absorbable form for the restoration of root activity (NH_4^+ intake is 2 - 3 times more intensive from 1 - 2 °C than that of NO_3^-)

Other Advantages of Technology

- decrease in the necessity of a very early regenerative dose of nitrogen – enlargement of the application period (for example during waterlogging)
- maximum usage of early spring moisture
- only 2 spring doses of nitrogen

Terms and Doses

- crucial factors for decision making:
  - soil tillage technology – depth and method
  - distribution and decomposition of straw in soil
  - plant strength and colouring, depth of root branching
  - balance and requirements for the release of nitrogen in the autumn and spring
- dose of 30 – 60 kg N/ha
- application from the middle of September to the beginning of fertilization ban
- it is necessary to carry all the applications out according to legislation in force



UREAstabil

After the dissolution of a UREA^{stabil} granule, the concentration of the inhibitor (NBPT) decreases during its penetration into the root zone and because of the urease activity, the hydrolysis of urea takes place: $CO(NH_2)_2$ to NH_4^+. A part of NH_4^+ ions is already absorbed by the plant by the autumn and it is converted into amino acids in the roots. They are transported to the leaves without causing an excessive intake of water and so decreasing the frost resistance. The remaining part of the NH_4^+ ions binds to the sorption complex creating a supply of nitrogen for the spring.

Packaging:

BIG - BAG 500 and 1,000 kg

Storage

UREA^{stabil} is best stored in containers which prevent long-term exposure to moist air. Free storage is only possible temporarily before application and should not exceed 1 week. When stored it is appropriate to cover the fertilizer with a sheet to limit the exposure to moist air. Air temperature in long-term storage should not exceed 35 °C.

AGRA GROUP a.s., Tovární 9, 387 15 Střelské Hoštice, Czech Republic
phone: +420 383 399 737, fax: +420 383 399 735, GSM: +420 606 634 784, e-mail: info@agra.cz, www.agra.cz