

EXPERTS FOR GROWTH



Floranid® Twin

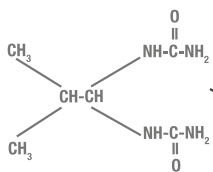
With double N technology
Efficient and sustainable nutrient supply

Twin Technology

Floranid® TWIN

The slow-release fertilizers in the Floranid® Twin range are comprised of a unique combination of two highly efficient and well-proven nitrogen compounds, ISODUR® and CROTODUR®. This double N technology ensures a long-lasting and reliable

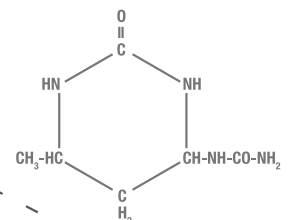
supply of nitrogen at the highest possible utilisation rate and guarantees optimal plant growth for the successful implementation of ambitious planting and care plans.



ISODUR®

is released through hydrolysis

Mainly moisture-dependent



CROTODUR®

is released by microorganisms

Mainly temperature-dependent



Mode of action of Floranid® TWIN

One measure of the efficiency of a slow-release nitrogen compound is known as the activity index (AI). In comparison with other slow-release fertilizers, ISODUR® and CROTODUR® are characterised by an exceptionally high activity index of >98% thanks to their molecular structure. This results in a highly effective level of plant availability and nutrient utilisation whilst offering outstanding slow-release action. In Floranid® Twin fertilizers, the two nitrogen compounds ISODUR® and CROTODUR® are formulated in an ideal balance according to their particular strengths. This way, they complement each other to provide a unique range of characteristics.

The ISODUR® molecule is primarily broken down via the process of hydrolysis and is even able to start gradually releasing nitrogen at relatively low temperatures. The slow-release action of the stable cyclic molecule CROTODUR®, on the other hand, relies also on microbial processes and is therefore more closely affected by temperature, a factor which influences the activity of microorganisms. As a result, the combination of ISODUR® and CROTODUR® ensures a reliable, continuous and long-lasting availability of nitrogen, at different weather and temperature conditions – from the first application in spring to an extra feed in late autumn.



Synergy effect of Floranid® Twin

ISODUR® makes nitrogen available more quickly than CROTODUR® and even on first application provides initial stimulation for sustained growth and a corresponding greening effect. In this process, metabolites – organic products that convert and break down compounds – are also formed, which have a positive effect on soil activity at microbiological level. Thanks to its chemical properties, the nitrogen effect of CROTODUR® is then put into action with a time delay and with additional support from the initial stimulation of the microorganisms in the soil.

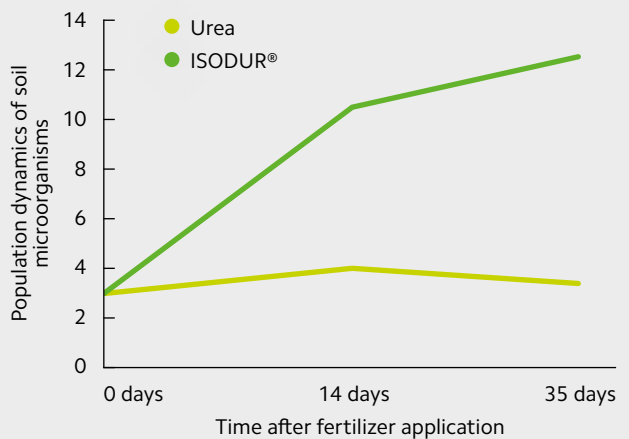
Due to the synergy effect of this double N technology, a reliable and consistent supply of nutrients to the grass is maintained at an optimal level over a very long period. Consequently, the plants can utilise the nutrients more effectively for shoot and root growth as well as for important metabolic processes.

Floranid® Twin fertilizer have a positive impact on plant physiological parameters such as the build-up of matter, photosynthesis activity, and the storage of reserves. These factors were clearly strengthened through the use of double N technology in contrast with the use of ISODUR® on its own. Stimulating and stabilising these processes in a plant ultimately leads to wear an increase in resistance to various stress factors, including heat, drought, frost, and disease, as well as leading to an improvement in the plant’s ability to regenerate.

The effect of Floranid® Twin on soil life

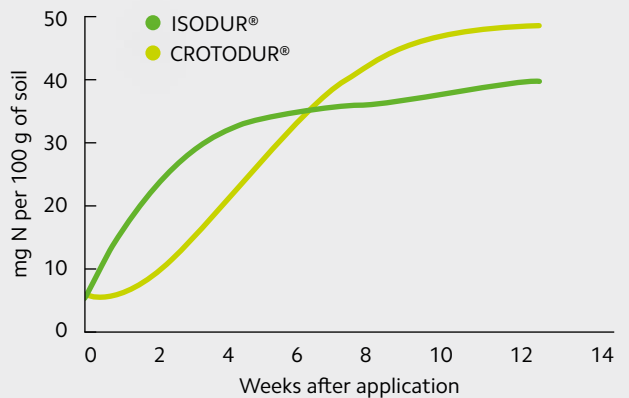
Floranid® Twin has been proven to stimulate microorganisms in the soil, thus supporting important interactions in the rhizosphere. An active soil life promotes vital growth and reduces a plant’s susceptibility to diseases.

Influence of ISODUR® on microorganisms in the soil



Labor Rittmo, France, 2013

Release of nitrogen from ISODUR® and CROTODUR®



Source: Jung und Dressel, 1971



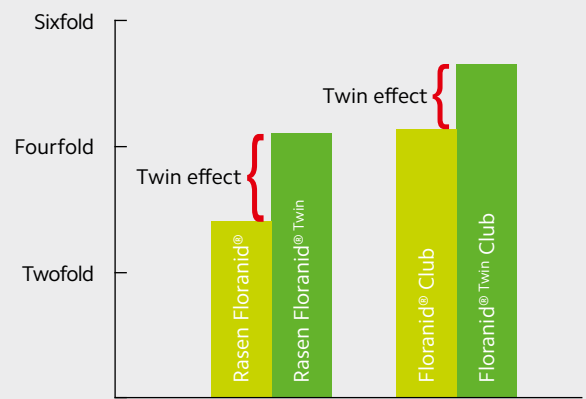
The effect of Floranid® Twin on roots

Extensive laboratory studies and field tests have shown that ISODUR® and CROTODUR® promote root growth. Stable root architecture is crucial for the optimal functionality of sport turf.

Strengthening effect of Floranid® Twin

For vigorous regenerative growth after exposure to stress or to support recovery from certain challenging conditions, for example heat and frost, a plant must be able to rely on stored reserves. Floranid® Twin fertilizer promote these physiological processes and ensures the growth of strong and resilient plants.

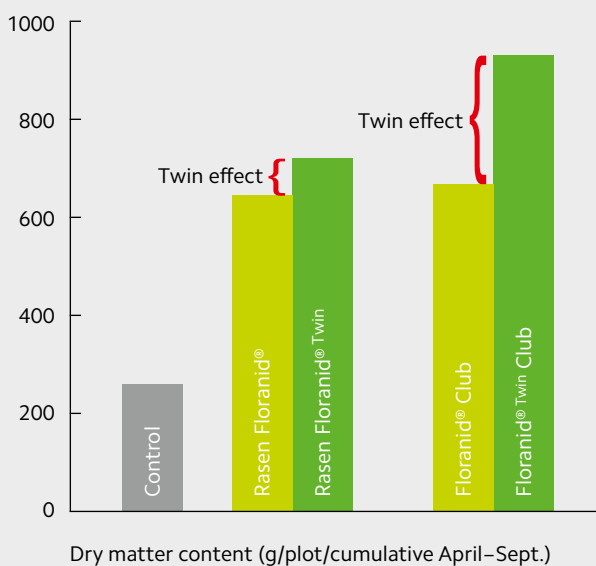
Influence of Floranid® Twin on the storage of reserves in roots



Parameter: Organic carbon (g)
Increase relative to unfertilised control specimen

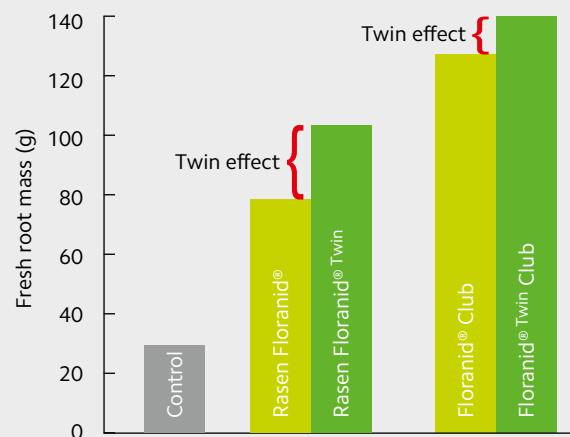
GIE Fleurs et plantes du Sud Ouest, Bordeaux, France, 2014

Influence of Floranid® Twin on fertilizer efficiency



STEPP Research Institute Brittany, France, 2014

Influence of Floranid® Twin on root growth



GIE Fleurs et plantes du Sud Ouest, Bordeaux, France, 2015

Qualitative properties of Floranid® TWIN

The effectiveness and efficiency of a fertilizer are primarily determined by its physical and chemical properties. In the new, state-of-the-art, slow-release fertilizer facility in the COMPO EXPERT plant in Krefeld, Germany, Floranid® Twin fertilizers are produced according to strictly defined quality requirements. By comparison with the first-generation Floranid® fertilizers that came before, in commissioning the new production facility, some quality criteria have even been stepped up for Floranid® Twin fertilizers.



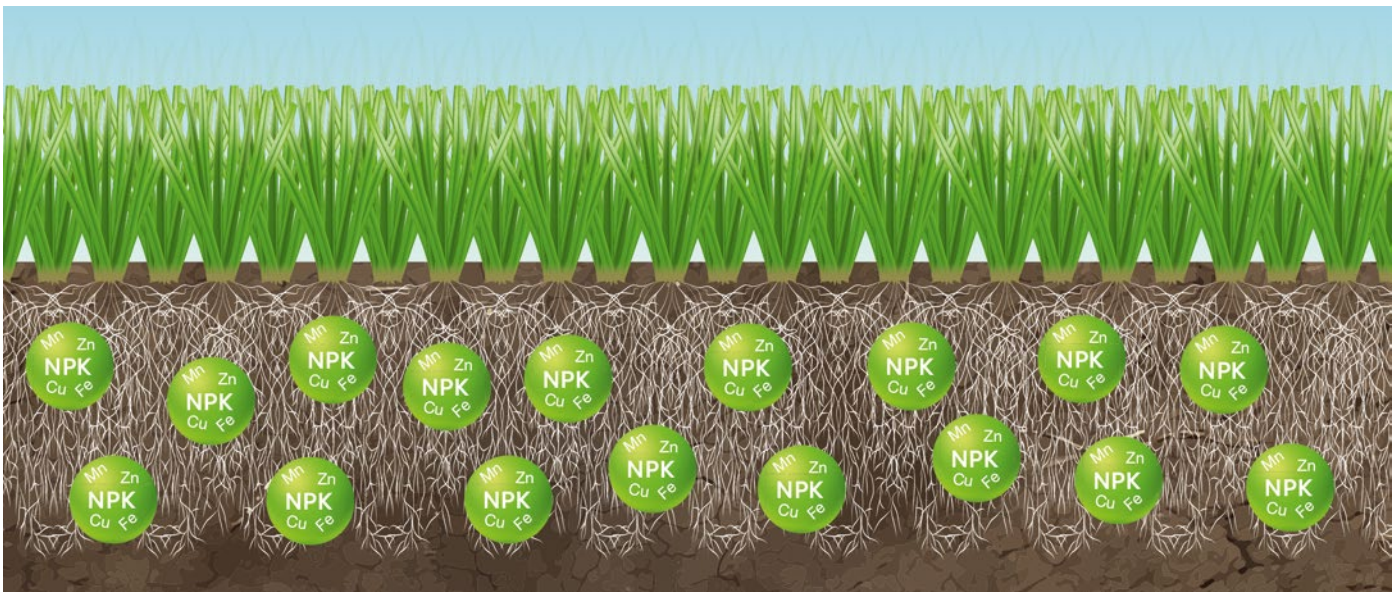
Granulometry

Floranid® Twin fertilizers consist of what are known as complex granular compounds, which are produced from a homogeneous premix containing all requisite nutrients. This means that the whole spectrum of nutrients can be found in each individual granule at the same concentration. That guarantees a homogeneous distribution of the granules and hence a perfect nutrient supply. The optimised solubility of the granules facilitates this process and enables rapid penetration of the fertilizer into the sward and the root zone (Fig. below).

Granule size

Floranid® Twin fertilizers for use on sports fields, public green spaces, and in horticulture and landscape design are supplied at the approved granule-size spectrum of 0.7–2.8 mm; extra-fine granulated products for use on golf courses in the granule-size spectrum of 0.5–1.4 mm. A new feature is that the distribution within the fractions is homogeneous and, overall, a greater proportion also fall within the smaller granule-size. This results in excellent spread behaviour, and perfect distribution of the granules on the turf – a prerequisite for the efficient supply of nutrients.

Complex granules



Each granule contains all the nutrients at the same concentration. This ensures even distribution of the nutrients.

Improved phosphate and magnesium absorption

Floranid® Twin fertilizers are also characterised by an elevated proportion of water soluble phosphate and magnesium. The proportion of water soluble phosphate amounts to 80% of the total phosphate; the proportion of water soluble magnesium makes up 80% of the total magnesium as well.

Increased levels of trace elements

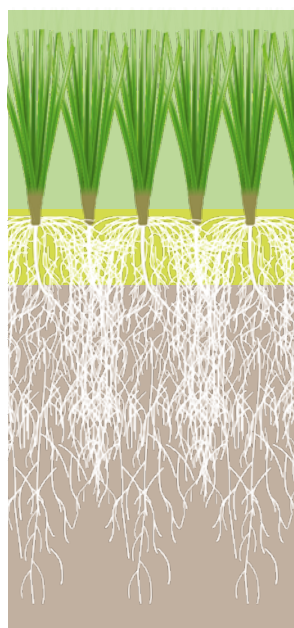
Trace elements perform essential functions in a plant's metabolic processes and promote disease resistance. In the development of the Floranid® Twin fertilizers, great attention was paid to the adequate provision of micronutrients and the levels of Mn, Cu, and Zn were significantly increased.

Advantages of Floranid® Twin slow-release fertilizers at a glance

- Maximum nutrient efficiency (Acitivity Index 98%)
- Reliable slow-release action
- Excellent spreading properties
- Homogeneous distribution of nutrients
- Improved phosphate and magnesium absorption
- Comprehensive range of trace elements
- Even, steady growth
- Optimum performance, even at low temperatures
- Root support
- Stimulates microbial soil activity
- Highly resistant to leaching
- Low salt index
- Supports disease and stress tolerance



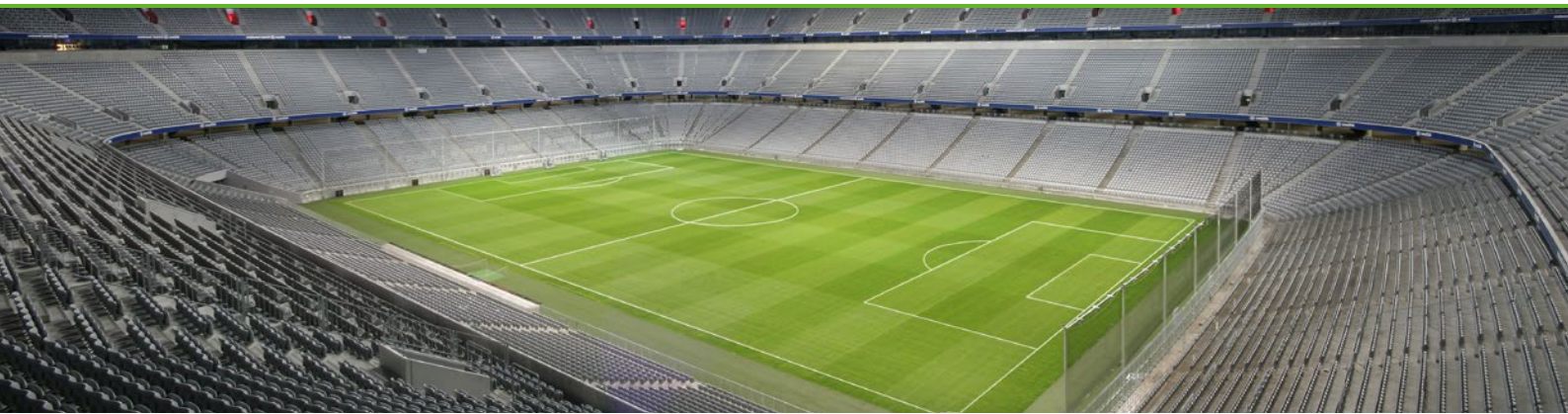
Floranid® Twin fertilizers act at every level



Even growth
Tough lawn surface
Homogeneous colour
Increased disease and stress tolerance

Reduced thatch

Vigorous root growth
Increased biological activity in the soil



Versatile Floranid® Twin product range

Depending on requirements and objectives, Floranid® Twin products are available in various nutrient formulations and granulation types: high-nitrogen formulas for springtime and regeneration feeds, high-potassium formulas for applications in summer and autumn, and balanced nutrient formulations for turf maintenance feeds.

Thanks to double N technology and the resulting synergy effect, plants are optimally supplied throughout the growing season with slow-release nitrogen for growth and development processes, which is especially important for intensive-used areas. A fertilizer concept based on Floranid® Twin products ensures a sustainable and efficient supply of nutrients for best functionality.

The updated range now features additional improvements, alongside double N technology:

Higher proportion of water soluble phosphate. The water soluble portion can be taken up immediately by the plants and thus contributes to a reliable supply of P.

Higher proportion of water soluble magnesium. A large proportion of a plant's magnesium supply for the formation of

chlorophyll, amongst other functions, is provided via mass flow as the plant absorbs water. This means that water soluble magnesium is important for a reliable, predictable supply of Mg.

Higher micronutrient content. Micronutrients are vital for healthy growth. Although the required quantities are low, the right levels are important. All Floranid® Twin products contain the key micronutrients in increased proportions and a complete supply.

The Floranid® Twin product range is divided into fine granular quality (Sports Grade) for normal spreading applications and microgranules (Greens Grade) for particularly fine distribution of the fertilizer granules on low-cut turf, such as putting greens. These products bear the additional name "Eagle".

Microgranules for Eagle products (Greens Grade)



An overview of the Floranid® Twin range

Floranid® Twin fine granules (Sports Grade)

- Wide range of formulas adjusted to suit different areas of application.
- Double N Technology with high levels of ISODUR® and CROTODUR® for reliable slow-release action.
- Homogeneous granule size for easy application and a uniform spread pattern.
- Granule for granule, identical nutrient formulation, no demixing is possible.
- Contains macro- and micronutrients for optimal assimilation.
- Micronutrient contents in the Floranid® Twin range have been adjusted and increased.

Fine granules (Sports Grade)



Product name	Formula	Special characteristics	Main use
Floranid® Twin Turf	20-5-8(+2+22.5) with micronutrients	Lawn fertilizer with an ideal composition.	High-quality turfed areas, such as stadium grounds, golf courses, show areas, high-quality ornamental lawns
Floranid® Twin Permanent	16-7-15(+2+21.25) with micronutrients	Universal complete fertilizer with proven formula suitable for all applications	All planting in public green spaces, sports fields and golf courses, plant nurseries, commercial horticulture
Floranid® Twin NK	14-19(+3+33.75) with micronutrients	Phosphate-free NK fertilizer with plenty of potash and magnesium. For sites already rich in P	All planting in public green spaces, sports fields and golf courses, plant nurseries, commercial horticulture
Floranid® Twin Club	10-5-20(+4+28.75) with micronutrients	Powerful, high-potash, slow-release complete fertilizer. Especially suitable as an autumn fertilizer	All planting in public green spaces, sports fields and golf courses, plant nurseries, commercial horticulture
Floranid® Twin Baumkraft	9-5-20(+4+9) with micronutrients	High-potassium complete tree fertilizer for tree care and regeneration feeds. With <i>Bacillus subtilis</i> , selection E4-CDX®. Promotes vital root growth and improves hardiness of trees	Urban trees, tree plantations, high-value show trees



Floranid® Twin microgranules (Greens Grade) for the Eagle range

The nutrient formulas are designed to be taken up by highly stressed grassed areas

- Double N Technology with high levels of ISODUR® and CROTODUR® for reliable slow-release action.
- Fine and uniform granule size for low-cut turf (Greens Grade)
- Granule for granule, identical nutrient formulation, no demixing is possible.
- Contains macro- and micronutrients for optimal assimilation.

Product name	Formula	Special characteristics	Main use
Floranid® Twin Eagle Master	19-5-10(+2+22.5) with micronutrients	Lawn fertilizer with an ideal composition	Low-cut turf, e.g. putting greens, pre-greens, and tees; high-quality turfed areas
Floranid® Twin Eagle NK	17-0-16(+2+30) with micronutrients	Phosphate-free NK fertilizer with plenty of potash and magnesium. For sites already rich in P	Low-cut turf, e.g. putting greens, pre-greens, and tees; high-quality turfed areas
Floranid® Twin Eagle K	12-0-24(+3+30) with micronutrients	Powerful, high-potash complete fertilizer. Provides resistance to cold conditions. Ideal as an autumn fertilizer	Low-cut turf, e.g. putting greens, pre-greens, and tees; high-quality turfed areas

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