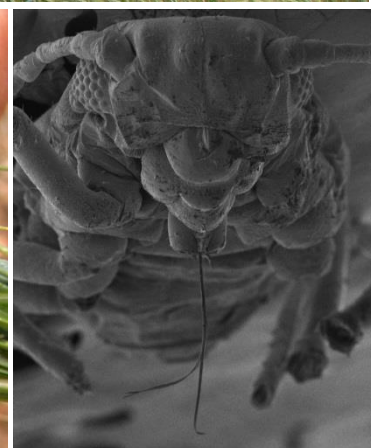
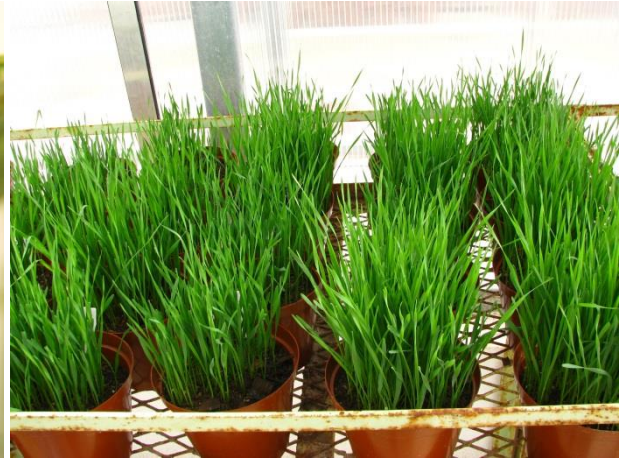


# CEREAL GENOMICS



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## The purpose of the Cereal Genomics group at Stellenbosch University

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The overall purpose of the Cereal Genomics laboratory here at Stellenbosch University is the improvement of cereal crops with a focus on drought tolerance and insect resistance. For the past 8 years we have been in close cooperation with commercial seed companies and research institutes to facilitate the development and release of resistant wheat cultivars so as to improve the overall quality and economic feasibility of wheat cultivation. To this end we endeavour to contribute to this goal through the study of insect pest diversity in the Western Cape so as to better understand how these insects are spread and how they compete with one another. A clearer understanding of the scale of insect pests and what their threat is to farmers of the Western Cape will allow us to deliver a more focused service, and in so doing, will allow for more intensive and economically feasible cereal production.

## What are our aims and how can this improve farming in the Western Cape?

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Currently there is little information available regarding the overall distribution and population structure of cereal aphids in South Africa. This makes it difficult to estimate the costs incurred by farmers both by the damage that these pests wrought, as well as the costs associated with the preventative treatment of applying pesticides. We thus aim to present a clearer picture of how detrimental cereal aphids are to the small grain farmers of the Western Cape and also determine the best practices for both farmers and commercial breeders.

To be successful in this endeavour we would like to request the following of small grain farmers of the Western Cape:

- To contact us in the event that an aphid outbreak is discovered on cereal crops (Mr Francois Burger will be the main contact for farmers, **(021) 808 5828, 082 045 8855** or [nfvburger@sun.ac.za](mailto:nfvburger@sun.ac.za)).
- If possible, avoid the application of insecticides until we have had a chance to come and collect aphids (will never take more than 48 hours).
- To allow us to move around on the affected area and collect both plant material and aphids (will be performed by ± 2 people and won't be more than 10 plants).
- To inform us of what insecticide was eventually used to treat the affected plants.

Under no circumstances would we want any farmer to suffer any damages, so if the outbreak is of such a nature that requires the immediate application of pesticides, we only ask to be informed as quickly as possible after said application to allow us to perform a field investigation.

## Our team



**Professor Anna-Maria Oberholster**

The Cereal Genomics laboratory, under the leadership of Professor Anna-Maria Oberholster, is leaders in the field of cereal and insect genomics. Professor Oberholster's research spans more than 20 years with over 100 publications and work experience in world renowned institutions such as the Weizmann and Salk institutes of the USA.

Email: [ambo@sun.ac.za](mailto:ambo@sun.ac.za)

Cel. no.:



**Dr Christoff Truter**

Dr Christoff Truter recently obtained his Ph.D. for his research in water toxicology and how pollutants affect aquatic animals with special focus on vertebrates. Other interests include water quality, reptiles and amphibians.

Email: [jctruter@sun.ac.za](mailto:jctruter@sun.ac.za)

Cel. no.:



**Mnr Francois Burger**

Mr Francois Burger is currently busy finalizing his Ph.D. in aphid genomics. His main interests include aphid-plant interactions with focus on genomic adaptations within both the aphid and its host.

Email: [nfvburger@sun.ac.za](mailto:nfvburger@sun.ac.za)

Cel. no.: 082 045 8855

Tel. no.: (021) 808 5828



**Mnr Hendrik Swiegers**

Mr Hendrik Swiegers is currently busy with his M.Sc. which focuses on the study and identification of insect resistance genes. His main interests include natural, as well as introduced, insect resistance in wheat and tobacco.

## Known small grain aphids of the Western Cape

### Russian wheat aphid (*Diuraphis noxia*)



**Feeds on:** Wheat, oats, sorghum, triticale, rye, barley and other grasses

- Damage:**
- Slow growth of wheat plant
  - Elongated yellow and white stripes on leaves
  - Rolling up of leaves that can trap the wheat ear
  - Necrotic spots
  - Do not transfer viruses

### Greenbug (*Schizaphis graminum*)



**Feeds on:** Mainly wheat and sorghum, but can also feed on barley, maize, millet, oats, rice, rye and many wild grasses.

- Damage:**
- Necrotic spots
  - Colour discoloration (red and yellow spots)
  - Spread a variety of plant viruses, including Barley yellow dwarf, Sugarcane mosaic and Maize dwarf mosaic.

### Oat aphid (*Rhopalosiphum padi*)



**Feeds on:** Oats, barley, rye, rice, maize, and many wild grasses.

- Damage:**
- Necrotic spots
  - Feeding leads to fungal infestation
  - Spreads a variety of plant viruses, including Barley yellow dwarf, Sugarcane mosaic, Maize dwarf mosaic, Ryegrass mosaic, Wheat mosaic as well as many others.

## Known small grain aphids of the Western Cape (*cont.*)

### English grain aphid (*Sitobion avenae*)



**Feeds on:** Wheat, oats, sorghum, triticale, rye, barley, maize, millet, oats, rice, rye and many wild grasses.

**Damage:**

- Delayed growth and ear formation
- Spread of fungus
- Distribute variety of plant viruses, including Barley yellow dwarf.

### Rose aphid (*Metopolophium dirhodum*)



**Feeds on:** Wheat, oats, sorghum, triticale, rye, barley, millet, oats, rye and many wild grasses.

**Damage:**

- Least damaging of aphids on cereal crops
- Spread of fungus
- Spread variety of plant viruses, including Barley yellow dwarf and Maize dwarf mosaic

### Corn leaf aphid (*Rhopalosiphum maidis*)



**Feeds on:** Wheat, oats, sorghum, triticale, rye, barley, maize, millet, oats, rice, rye and many wild grasses.

**Damage:**

- Rolled leaves
- Nutrition leads to fungal infestation
- Spread variety of plant viruses, including Barley yellow dwarf, Cereal yellow dwarf, Maize dwarf mosaic, Millet red leaf virus, Wheat mosaic as well as many others.