Introducing a new generation supplement for turf
For many years Scotts has been developing and trialling biological products for use on turf in conjunction with independent authorities. The result of this development work is ‘Scotts Vitalnova’.

Vitalnova is a totally new generation supplement for your turf. Based on the advanced and proven science of carbohydrate and seaweed nutrition, it works with nature to stimulate a healthier and more vigorous root zone. The benefits to turf have been proven during independent trial work and user trials. Root mass was significantly increased as was soil micro flora, especially indigenous mycorrhizas.

Vitalnova is also a direct source of energy to the grass plant by increasing the carbohydrate levels within the grass plant.

Quicker emergence time of grass sown from seed, and grass vigour was increased during establishment. When used within an overall turf maintenance programme Vitalnova has shown increased grass sward density, vigour and turf quality.

**Increase in bacterial populations**
Vitalnova provides a readily available energy source to beneficial organisms. Increased bacterial levels help improve the natural composting process and give a constant supply of nutrients to the plant.

**Increase in Mycorrhiza**
As well as supplementing free-living microorganisms in the soil, Vitalnova has been proven through research to stimulate the activity of other beneficial microorganisms – mycorrhiza fungi.
The liquid bio-stimulant for a healthier and a more vigorous root zone

Benefits of Vitalnova

Vitalnova is a liquid bio-stimulant product based on:
- Carbohydrate nutrition
- Scotts unique seaweed
- Micronutrients

Benefits of Vitalnova include:
- Directly increase carbohydrate levels within the grass plant
- Increase in soil Bacterial Populations
- Increase in Mycorrhizas numbers
- Improved root structure
- Faster seed emergence & establishment
- Improved growth of seedlings
- Improved nutrient cycling
- Helps with decomposition of organic material
- Release of ‘locked-up’ nutrients

Uniform response: above graph shows an increase in root mass on all 18 holes. Trial work carried out by Royal Holloway, University of London.

**Improved and healthier root structure**
The heart of Vitalnova’s performance lies in its beneficial effects on root growth. Trials have shown that supplementing turf with Vitalnova significantly increases root mass and structure. The performance was also very uniform which is rare for biostimulant type products.

Faster grass seed emergence
Applications of Vitalnova to newly sown grass can significantly improve the emergence time from seed of a range of grass species.

**Trials have shown Vitalnova significantly increases root mass and structure**

**Emergence time: 30% improvement**
Emergence was classed when over 40% of the sown sample was visible with the naked eye.

<table>
<thead>
<tr>
<th>Hours</th>
<th>Agrostis</th>
<th>Festuca</th>
<th>Lolium</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
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<tr>
<td>50</td>
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<tr>
<td>150</td>
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Control | Vitalnova

**Seedling vigour (growth): upto 38% improvement**

<table>
<thead>
<tr>
<th>Vigour</th>
<th>Agrostis</th>
<th>Festuca</th>
<th>Lolium</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<tr>
<td>8</td>
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</tbody>
</table>

Control | Vitalnova

**Improved vigour of newly established grass seed**
The vigour of newly sown grass has shown to be improved after applications with Vitalnova. Vigour was assessed visually for one month after germination.
**To be used within your overall turf maintenance programme**

The top few centimetres of soil are teeming with life. Beneficial microorganisms re-cycle decaying organic matter to release a constant supply of nutrients to the soil. Modern-day pressure on turf can create a near sterile environment under which microbial activity is suppressed and the rate of this natural re-cycling can be slow.

**Mycorrhizal levels**
The levels of mycorrhiza in soil decreases as the intensity of management increases. The height of cut is an important factor as this restricts the amount of carbon that can moved from the leaves to the roots. Anaerobic conditions in the turf caused by compaction and the build up of black layer can also restrict the bacterial and fungal populations – which like every other living organism needs oxygen to survive.

<table>
<thead>
<tr>
<th>Bacterial levels:</th>
<th>Low Value (cells per g soil)</th>
<th>Low Value (cells per g soil)</th>
<th>Average (cells per g soil)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soil type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acidic (pH range 4.5-6.0)</td>
<td>200.000</td>
<td>1.000.000</td>
<td>600.000</td>
</tr>
<tr>
<td>Neutral (pH range 6.5-7.5)</td>
<td>800.000</td>
<td>4.000.000</td>
<td>2.000.000</td>
</tr>
<tr>
<td>Alkaline (pH range 7.5-9)</td>
<td>1.000.000</td>
<td>6.000.000</td>
<td>3.000.000</td>
</tr>
<tr>
<td>USGA Spec (80% sand, 20% peat)</td>
<td>8.000</td>
<td>100.000</td>
<td>60.000</td>
</tr>
</tbody>
</table>

*Note: The average quoted is an average across all greens on courses of that soil type, whilst the low and high values are the extremes of lowest and highest counts recorded.*
Important bacterial functions within the soil

Bacteria have a number of functions within the soil, one of the most important roles is within the nitrogen cycle;

**Nitrogen Fixation**
This is the natural fixation of atmospheric nitrogen gas either by lightning or nitrogen fixing bacteria. All of these fix nitrogen, either in the form of nitrate or in the form of ammonia (NH\(_3\)).

**Mineralisation**
This is the bacterial conversion of organic N to the ammonium ion.

**Nitrification**
This is the conversion of ammonium-N to nitrate-N by microbial action. Mineralisation and nitrification processes increases the amount of N available for plant uptake.

**Immobilisation**
The reverse of mineralisation and nitrification process is called immobilisation. It takes mineral nitrogen and converts it to organic form.

**Ammonification**
Release of ammonium-N from soil organic matter by microbial action.

**Mycorrhizal Function**
Mycorrhizal fungi form close associations with plant root systems. Arbuscular mycorrhizas (AM) form internal structures in the roots and transfer nutrients to the plant in exchange for carbon compounds from the plant.

The benefits of AM colonization are increased nutrient uptake and the stimulation of root production. These Arbuscular mycorrhizal types can only obtain carbon from their host plant so it is important to maintain this carbon supply. The action of mowing reduces the plants ability to produce carbon compounds and so this has a negative effect on the carbon supply to the mycorrhiza. If the mycorrhizal development is restricted, the supply of nutrients to the plant from this source will also be restricted. By adding a direct source of carbon to the plant this imbalance can be corrected, and so maintain an optimum nutrient/carbon exchange between plant and fungi.

**Increased nutrient uptake and stimulation of root production**
Arbuscular mycorrhiza structure

Programmed approach
Scotts know that to manage turf effectively many different jobs have to be carried out. Maintenance work such as aeration, topdressing, scarification etc. is vitally important and is essential for the creation of healthy turf grass. Vitalnova does not replace any of these important treatments. It is part of the overall turf maintenance programme that helps to improve rootzone and turf quality.
Using Vitalnova

Vitalnova is an easy to use liquid spray and can be applied using conventional equipment. It is applied in a minimum water volume of 200 litres/hectare.

**Recommended use period**
The product should be applied in good growing conditions and when the soil temperature is above 10°C for the first application, visible improvement may take a while to appear. Do not start the programme if turf is under stress or going into dormancy. For best results, applications should be watered-in to achieve thorough soil penetration. This programme should be used in addition to your usual fertilizer programme.

<table>
<thead>
<tr>
<th>Use</th>
<th>1st Application</th>
<th>2nd, 3rd, 4th Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over seeding</td>
<td>45 litres/ha in minimum of 200 litres water; 5-14 days after sowing.</td>
<td>25 litres/ha in minimum of 200 litres water; 20-30 days after 1st application.</td>
</tr>
<tr>
<td>Full programme / Maintenance</td>
<td>50 litres/ha in minimum of 200 litres water.</td>
<td>Follow with 25 litres/ha in minimum of 200 litres water; at approximately 5-6 week intervals.</td>
</tr>
</tbody>
</table>

An entire fertilization programme for your golf course

The majority of Scotts products fall within the category of slow release fertilizers. Sierraform®, Sierrablen® and Sportsmaster® are distinguished by the patented technologies that ensures the grass gets the right feed at the right moment. Greenmaster® is a conventional release fertilizer with fine granules producing a reliable and rapid response in the grass. When greenkeepers use Scotts fertilizers they can make sound forecasts on the results of the treatment, making their job easier and more satisfying. Because surge growth is prevented, uniform root development and top growth in particular are more harmonious. This improves the structure of the grass and increases stress tolerance in all conceivable situations.
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Scotts International B.V. is certified according ISO 9001 and ISO 14001.