Chasing wheat yields in challenging environments

– ARC a proud member of IWYP

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With the increase in food prices over the last two decades, more frequent food riots and related deaths in countries that cannot meet local food demand, have become a global tendency.

Wheat remains one of the most important food crops after maize and rice in the world. The world wheat yield gain is currently stagnant at 1% per annum, while it needs to be in the region of 1,7% to 2% to meet the requirements of the growing population.

With the latest prediction models, depending on which trend is followed, the world population will reach between 10,5 and 16 billion by the year 2100. The new 2050 prediction is that the world will need 65% more food than what is currently produced.

This situation is far worse on the African continent, as 80% to 90% of the global population growth is expected to come from Africa. At the current agricultural productivity, it is predicted that Africa will only be able to meet 15% of its food demands in 2050.

A general consensus amongst agricultural researchers around the world is that the current global financial balance sheet for Research and Development (R&D) funding into agriculture is completely out of balance and an area of major concern for the future.

With this depicted growing demand for food by the world population, there is a drastic need for more R&D investment into global agriculture. So, the question remains: Can we alter the expected path of these prediction models with a global dedicated wheat yield improvement research agenda?

What we learnt: Challenges of climate change to wheat production

Research findings show that wheat yields drop with every increase in average night temperature, suggesting an even tougher battle for breeders ahead. Wheat is not responding favourably to the average increase in CO_2 levels.

The potential area for expansion to wheat production around the world is very limited. It is believed that the largest potential to increase global wheat production lies within emerging farmers of the developing countries of Asia and Africa. Research to improve the genetic yield potential of wheat is required to make the economics more favourable for the producers.

About IWYP

The International Wheat Yield Partnership (IWYP) was formed towards the end of 2014/2015. IWYP is a sub-initiated, but independent research programme of the International Wheat Initiative. Dr Jeff Gwyn (director: IWYP) and Dr Mark Sawkins (deputy director and research portfolio co-ordinator) based in Texas in the USA, in combination with their specialised research advisory committee, have been tasked with the difficult job to select needed research focuses for funded and aligned projects around the world.

Ultimately Drs Gwyn and Sawkins were appointed to manage and advise international funding bodies committed to the IWYP course to channel funds in the directions which is believed to give the needed scientific breakthroughs to achieve a significant jump in the genetic yield potential of wheat. IWYP members, its directors and scientific advisory board, promise to do things differently.

They aim to:

- Take a high risk/high reward approach.
- Take advantages of opportunities and technologies.
- Fund, align and partner-up.
- Ultimately focus on research outputs that can be applied directly on the farm for the wheat producers.

IWYP recently (20 - 23 March 2017) had its second Annual Scientific programme meeting in Obregon, Mexico where 60 wheat researchers around the world interactively met to discuss their latest research findings and the best collective way forward.

The ambitious mission of IWYP is to increase the global wheat yield averages by 50% by 2030.

Ms Bongiwe Nhlapho and I, both from ARC-Small Grain, had the opportunity to attend this second Annual IWYP meeting in Mexico, predominantly as a result of the funding received from the WCT capacity building initiative.

IWYP has the sole scope of improving the genetic yield potential of wheat through a series of high-risk/high reward research projects funded or co-funded by 13 international research and funding agencies.

Currently there are also nine private partners. The total value of the first eight IWYP funded research projects from the first call in 2015/2016 was around US $20 million. The funded and aligned projects involve various institutions and research teams in the United Kingdom, Australia, United States, Mexico, India, Argentina, Spain and now also South Africa.

In May 2016 Dr Annelie Barnard and I contacted Drs Gwyn and Sawkins directly via a telephone conference with the intention to become a member of the IWYP community. We proposed a new project with the aim to increase wheat yields in challenging environments.

This project was evaluated by an expert team of researchers and now, almost twelve months later, South Africa is proudly represented and a contributing IWYP member through the aligned projects channel. This aligned project is the first representation of any South African or African research institute on the IWYP programme.