

EXPERTS FOR GROWTH



# Floranid<sup>®</sup> Twin

With Double N Technology  
Efficient and sustainable  
nutrient supply

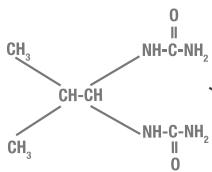


# Twin Technology

## New Floranid® Twin

The new slow-release fertilisers 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

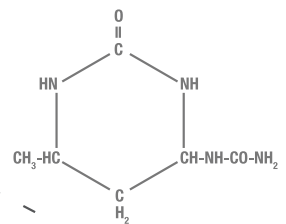
supply of nitrogen at the highest possible utilisation rate and guarantees optimal plant growth for the successful implementation of ambitious planting and care plans.



### ISODUR®

is released through hydrolysis

Mainly moisture-dependent



### CROTODUR®

is released by microorganisms

Mainly temperature-dependent



## Mode of action of Floranid® Twin

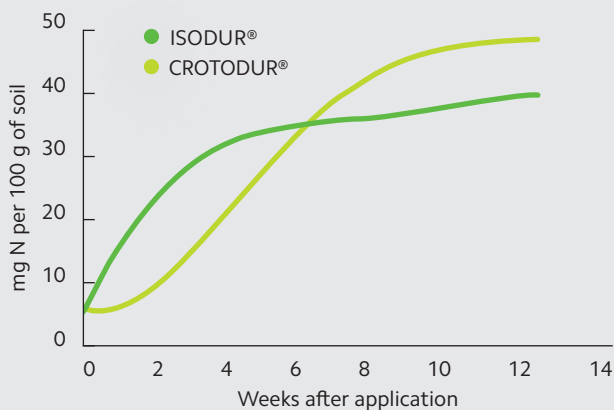
One measure of the efficiency of a slow-release nitrogen compound is known as the activity index (AI). In comparison with other slow-release fertilisers, ISODUR® and CROTODUR® are characterised by an exceptionally high activity index of >98% thanks to their molecular structure. This results in a highly effective level of plant availability and nutrient utilisation whilst offering outstanding slow-release action. In Floranid® Twin fertilisers, 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.

Fig. 1: Release of nitrogen from ISODUR® and CROTODUR®



Source: Jung und Dressel, 1971

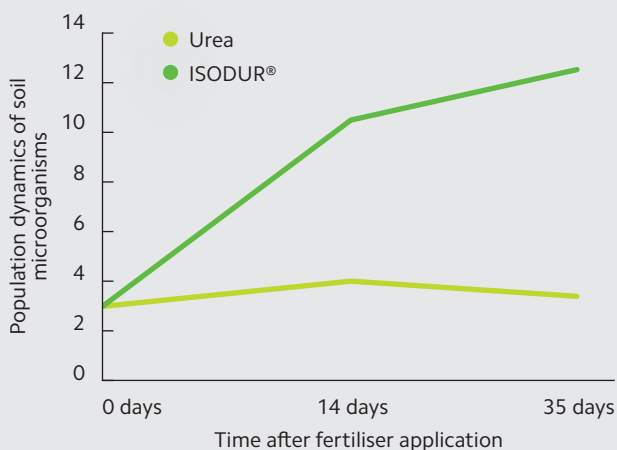
Due to the synergy effect of this Double N Technology, a reliable and consistent supply of nutrients to the grass is maintained at an optimal level over a very long period. Consequently, the plants can utilise the nutrients more effectively for shoot and root growth as well as for important metabolic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

Floranid® Twin fertiliser 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.

Fig. 2: Influence of ISODUR® on microorganisms in the soil



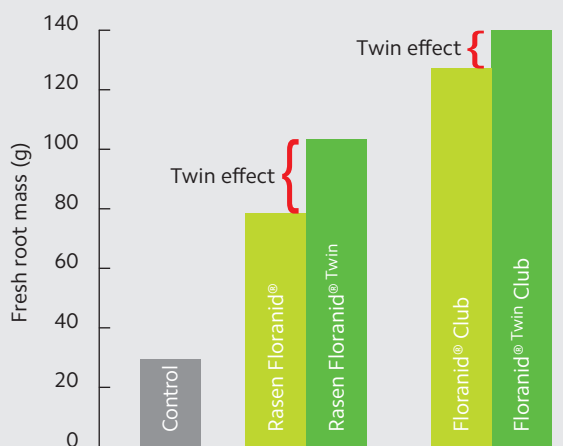
Labor Rittmo, France, 2013



## 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.

Fig. 3: Influence of Floranid® Twin on root growth

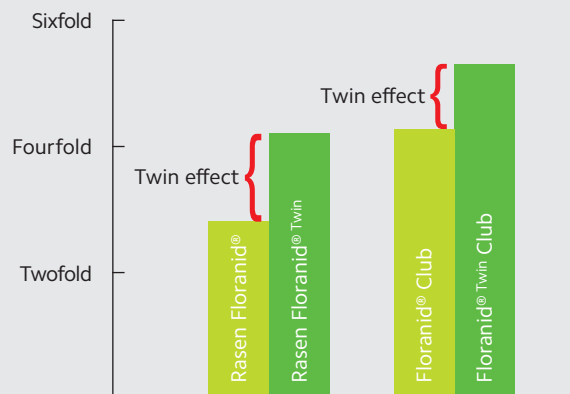


GIE Fleurs et plantes du Sud Ouest, Bordeaux, France, 2015

## 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 fertiliser promote these physiological processes and ensures the growth of strong and resilient plants.

Fig. 4: Influence of Floranid® Twin on the storage of reserves in roots

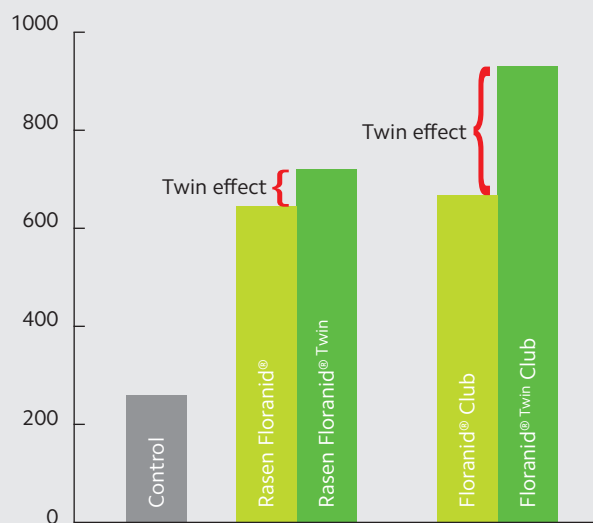


Parameter: Organic carbon (g)  
Increase relative to unfertilised control specimen

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



Fig. 5: Influence of Floranid® Twin on fertiliser efficiency



Dry matter content (g/plot/cumulative April-Sept.)

STEPP Research Institute Brittany, France, 2014

## Qualitative properties of Floranid® Twin

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



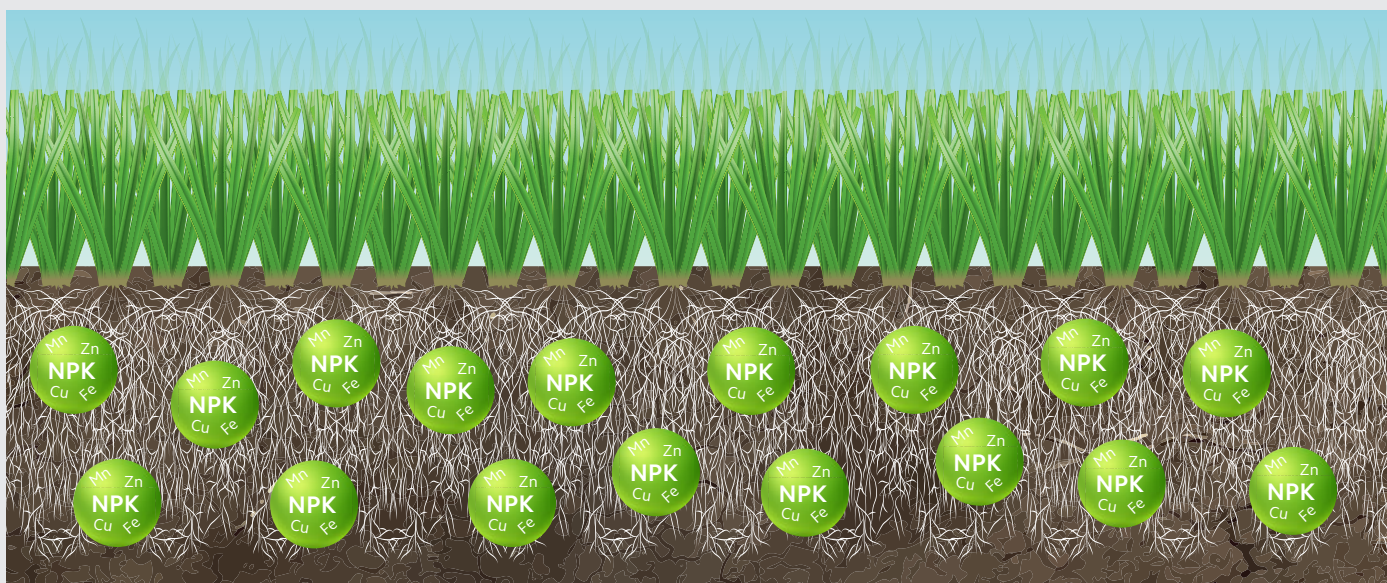
### Granulometry

Floranid® Twin fertilisers 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 fertiliser into the sward and the root zone (Fig. 6).

### Granule size

Floranid® Twin fertilisers 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.

Fig. 6: 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 fertilisers 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.

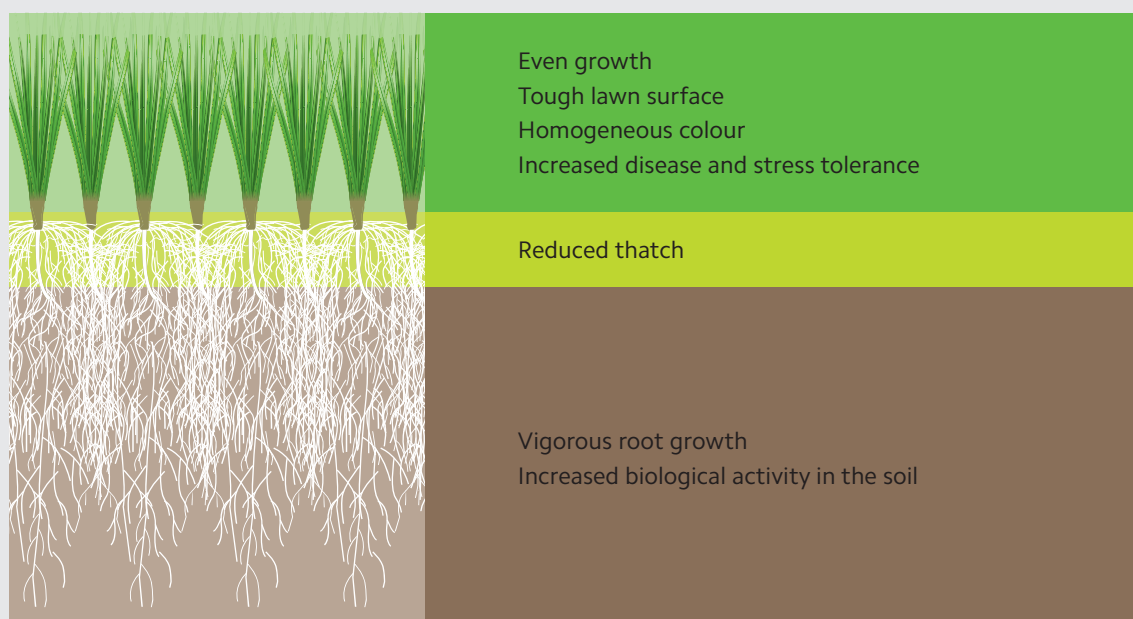
### Increased levels of trace elements

Trace elements perform essential functions in a plant's metabolic processes and promote disease resistance. In the development of the Floranid® Twin fertilisers, 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 fertilisers 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

Fig. 7: Floranid® Twin fertilisers act at every level



## 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 fertiliser concept based on Floranid® Twin products ensures a sustainable and efficient supply of nutrients for best functionality.

### Fine granules (Sports Grade)



### Mini-granules for Eagle products (Greens Grade)



**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.

For Basafilm® Twin Gazon, the Double N Technology granules have a flexible coating (40% of the granules) to give extremely long-lasting action. In combination with the effects of Floranid® Twin, this coating technology provides a particularly mild and long-lasting effect. In many cases, one application is enough. Perfect for recreational turf areas and new constructions before laying the turf.

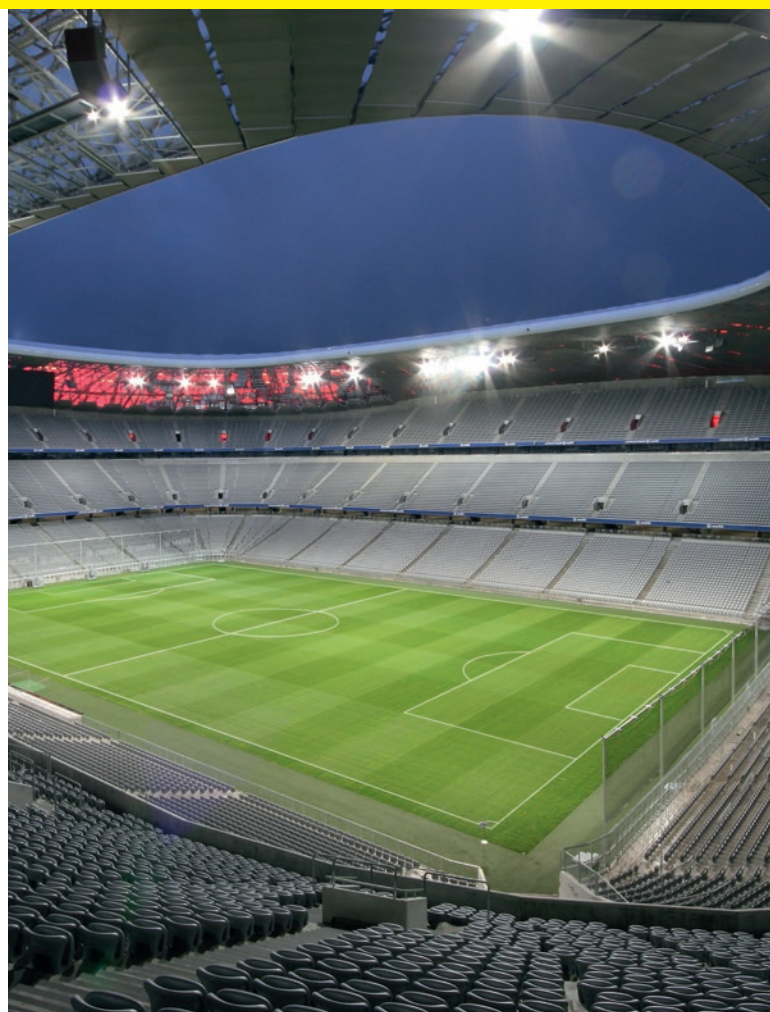
The Floranid® Twin product range is divided into fine granular quality (Sports Grade) for normal spreading applications and mini-granules (Greens Grade) for particularly fine distribution of the fertiliser granules on low-cut turf, such as putting greens. These products bear the additional name "Eagle".



## 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.



Product name	Formula	Special characteristics	Main use
Basafilm® Twin Gazon	19+5+8(+2+7) with micronutrients	High-nitrogen fertiliser, also comprises 40% coated granules for optimal slow-release action and tolerance	High-quality lawns and show areas, roof greening, railway lines
Floranid® Twin Turf	20+5+8(+2+7) with micronutrients	Lawn fertiliser 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+8) with micronutrients	Universal complete fertiliser 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+11) with micronutrients	Phosphate-free NK fertiliser 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+9) with micronutrients	Powerful, high-potash, slow-release complete fertiliser. Especially suitable as an autumn fertiliser	All planting in public green spaces, sports fields and golf courses, plant nurseries, commercial horticulture
Floranid® Twin Tree Vitality	9+5+20(+4+9) with micronutrients	High-potassium complete tree fertiliser 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 mini-granules (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+7) with micronutrients	Lawn fertiliser with an ideal composition	Low-cut turf, e.g. putting greens, pre-greens, and tees; high-quality turfed areas
Floranid® Twin Eagle NK	17+16(+2+8) with micronutrients	Phosphate-free NK fertiliser 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+6+24(+2+8) with micronutrients	Powerful, high-potash complete fertiliser. Provides resistance to cold conditions. Ideal as an autumn fertiliser	Low-cut turf, e.g. putting greens, pre-greens, and tees; high-quality turfed areas
Floranid® Twin Eagle Start	18-24-5(+2) with micronutrients	High-phosphate complete fertiliser. Improves rooting.	Low-cut turf, e.g. putting greens, pre-greens, and tees; high-quality turfed areas



