



Cultivation and Technology

The Emmen-based company N-xt Fertilizers has been operating in the Netherlands for almost 20 years. It started as a franchise of an originally American concept, but it has been independent for the last 6 years. When it comes to fertilising, the company has its own unique strategy. It is founded on the vision of 'improved cultivation results and healthier food production start with a fertile soil'. Arnold van Woerkom is a potato grower who has embraced these principles with good results for 16 years already. The icing on the cake is supplying his own W16 potatoes to various hospitals in the Netherlands. The main reason is that they contain 30% more minerals. Mr van Woerkom and Marco van Gorp, Technical Director of N-xt Fertilizers, explain why that is.



Potato grower Arnold van Woerkom has embraced the principles of N-xt with good results for more than 16 years. The icing on the cake is supplying his extremely healthy W16 potatoes to various hospitals in spotless white bags.

It is more than 16 years ago that potato grower Mr van Woerkom radically changed the fertilising strategy for his arable farm. In the years before the government had introduced a policy attempting to curb excessive use of fertilisers. "I thought they had a point. In those years we, the growers, were largely working with the aim 'to put enough on' and not with 'what does a potato plant need exactly?'. In a search for a suitable fertilising strategy, Mr van Woerkom started talking to Marco van Gorp of N-xt Fertilizers. "Marco was telling me that he does not take the potato plant as his starting point for feeding, but the soil. That vision was right up my street. I had already come to the conclusion that we were on the wrong track with excessively sprinkling salts, such as calcium-ammonium-nitrate. Salt does not only feed a plant, it is a preservative too. By adding salt to food products, they can be kept longer. Salt stops the development of fungi and bacteria; people have known that for a

long time. It works in the same way in the soil – too much salt kills and/or inhibits the growth of soil organisms, bad ones and good ones. The latter has to be prevented." According to Messrs van Woerkom and van Gorp, the theory is simple. If the chemical mineral balance in the soil is at its best, the structure and soil life are also in order and the plant grows in the best possible way. You harvest healthy products with a wide range of minerals that are essential to humans and animals. "In order to achieve that you have to ensure that the supplied organic matter/green manure decays properly. This happens in three phases. In the first phase it is important to give the organic matter time to decay on top of the soil. Then the decayed remnants and minerals slowly seep down to 5-7cm deep. Then you enter the second phase, conversion by soil life. In the third phase the organic matter has been converted and sinks below 7 centimetres. Now the plants are able to absorb the minerals."

Less leaf development

A potato plant that is growing in the best possible way looks quite different than you may be used to with standard SSP fertilisation. "I really had to get used to that in the beginning. I was used to a dark-green crop with a strong canopy and thick stems. However, when you administer less nitrogen – and you would be doing that with a fertiliser like N-xt N+P with trace elements – the leaf development is a lot less lush and the leaves do not colour up quite so dark. Is this going to be okay? I worried after that first year. Later, after yield measurements, you realise that your fears were unfounded. The kilogram yields per hectare were exactly the same as the plots with traditional fertilisation. However, with the difference that N-xt fertilisers produced more tubers in the more lucrative seed-potato grades. However, that was not the only benefit of soil fertilisation. In those days I supplied seed potatoes of the Ramos variety to the Farm Frites growers co-



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operative. They purchased the starting material for growing potatoes for fries from three or four seed-potato growers. This growers cooperative had a similar cooperation with a cultivation consultancy TTW in Oude Tonge. This company collected data for the growers cooperative, including of seed potatoes. This demonstrated that our Ramos always produced one stem more per plant and more than 1.2 tubers more per stem. They told me at a meeting with TTW that for the seven years of cultivation the Ramos variety, 6 years had produced significantly greater harvests of fries potatoes than those of colleague seed-potato suppliers. I was surprised by these results too. That evening they asked me about the reason why the seed potatoes had so much more vitality. I could not really give them a scientific answer, only the explanation of fertilising differently. I did not find that answer satisfactory and the next year I decided to run a test myself. I had my own Ramos seed potatoes grown by a colleague seed-potato grower in comparable soil that was fertilised traditionally. I had the harvest analysed in terms of components and compared it with the seed potatoes from my own N-xt fertilised soil. This demonstrated that there were 30% more minerals in the seed potatoes I grew than in those grown with traditional fertilisation." The information exchange with the Farm Frites growers was also about the cost-benefit picture. As seed-potato grower I paid more in fertilisation to achieve that better quality.

So I made a proposal to the group of growers. I said, suppose you achieve 10% more yield with my seed potatoes, would it be asking too much for me to receive 2% in additional price for my seed potatoes. The group of growers immediately accepted this proposal, but the trading company that was dealing with sales on my behalf did not feel like paying more. That same year I got talking to a chef of a large hospital by complete coincidence. We got talking about potatoes and I told him my story of the content. I also explained to him that there were more vitamins, antioxidants, anti-allergens and substances that stimulate the intestinal flora. He was extremely interested and asked if I could show him the figures and supply a few potatoes. That's how it came about that I now largely grow table potatoes for hospitals." Mr van Woerkom has even developed a new variety for this purpose that is still without a name, but registered under number W16. He now only grows seed potatoes of that variety. It concerns a cross between the varieties Red Star and Laura. This produces a red-skinned potato with deep yellow flesh. Laboratory tests have demonstrated that the dry-solids distribution of the tubers is extremely even. You can see this in the even structure when you cut the tuber. The W16 is a little floury after cooking and has a creamy slightly salty taste. The latter is striking, as Mr van Woerkom has been using N-xt fertilisers for more than 16 years and does not add salts to his

crops. The grower attributes the slightly salty flavour to the many extra minerals in his spuds. Growth and sales of the W16 are now going so well that he is cultivating 16 hectares of this variety. In order to meet the growing demand, he still cultivates 6 hectares of Laura. He stores the entire harvest in crates at his own company and supplies table potatoes in hospital-white paper bags.

Start with the soil

What Mr van Woerkom experienced in benefits is not just limited to this practical example, but is supported by many other subsectors such as starch farming and many studies that have been carried out with the N-xt fertilisation method. The order is as Mr van Woerkom explained, says Marco van Gurp, the expert. "We start with the soil, so the first thing you need is a proper soil analysis. We believe that you can only give your crop proper nutrition when the soil is fed properly too. In simple terms, we start with soil fertilisation, and then the potato plant comes into the picture. The soil analysis we have performed is different to what most growers are used to. We use the American Kinsey-Albrecht analysis. We send soil samples to a laboratory in the United States.

We receive an analysis that is focused on the mineral balance of the soil. At the top of the result form you can see the most important measurement percentages for calcium and magnesium. If you are below the target levels, the idea is to fertilise accordingly and when the percentages are in order, you must keep them that way. Calcium, magnesium, but potassium and sodium too, are important, because they are proportionate to the structure of the soil. The ideal picture is a clay-humus complex with 60-70% calcium, 10-20% magnesium and 2-5% potassium, depending on whether it is sand or clay. That leaves 10% room for hydrogen, which determines the pH of the soil. Good soil fertility is determined by the presence of macro-elements and micro-elements in the right proportion. This produces the correct acidity, the correct salt level and opportunities for plants to absorb minerals. Macro-elements, apart from calcium and magnesium, include potassium, sulphur, nitrogen and sodium. Micro-elements include trace elements,

such as boron, copper, manganese, cobalt, silicon, zinc, iron and molybdenum. These micro-elements produce strong plants, they also make the plant more resistant to plagues and diseases, and produce plants/seeds/fruits/tubers with healthier contents”, explains Marco van Gurp.

It is all interlinked

“It is not simply administering products such as N-xt that help to create optimum soil chemistry”, underlines the fertiliser expert. “In the soil the chemistry is important, but the structure and the biology are equally important. You need several measures to get them or keep them at the right level, such as not working the soil too hard, using good crop rotation, adding organic matter or lime. Experiences, such as those of grower van Woerkom, teach us that when you use all the measures you improve the inner quality of the product and the effects of plagues and diseases are reduced. It is all interlinked”, emphasises Marco van Gurp. On the new N-xt website www.vruchtbarebodem.nl, there is information about the human body too. “Over the last 50 years we have noticed a strong reduction in the mineral, antioxidant and vitamin levels in our basic foods. We believe that people benefit from a healthy diet and you can only achieve that when the food is healthy and the soil in which it grows”, argues Marco van Gurp. Results of recent studies demonstrate this too, as we learn by trawling through the website. Measurements of wheat demonstrate that the iron content of grains fell by 10-15% between 1970 and 2000. The magnesium level fell by 20-25%, whilst zinc levels plummeted by 35-40%. This is caused by fertilisation and exhausting the soil, but also by hybrids developed for the purpose of

yield. Possible causes include selecting for the highest possible wheat yield and exhausting the soil. The consequences can already be seen in people. Some 60% of all Americans suffer from magnesium shortages. According to the RIVM, this figure is 20-30% of inhabitants of the Netherlands. If the soil lacks trace elements/minerals, they do not occur in sufficient amounts in food either nor in humans or animals. The share of trace elements in the human body, assuming a body weight of 70 kg, is 8.6 gram in total. The amount required to control chemical processes and to keep our body truly alive can be read on the website vruchtbarebodem.nl.



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For more information about N-xt Fertilizers
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