N-TESTER IN ACTION

Partnerships | Knowledge | **Solutions**

Precision farming contributing to sustainable food production

Increasing food production to meet the needs of the world's growing population, currently 6.7 billion and set to reach 8.2 billion by 2050, is one of the major challenges confronting the world. On the face of our planet the land suitable for agriculture is limited and its extension into other areas, such as decertified or forest covered lands, often raises environmental problems.

The optimisation of crop quality from existing agricultural land is therefore essential to meet the growing world population food needs. Achieving the necessary balance of quantitative and qualitative crop production in a sustainable way lies in what is known as the 'precision farming' concept. Precision farming is based on providing crops with exactly the right amount of fertiliser needed at each stage of their growing cycle, thereby preventing the rinse-off of excess nutrients, thus preserving the quality of both the soil and water resources. And, that fertiliser need is determined by measurements taken directly from the crop itself.

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To convert arid land puts unsustainable pressure on available water resources and adversely affects communities already suffering from water shortage. Moreover, gaining agriculture land from deforestation would accelerate global warming as forests play a vital role in absorbing CO_2. Also, a significant loss of trees in the environment can lead to erosion and unstable soil conditions, with an increased likelihood of damaging landslides.

Preserving soil quality and water resources of agricultural lands while optimising yields is therefore key to addressing the world food challenge. In this context, the sustainable use of mineral fertilisers plays an essential role

Precision farming, through the optimal use of fertilisers, enables farmers more effective and efficient use of their existing land to increase crop size and quality. In assessing the correct level of fertiliser for crops such as wheat, barley and rye, of which nitrogen is of prime importance, the farmer is now aided by the N-Tester. The N-Tester is a hand-held device enabling the simple and fast measurement of a crop's chlorophyll content, which is the key indicator of its nitrogen status. Requiring only 30 quick leaf measurements across a field and within a few minutes it provides the farmer with a precise measure of the crop's exact N-fertiliser needs.

Use of the N-Tester is a significant advance on the methods currently practised. Soil sampling and laboratory analysis are time intensive and costly. Judgement of fertiliser needs based on the farmer's personal experience, is complicated by the introduction of new crop species each year. Recommendations of fertiliser producers cannot always take into account differences in soil quality or changing climatic conditions. While a combination of the farmer's judgement and the producers' recommendations are still important, the N-Tester gives more accurate information to support them.

Nitrogen testing improves fertilisation practice

As a fertiliser solutions provider and long-term partner for farmers, Borealis Agrolinz Melamine initiated a project in 2002 to evaluate the N-Tester among 40 Austrian farmers. This has been carried out in conjunction with Yara, the N-Tester producer; RWA Raiffeisen Ware Austria AG, a marketer of farming products and the Agentur für Gesundheit und Ernährungssicherheit (Agency for Health and Food safety).

"From this small beginning approximately 130 farmers are now actively using the N-Tester device," says Wolfgang Hofmair, Marketing Manager, Borealis Agrolinz Melamine. "This is of course still a small number when set against the 70.000 full-time farmers in Austria. Cost of the device may have been part of the reason for this slow take-up but this is changing as some farmers are joining together to share an N-Tester."

One of the first to use the N-Tester was Franz Kastenhuber who is both the owner of a 30 ha farm, 30 km west of Linz, and a lecturer at the Lambach Agricultural School where he uses the N-Tester in his teaching. "Precision farming is the future," he says. "But changing the way farmers think and act takes time. Therefore it's vital to convince the young farmers of tomorrow of its value and the importance of tools, such as the N-Tester, in its success."

Use of the N-Tester is already seen to be changing the way farmers are using fertilisers, with their application balanced according to crop needs over the usual three fertilising periods: before the winter, in April and in May. For example, instead of using 70-80 kg of N-fertiliser for the first fertilisation, he might now need to apply only 40-50 kg. However, overall the total quantity of applied fertilisers might remain the same and simply be distributed differently across the three fertilising periods depending on crop N-measurements.

To increase the benefit of using the N-Tester, Borealis Agrolinz Melamine has established a database of crop measurement information from farms across Austria. Access to the database gives the farmer an overview of actual fertilisation needs in his area.

Increasing yields, preventing rinse-offs

The key is that soil fertilisation specifically measured to crop needs not only results in improved yield, but this more precise balancing raises crop-quality to benefit both farmer and consumer. According to Franz Kastenhuber: "The N-Tester has been a valuable complement in fertilising decisions and data from my own farm show a production increase of between 10-15%, as well as an improvement in yield quality." Better dosed, fertilisers are also fully absorbed by the plant and therefore risks of excessive nutrients rinse-off in water environment are further prevented.

"Borealis Agrolinz Melamine always seeks to work closely with farmers to improve the practice of fertilisation," says Wolfgang Hofmair. "Our commitment is to maximising farmers' yields and the quality of their crop while protecting the environment. That is the driver which ensures the sustainable success of our business."

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