



Potting soils

Organic Fertilization and Soil Life

www.dcm-info.com





DCM

The Reliable Partner for Potting Soil Producers

40 Years of Experience

Founded in 1976, the Belgian family-owned company has over 40 years of experience in developing, producing and marketing high-quality organic fertilisers and soil improvers.

A team of enthusiastic and qualified collaborators is at your disposal to provide you with customised advice or to help you solve specific problems.

In-House R&D

The in-house R&D department in collaboration with the research center Scientia Terrae consistently tries to harmonize respect for the environment with an effective fertiliser action.

Moreover, DCM products are continuously subjected to quality controls and scientific trials conducted by independent institutes as well as to field testing.

State-of-the-Art Production

The annual production volume of over 30.000 tonnes is produced entirely in the ultra-modern and fully automated production facilities in Grobbendonk.

Each of the meticulously selected raw materials is precisely dosed. Quality and traceability are guaranteed at all times.

Sustainable Production

DCM continues its efforts to consolidate its environmental footprint while improving its production efficiency and sustainability.

The production process and the production facilities for DCM **MINIGRAN**® organic fertilisers are designed to provide maximum energy efficiency and heat recovery with minimum energy consumption. During production, no wastewater is discharged. Ask your adviser for more information.

Markets Worldwide

DCM is a solid partner of many potting soil producers in Europe and abroad. DCM **MINIGRAN**® products are used in growing media for:

- young plant production
- forest nurseries
- ornamental tree nurseries
- floriculture
- potted plants
- vegetables
- herbs
- soft fruits
- urban green
- landscaping
- home & Garden

Range for Growing Media

DCM offers you a wide selection range of fertilisers, adapted to the needs of your customers and their plants' needs, in a unique small microgranule, called **MINIGRAN**®:

- organic fertilisers
- vegetal fertilisers
- organo-mineral fertilisers
- soil improvers
- soil-life stimulators
- specialty products



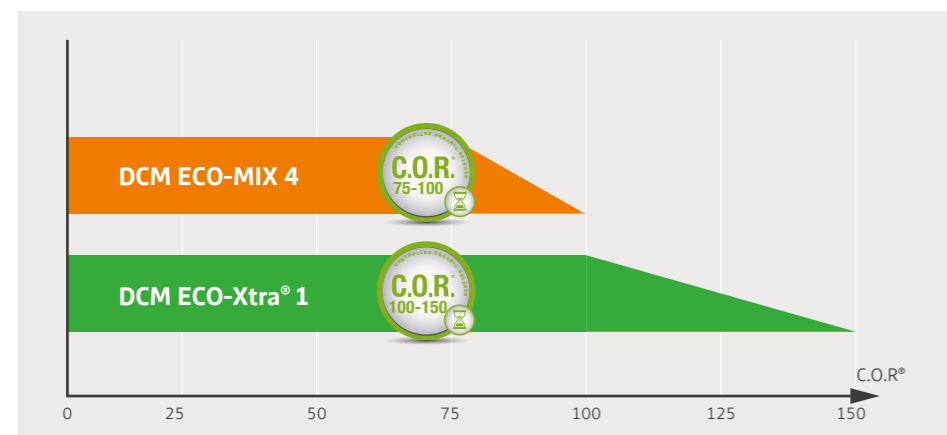
MINIGRAN® FERTILISERS

Natural Technology for Plant and Soil

For the production of its organic and organo-mineral fertilisers, DCM has meticulously selected more than 30 different high-quality, stable and dried organic **ingredients** of animal and plant origin, in accordance with all applicable legislation. Most of these raw materials are derived from residual flows from the food industry. By using these materials, DCM is giving them a second life.



To characterize the duration of effectiveness of its organic fertilisers, DCM introduces the **C.O.R.® value (controlled organic release)**: the number of days during which the fertiliser releases its nutrients in a controlled and gradual manner. The knowledge of the exact composition and release pattern of each ingredient in DCM fertilisers and the variety of raw materials in one single formula ensure **consistent and reliable fertilization**.

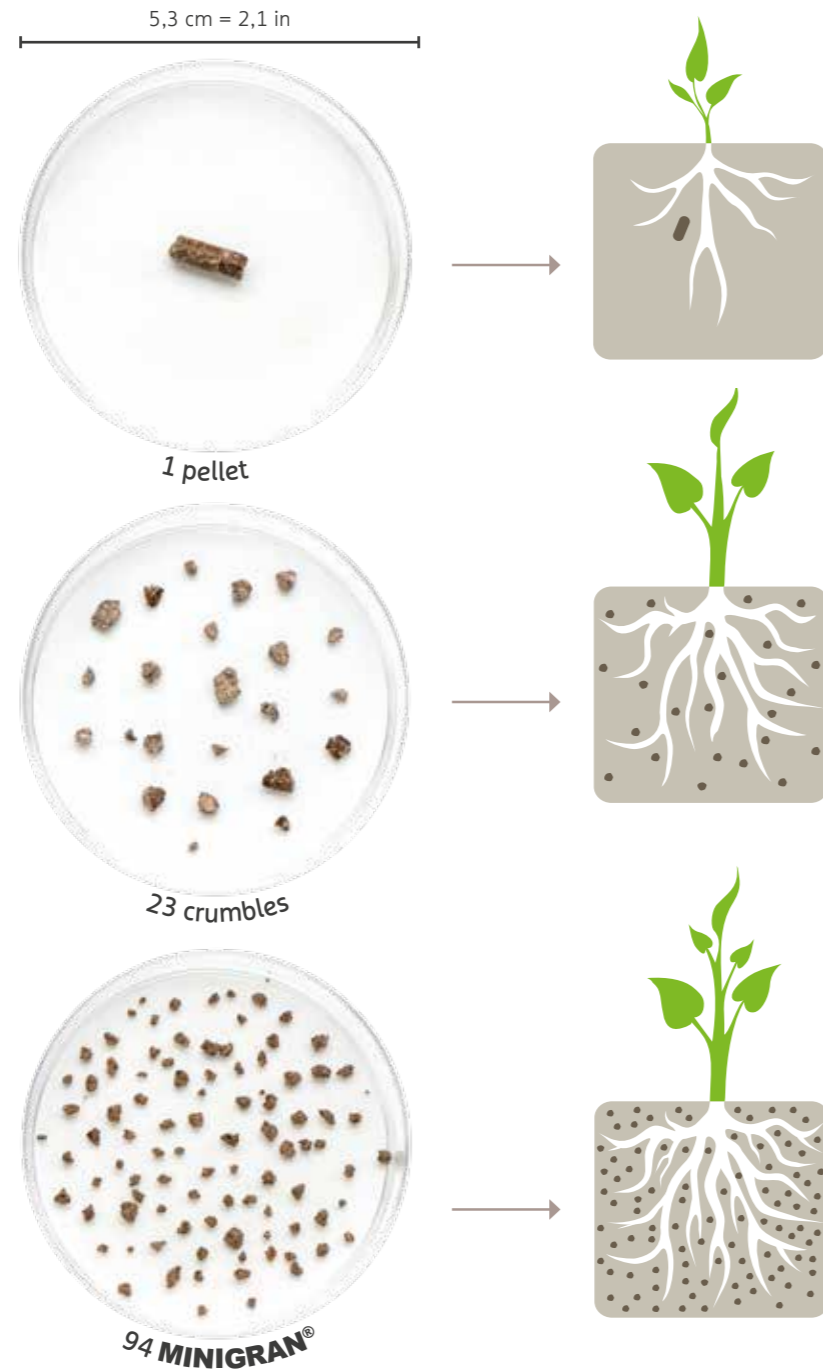


Nutrient release trial, Scientia Terrae, Sint-Katelijne-Waver, Belgium.



A multitude of high-quality ingredients in **MINIGRAN®**

Distribution of 10 kg/100 m² as a function of particle size.
Full scale two-dimensional image.



Better distribution and plant growth
thanks to **MINIGRAN**

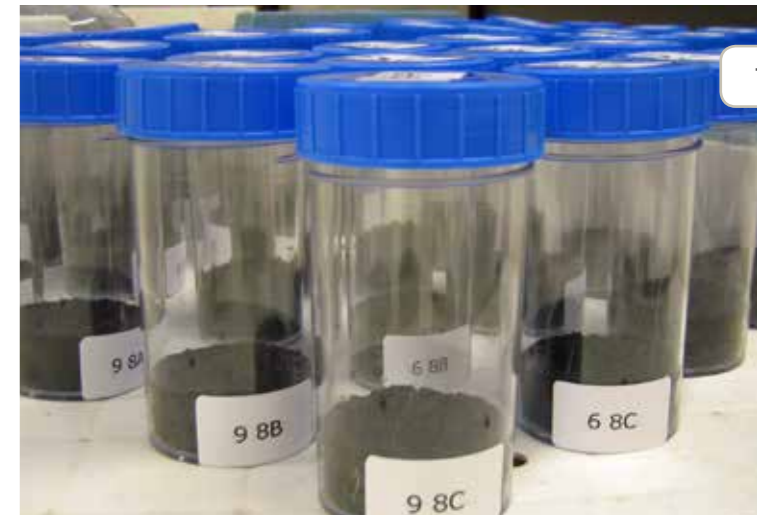


Thanks to a unique production process, DCM is currently the only manufacturer to produce organic fertilisers in a microgranular form, free from fractured surfaces (hence, little risk of dust): DCM **MINIGRAN**® TECHNOLOGY.

- **Homogeneous composition:** each granule contains all the **nutrients (NPK) in the same ratios** (non- blended)
- Dimensions between 800 and 2500 microns, of which at least 80 % between 1000 and 2000 microns
- Density between 560 and 700 g/L
- **Easy dosage** in growing media production installations
- In comparison with organic fertilisers in pellet or crumb form, these small dimensions ensure up to **60% more effective distribution** in growing media
- **Good distribution**, even in small volumes of growing media (trays, block potting substrates)
- For uniform growth and for plants at equal stages of development
- The various nutrient forms also promote development of stronger plants (see page 14).



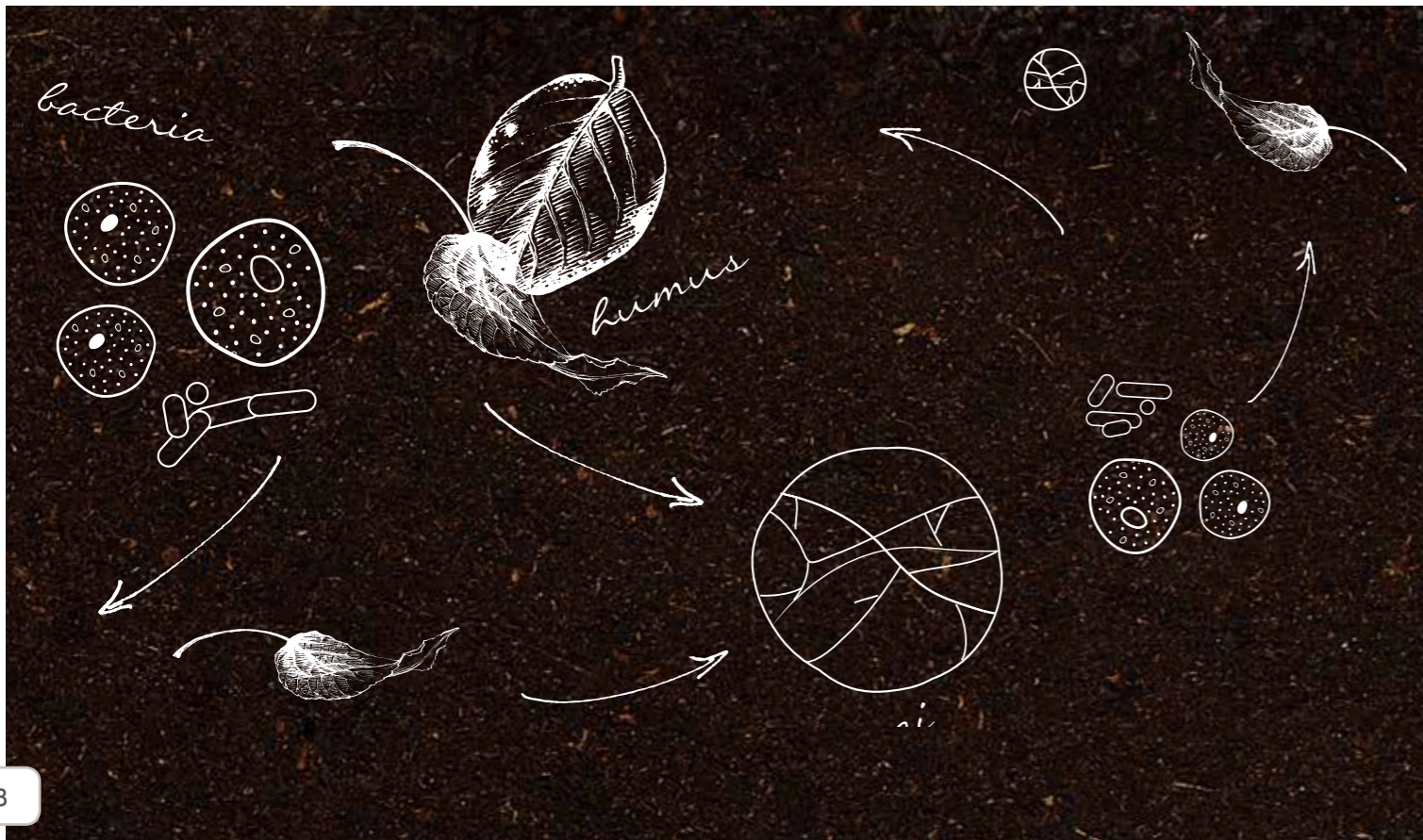
The nutrient release pattern of the organically bound nutrients and naturally occurring trace elements of each selected ingredient is defined in **DCM's Nutrient Release Model**. Thanks to the knowledge of all these characteristics, DCM can carefully combine different ingredients to obtain fertilisers with a long-lasting and controlled nutrient release. The release patterns of the DCM Model are also tested in relation to release patterns measured by different laboratories under various conditions (oxygen, temperature, substrate composition, etc).



Unlike mineral nutrients, the organically bound nutrients do not dissolve in the soil. They become available to plants by the natural activities of beneficial soil micro-organisms. Several official trials have shown that DCM fertilisers **leach significantly less** than pure chemical fertilisers. Thanks to the gradual release of the nutrients and the synchrony between the release of the nutrients in the organic raw materials of DCM fertilisers and the uptake of these nutrients by the plant, no nutrients go to waste. Consequently, groundwater and surface water are not polluted by nitrogen, phosphorus and potassium leaching. Therefore, a **higher efficiency** of the applied fertiliser is achieved.



Experiment Prunus laurocerasus 'Otto Luycken', Scientia Terrae, Sint-Katelijne-Waver in cooperation with Proefcentrum voor de Sierteelt (Research Centre for Ornamental Plants), Destelbergen, Belgium, 2010



Potting soils are composed mostly of inert raw materials (peat, perlite, coconut, husks mineral fertilisers etc.), that are characterized by a poor soil life, both with regard to the number and the diversity of the beneficial micro-organisms. These **micro-organisms are very useful** because: they convert organic matter into nutrients for each other and for the plants. Moreover, the mutual activities, dynamics and competition among the different organisms slows down harmful organisms. As a consequence, **diseases will have less chance of developing.**

For this reason, it is important to pay sufficient attention to the **microbial activity and diversity in the growing medium.** In a healthy and fertile substrate with a diverse and active soil life, plants benefit from a better balance of nutrients and improved nutrient release. The susceptibility to pathogen attack will also decline. Plants develop a healthier root system and grow more robustly, resulting in a lower rate of plant loss.



DCM VIVISOL®

Organic soil improver + *Bacillus spp.* – 60 % OM

MINIGRAN® TECHNOLOGY

1-3 kg/m³

- DCM VIVISOL® is a unique product to improve and stimulate the beneficial microbial activity diversity in the potting soil.
- Its **MINIGRAN®** form ensures a homogeneous distribution in the growing medium for a good effect throughout the entire pot !

+BACILLUS spp.



What is DCM VIVISOL®?

- *Bacillus sp.* including *Bacillus amyloliquefaciens* (10⁶ CFU/g)
- Inoculated onto vegetal raw materials, rich in organic matter

What is the effect of DCM VIVISOL®?

- Creates ideal soil conditions: both physically and biologically
- Guarantees rapid colonization of the rhizosphere
- Releases phosphorus and makes it available to plant roots
- Optimizes the health of plants and roots
- Produces stronger plants characterized by improved growth and quality
- Scientific research proves added value for many crops



Violet fertilized with DCM VIVISOL and DCM ECO-MIX 4, France, 2014

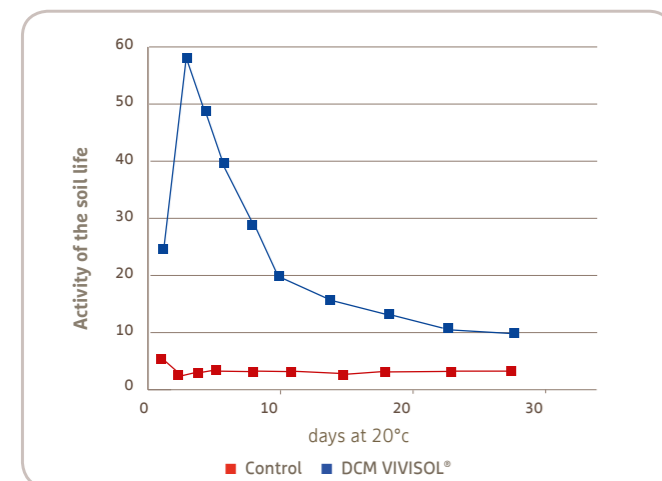


Maple (Acer) fertilized with DCM VIVISOL and DCM ECO-Xtra 1, the Netherlands, 2016



For a more active soil life

DCM VIVISOL® consists of a sophisticated combination of both rapidly decomposable and stable organic matter. One week after the application of DCM VIVISOL®, the **activity of the soil life is clearly stimulated**. The soil life uses the rapidly decomposable organic matter to multiply, whereas the stable organic matter increases the humus content in the soil. Several months after application, the soil life is still 50% more active compared to the untreated control treatment.

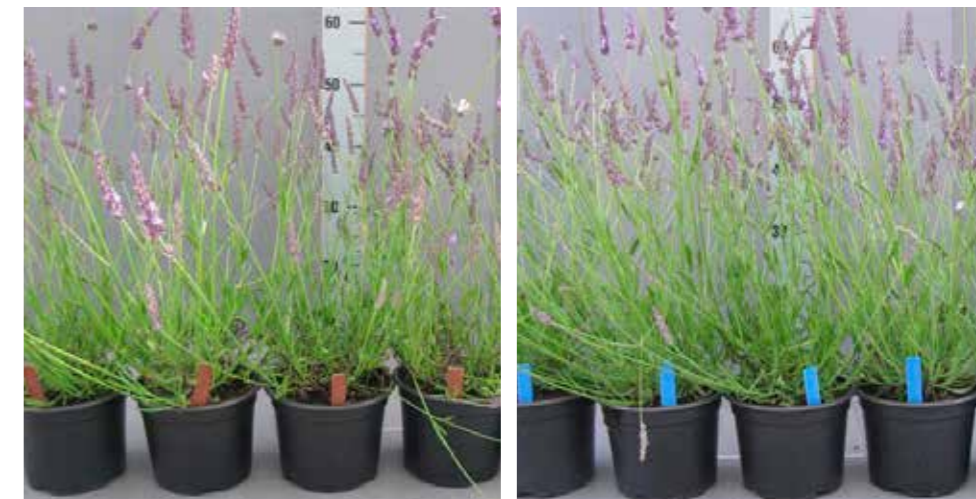


Soil life activity determined by measuring the microbial respiration rate, (mg C-CO₂ / kg / day) Scientia Terrae, Belgium, 2009



For better nutrient availability

The soil micro-organisms, stimulated by adding DCM VIVISOL®, convert organic matter into nutrients for themselves and for the plants. During these soil processes, humic and fulvic acids are naturally released. The nutrients in the soil as well as those provided through fertilization (such as phosphorus) become and remain more available to plant roots. The result: **increased efficiency of the applied fertiliser and better plant growth!**



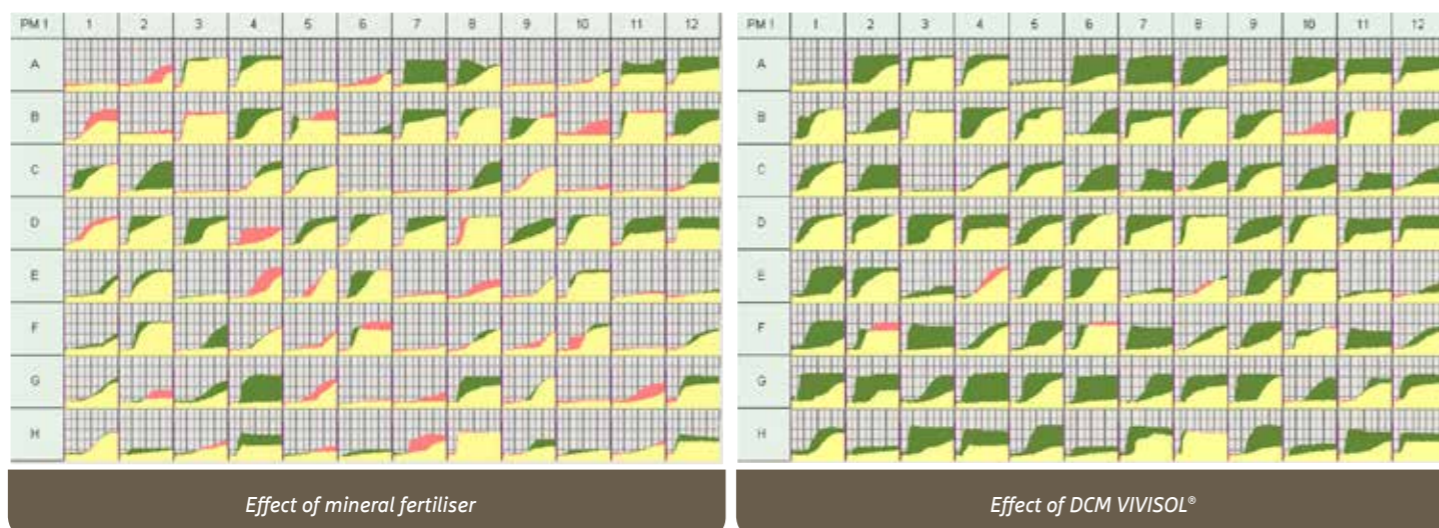
Standard fertilization

Extra DCM VIVISOL® MINIGRAN® (2 kg/m³)

Application of DCM VIVISOL® MINIGRAN®, *Lavendula angustifolia* 'Grosso' (P9), DLV Plant, Boskoop, the Netherlands, 2015

For more biodiversity

Each group of the soil ecosystem, such as beneficial bacteria and fungi, has its specific function and prefers certain carbon sources to feed on. The following incubation test has proven that DCM VIVISOL® **stimulates the development of a more diverse bacterial soil life**. By adding DCM VIVISOL®, the complete range of 31 different carbon sources is rapidly degraded and used as energy source by the soil life (green). In the untreated object (yellow), the degradation process is slower and not all the carbon sources are decomposed. The red colour indicates a reduced microbial activity compared to an untreated potting soil.



Effect of mineral fertiliser

Effect of DCM VIVISOL®

Activity and diversity of the microbial soil life measured by BILOG Ecoplates on 31 different carbon sources (in triplicate + 3 control wells), Scientia Terrae, in cooperation with Biolog Service Laboratory@PME&BIM, Catholic University of Leuven, Belgium, 2014



DCM organic fertilisers also stimulate the beneficial soil life!

The organic compounds in DCM fertilisers are dried and not composted and therefore attract a wide range of microbial communities. This way, they are able to stimulate the soil biodiversity and soil life, which is a guarantee for a healthy soil balance. Moreover, specific microbiological strains can be inoculated. **DCM's Soil Fertility Model** visualizes the attractiveness to soil-related micro-organisms.



Improved Rooting



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DCM VIVIFOS®

NP 4-30 – 13 % OM

MINIGRAN® TECHNOLOGY

1-2 kg/m³

The phosphorus release from organic and mineral phosphorus sources in DCM VIVIFOS® is not purely a physical dissolution process. It is a **continuous and gradual release process** over a period 6-8 weeks, involving the soil life. In combination with the acid secretion from the roots, the degradation by the soil microbes causes a local pH decrease around the fertiliser granule where **phosphorus and other nutrients can be taken up more easily**. Thanks to its **MINIGRAN®** form, DCM VIVIFOS® can be mixed **uniformly into the substrate**.

- for good and uniform rooting, throughout the entire pot
- more fine fibrous roots
- better plant growth and plants with more energy
- to mix in as an extra base fertilization



Standard fertilization

Standard fertilization + DCM VIVIFOS®

Orchid, Maasland, the Netherlands, 2014

DCM VIVIFOS® ensures **better rooting** under difficult growing conditions:

- bare-root plants
- seedlings and cuttings
- indispensable for plants with rooting problems and sensitive roots
- growing media with low porosity, such as compressed block potting soil
- plants that are potted in early spring, in cold temperatures
- irrigation water with a high Ca level: organic phosphorus will not precipitate with the Ca, Fe and Al in the substrate or the irrigation water



Standard fertilization + 0,75 kg/m³ DCM VIVIFOS®

Standard fertilization + 1,5 kg/m³ DCM VIVIFOS®

Photinia fertilized with slow release coated fertilisers and extra DCM VIVIFOS®, the Netherlands, 2016

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DCM ECO-FOS

NP 4-23 - 32 % OM

MINIGRAN® TECHNOLOGY

1-2 kg/m³

- organic phosphorus source
- suitable for organic growing





Basic Fertilization for Conventional Growing



The organic nutrients in DCM fertilisers are released through natural degradation by microorganisms in the growing medium and stimulate the activity and diversity of these organisms. Because the nutrients from this nutritional buffer are **released evenly and continuously**, the EC of the potting soil stays consistent: no salt shocks and no growth peaks. It is also possible to grow dryer. Contrary to fertigation, it is not necessary to give water to feed the plants. Trials have shown that less nutrients go to waste with the drainage water, which makes fertilization with DCM products **efficient and sustainable**.

MINIGRAN® ensures:

- proven faster **nitrogen** action for a quicker reaction on plant growth and colour
- unique **phosphorus** action: proven faster and better rooting and plants that are less susceptible to stress
- **potassium** has a long-lasting effect: better crop quality (weight, form, colour), sustained flowering and intense flower colours



Chrysanthemum fertilized with DCM ECO-Xtra 1 (5 kg/m³), Belgium, 2014



Standard fertilization

Fertilization with DCM VIVISOL® and DCM ECO-Xtra® 1

Roza fertilized with DCM VIVISOL® (1 kg/m³) and DCM ECO-Xtra 1 (6 kg/m³), the Netherlands, 2016



DCM ECO-MIX 4

NPK 7-7-10 – 50 % O.M.

MINIGRAN® TECHNOLOGY

2-4 kg/m³

- well-balanced **organic fertiliser**
- thanks to a wide variety of ingredients, the nutrients for the plants are released evenly and continuously over **75-100 days**
- compact and continuous growth for stronger plants



DCM ECO-Xtra 1

NPK 8-5-6 – 60 % O.M.

MINIGRAN® TECHNOLOGY

2-8 kg/m³

period of action up to 50 % longer!

- **organic fertiliser** complexed with specifically selected natural plant extracts
- provides continuous and uniform plant nutrition over a period of **100-150 days**
- is not coated and contains no synthetic inhibitors
- can be used in higher doses than conventional fertilisers without risk of burning or leaching
- extremely suitable for plants with high nutrient requirements, that are also sensitive to (overly) high salt concentrations at the start of the cultivation.
- crops with a longer growing seasons will need less (frequent) top dressing, which will reduce labour costs



DCM MIX 2

NPK 7-6-12 + 4 MgO – 33 % O.M.

MINIGRAN® TECHNOLOGY

2-4 kg/m³

- **combination of organic and mineral** ingredients
- for plants with a high nitrogen demand, at the start of the crop
- for crops in open air or in greenhouses at colder temperatures
- extra 4 % magnesium (MgO) for intense green leaf colour



Primula fertilized with DCM ECO-MIX 4 and DCM ECO-Xtra 1 in a peat-reduced substrate, Hochschule Weihenstephan-Treisdorf, Freising, Germany, 2015



Begonia fertilized with DCM ECO-Xtra® 1 (3 kg/m³), Tordas Feldhoffer garden, Hungary, 2015



Basic Fertilization for Organic Growing

For organic growing different formulas are possible. These NPK-fertilisers provide the substrate with a basic nutritional buffer from which nutrients are continuously released.

The product choice depends on the NPK and period of action needed by the crop, but can also be adapted in proportion to the concentrations contained in the raw materials that have been used to produce the substrate.

DCM organic NPK-fertilisers in **MINIGRAN®** can be mutually combined, but can also be used in combination with DCM ECO-FOS, DCM MICRO-MIX or DCM VIVISOL®. Ask for our specific advice.



DCM ECO-MIX 1
NPK 9-5-3 – 65 % OM
MINIGRAN® TECHNOLOGY
2-4 kg/m³



DCM ECO-MIX 3
NK 12-3 – 80 % OM
MINIGRAN® TECHNOLOGY
1-4 kg/m³



DCM ECO-MIX 4
NPK 7-7-10 – 50 % OM
MINIGRAN® TECHNOLOGY
2-4 kg/m³



DCM ECO-Xtra® 1
NPK 8-5-6 - 60 % OM
MINIGRAN® TECHNOLOGY
2-8 kg/m³



period of action up to 50 % longer!



DCM ECO-Plant 7
NPK 6-3-4 + *Bacillus sp.* – 64 % O.M
MINIGRAN® TECHNOLOGY
2-4 kg/m³



- fertiliser made of **vegetal raw materials with natural phosphate**
- **extra *Bacillus sp.***: colonize the rhizosphere, release phosphorus present in the substrate and make it available to plant roots
- balanced basic or top dressing
- for continuous growth, good rooting and quality plants



Celery fertilized with DCM ECO-MIX 4, DCM ECO-MIX 1 and DCM ECO-FOS, France, 2012



Poinsettia fertilized with DCM ECO-MIX 3 (3 kg/m³) in a peat-reduced substrate, Staatsschule für Gartenbau in Stuttgart-Hohenheim, Germany, 2015



Extra Micronutrients?



Although trace elements are only needed in very small quantities by the plant, they are of vital importance for good growth and development. DCM MICRO-MIX has been developed for plants susceptible to deficiency symptoms and is suitable for use in organic growing.



DCM MICRO-MIX

Mix of micronutrients – 58 % OM

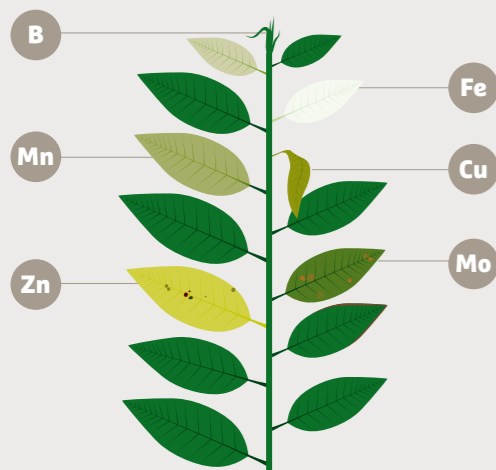
MINIGRAN® TECHNOLOGY

150-300 g/m³



- micronutrient fertiliser : 0,25 % B + 0,25 % Cu + 1 % Fe + 0,5 % Mn + 0,02 % Mo + 0,4 % Zn
- in **MINIGRAN® TECHNOLOGY** = easy to distribute in growing media
- each **MINIGRAN®** granule contains the trace elements in the same proportions
- trace elements: prevent and solve deficiency symptoms
- the vegetal raw materials can serve as a temporary buffer for the micronutrients, making them less susceptible to immobilization and leaching
- nutrients are released according to plant needs

DCM MICRO-MIX: Each Nutrient Its Own Function



Name	Symbol	Function
Boron	B	→ stabilisation cell wall structures → transport carbohydrates
Copper	Cu	→ present in chloroplasts → elektron transfer photosynthesis
Iron	Fe	→ synthesis chlorofyll → part of redox enzymes
Manganese	Mn	→ activation enzymes → nitrogen metabolism
Molybdenum	Mo	→ slows down nitrate accumulation → import in phosphorus metabolism
Zinc	Zn	→ formation of auxin → part of enzymes



Certifications



DCM has been **certified** by the Federal Agency for the Safety of the Food Chain (FASFC) for the **production** of organic and organo-mineral fertilisers and organic soil improvers. Business entity unit : 2.012.658.839.

For its production site in Grobbendonk, DCM has an **operating permit**, called VLAREM licence (Vlaams Reglement inzake Milieureglementering, Flemish Regulation on Environmental Permits), issued by the Province of Antwerp.

The DCM **self checking system** has been **certified** by the FASFC and is subjected to an external audit every year.

CSR (Corporate Social Responsibility)

Within the scope of the local project 'CSR/Environmental Charter Province of Antwerp', DCM has worked out some issues that are significant for the company and that go further than planned in the existing legislation. Medio 2014, an independent evaluation committee has granted the CSR/Environmental Charter to DCM.

ISO 14001

In 2014, the environmental management system of DCM has been certified by Lloyd's Register (Certificate n°: ANT1440017/EMS). During an annual follow-up audit, it will be checked if the implemented system is followed consistently, and if it really leads to a continuous increase of environmental performance.

RHP

Since the end of 2013, DCM meets the international requirements established in the RHP Quality mark for organic and organo-mineral fertilisers in the field of application 'RHP Horticulture / RHP Consumer', which is a guarantee for quality and reliability. The corresponding audit is performed by MPS-ECAS, an independent certification body. The products following these rules are marked in this brochure with the RHP sign.

ORGANIC

DCM fertilisers suitable for organic production only contain raw materials authorized in Annex I & II of the European Regulation EC 889/2008. Control bodies such as Certisys, CUC Control Union Certifications, etc., check the incoming raw materials by means of an Input Programme and certify the final products that are produced with these raw materials.





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