

# Werkgroepen

## Jaarverslag 2009 KNPV Werkgroep Graanziekten

Nadat de werkgroep enige tijd niet bij elkaar was geweest, is er in februari 2009 weer een bijeenkomst georganiseerd. In mei 2009 hebben elf leden van de werkgroep graanziekten een tweedaagse buitenlandse excursie gedaan naar het Rothamsted Research Station in Engeland ([www.rothamsted.ac.uk](http://www.rothamsted.ac.uk)) waar interessante en zeer langdurige (>165 jaar) onderzoeksprojecten lopen op gebied van graanziekten (zie onderstaand verslag). In 2009 was Gert Kema (PRI) voorzitter en Huub Schepers (PPO-AGV) secretaris. De werkgroep telt 33 leden.

### *Visit of the KNPV Cereal Diseases Working Group to Rothamsted Research*

The KNPV Cereal Diseases Working Group visited Rothamsted Research in Harpenden (UK) on 28 May 2009. In total 11 participants of the working group from breeding companies, education, research and advisory service joined in the

visit. We arrived in Harpenden the evening of 27 May and enjoyed a pub meal while watching the Champions League final between Barcelona and Manchester United. After enjoying a good night sleep and English breakfast we were welcomed by the head of the Plant Pathology and Microbiology department John Lucas. He started with an analysis of the Champions League final and after that introduced Rothamsted Research and his department. Rothamsted is almost certainly the oldest agricultural research station in the world. Its foundation dates from 1843 when John Bennet Lawes, the owner of the Rothamsted Estate, appointed Joseph Henry Gilbert, a chemist, as his scientific collaborator. As a young man, Lawes had been interested in the effect of fertilisers on crop growth and, in 1842, started the first factory for the manufacture of artificial fertilisers. Lawes was not only a successful entrepreneur, he was destined to become one of the great Victorian scientists. The scientific partnership between Lawes and Gilbert lasted 57 years, and together they laid the foundations of modern scientific agriculture and established the principles of crop nutrition. In 1843, they started the



## VERGADERING



first of a series of long-term field experiments - some continue to this day. The main object of these experiments was to measure the effect on crop yields of inorganic and organic fertilisers. These so-called "Classical Field Experiments" such as Broadbalk (winter wheat) and Park Grass are an increasingly valuable experimental resource for today's scientists. They are the oldest, continuous agronomic experiments in the world ([www.rothamsted.ac.uk](http://www.rothamsted.ac.uk)). Furthermore, Rothamsted monitors insect behaviour (60 years data) and hosts the national Willow Collection (150 genotypes, 100 species) that is increasingly important for bio-energy research in the framework of the Centre of Bioenergy and Climate Change. Subsequently, several subjects were presented from the two main research topics of the department: namely (1) pathogen population biology and disease management and (2) wheat pathogenomics. In the 'Pathogen population biology and disease management' programme the research aims to understand at the population level the processes resulting in host specificity, pathogen variation in space and time, and the factors underlying epidemic development. Evolutionary changes in pathogen populations, such as the emergence of new pathotypes, and the development of fungicide resistance, are a

key focus. The main objective of the research is to devise sustainable management strategies for major diseases of arable crops. This includes delivery of information directly to growers and the industry to guide decisions on the best options for disease control. The target pathogens in this programme are the fungi responsible for the most damaging diseases of cereals and oilseed rape crops in Europe. These include leaf blotch diseases (*Mycosphaerella* on wheat, *Rhynchosporium* on barley), eyespot of cereals (*Oculimacula [Tapesia] yallundae* and *O. acuformis*), and powdery mildew (*Blumeria graminis*). Oilseed rape pathology focuses on the two currently most important fungal diseases, stem canker (*Leptosphaeria maculans*) and light leaf spot (*Pyrenopeziza brassicae*).

In the "Wheat pathogenomics" programme the research aims to identify common themes permitting fungi and viruses to attack wheat and the key plant components orchestrating defence responses. This has been achieved by functional genomics approaches, such as homologous recombination for fungal gene knockouts, *Agrobacterium*-mediated fungal transformation, fungal transcriptome analyses, exploiting diploid wheat, TILLING and EcoTILLING to assess allelic diversity and by comparative wheat, rice and

maize array experiments. Unusually, the group will focus equally on defining the function of both plant and pathogen genes. Understanding these systems at the cellular and the whole plant level will lead to new options for crop improvement and disease control.

Finally, the fungicide research group presented an overview of their program with a focus on the application of historical Broad Balk samples – tracing back to 1865 – to study the long term incidence of the cereal pathogens *Stagonospora nodorum* and *M. graminicola* in the United Kingdom. The decline of *S. nodorum* and the rise of *M. graminicola* coincided with changes in atmospheric pollution, mainly SO<sub>2</sub>. Furthermore, detailed genetic and epidemiological analyses of strobilurin and azole resistance in *M. graminicola* were presented.

After the finger lunch we visited the Manor and the Broadbalk classical experiment. The Manor has a long history dating back to the 13<sup>th</sup> century. It can now be booked for parties and banquets but also rooms are rented for students and guest workers. One of the participants lived in this Manor for several months during his study 15 years ago and had a quick look at his old room. Nothing had changed!

The visit to the field experiments was interesting and very agreeable since the weather was very kind to us with a lot of sunshine and a nice temperature. The Broadbalk experiment had its first winter-wheat crop sown in autumn 1843, and this crop has been sown and harvested on all, or part, of the field every year since then. The experiment tests the effects of various combinations of inorganic fertiliser (supplying the elements N, P, K, Na and Mg) and farmyard manure on the yield of wheat: a control strip has received no fertiliser nor manure since 1843. Originally the weeds were controlled by hand weeding but later by periodically bare-fallowing and cultivating different parts of the field in different years. From the mid-1950s, herbicides have been used but they are withheld from one part of the field. Two major modifications were made from 1968. One was the introduction of modern, short-strawed cultivars. The second saw crops other than wheat being grown on the experiment, so that yields of wheat grown continuously could be compared to those of wheat grown in rotation. To accommodate this change, the experiment was divided into 10 sections; four continued in wheat whilst six were used to compare two 3-course rotations. There have since been further modifications and we now have: two sections growing continuous winter wheat; one section growing continuous winter wheat where the straw is chopped and incorporated into the

soil (on other sections, the wheat straw is baled and removed); one section in continuous winter wheat where no herbicides have ever been applied (on other sections, herbicides are applied routinely); one section in continuous winter wheat where since 1985 the use of pesticides has been restricted; and five sections testing the rotation oats, forage maize, wheat, wheat, wheat. We finished the visit with a demonstration of field experiments at 'Stackyard' comprising wheat take-all disease, variety trials and an experiment using *Triticum monococcum* as a source for new resistance genes to *M. graminicola*. After that we started our homeward journey and can look back on a very interesting visit to the oldest agricultural research station in the world.

Huub schepers, secretaris

## KNPV-werkgroep Bodempathogenen en bodemmicrobiologie

### *The meaning of life (in the soil)*

In het maartnummer van Gewasbescherming (2009) zijn negen pagina's gewijd aan de legendarische werkgroepbijeenkomst over 'Bioïet- sen voor het meten van ziektevering in grond' (najaar 2008). De samenvattingen van zeven presentaties, ingeklemd tussen een prikkelende inleiding en een kernachtige discussie, geven een goed beeld van *the state of the art* op dat moment.

De voorjaarsvergadering in april 2009 stond als vanouds open voor alle onderwerpen waar de werkgroepleden iets over kwijt wilden. Deze bijeenkomst bij FloraHolland in Bleiswijk telde slechts 14 werkgroepleden (een zeer lange, ingewikkelde wegomleiding was hier mede debet aan), maar de discussies waren er niet minder om. De samenvattingen zijn verschenen in het septembernummer van Gewasbescherming. De thematische aanpak van de najaarsvergadering is, na de uitermate positieve ervaring uit 2008, voortgezet op 29 oktober 2009. Het thema 'Methoden om te meten in grond' lokte dit keer 24 werkgroepleden naar Wageningen. Gastspreker Jaap Bloem van Alterra gaf een uiteenzetting over *The meaning of life (in soil)* die aan helderheid niets te wensen overliet. Zijn optreden werd beloond met een door de KNVP gesponsorde boekenbon. Er is een stevige discussie gevoerd rond diverse bodemindicatoren; meten is niet