

Field Excursion

Glen Agricultural College



Field excursion to Glen Agricultural College

Wednesday, 20 January 2015

13:30 – 14:00	Welcome & Divide into groups
14:00 – 14:30	Homestead garden demonstration with RWH&C
14:30 – 15:00	Commercial implementation of RWH&C structures
15:00 – 15:30	Cropland demonstration with RWH&C
15:30 – 16:00	Soybean cultivar trial
16:00 – 16:30	WEMA cultivar trial



Homestead garden demonstration with rainwater harvesting and conservation (RWH&C)

Vegetable production using in-field rainwater harvesting is demonstrated at an area that represents a typical size homestead gardens in a rural setting in the central Free State. A variety of vegetable crops and maize, as staple food, are produced throughout the year. The aim is to demonstrate that an average size family of 5 members can produce enough to have access to a nutrition meal all year round. At the on-site demonstration plot roof water harvesting is also practiced in order to provide crops with supplemental irrigation during periods of drought.

Commercial implementation of (RWH&C) structures

Various specialized custom build implements are used to implement various RWH&C structures. Implementation with no-till (NT), in-field rainwater harvesting (IRWH), Daling plough (DAL) and mechanized basins (MB) will be demonstrated.

RWH&C on croplands

In order to assess RWH&C techniques for improved cropland productivity in communal areas, on-station research is conducted at the Glen Agricultural College since 2008. For this trial five treatments are used, namely conventional tillage (CON) as the control, NT, IRWH, DAL and MB. IRWH and DAL are used as the rainwater harvesting techniques while MB and NT are used as the conservation techniques. The on-station statistical experiments are laid out in a randomized block design with four replicates. Maize is used as the indicator crop with a plant population of 22000 plants ha⁻¹. Fertilizer is applied at planting according to soil analyses. Standard weed and insect control practices is used. The parameters used to assess the different RWH&C techniques for cropland productivity are grain yield, rainwater productivity and gross margin. Results of the last six growing seasons have indicated that higher grain yields and rainwater productivities were obtained with the RWH&C techniques compared to CON or farmer's practices. Where the RWH&C techniques were used by small-scale farmers in rural communities their crop yields have increasing yields by 8 - 70% compared to CON.

Irrigated soybean cultivar trial

Although soybeans as a crop are growing worldwide, individual cultivars or genotypes demonstrate a limited adaptation to specific geo-graphical areas. The best-adapted cultivar is therefore the one that will, in the long-term, give the best yield and quality for a specific locality within a specific geographical area.

The soybean trials were planted for the 38th successive year during the 2015/2016 season by the ARC-Grain Crops Institute from Potchefstroom. This season's trial layout consists of a randomised block design with 3 replications and ± 30 cultivars.

The aims of the project:

- i. To compare cultivars for agronomic and economic performance;
- ii. To test the adaptability of cultivars and new releases for specific areas and cultivation practices.
- iii. To determine the risk and feasibility of the crop in specific areas.

The congress participants can expect to see specific differences between the wide range of cultivars, as influenced by the climate, soil type and pest interactions.

Evaluation of the performance of Water Efficient Maize for Africa (WEMA) cultivars under constrained environments of the Free State

The African Agriculture Technology Foundation (AATF) together with the International Maize and Wheat Improvement centre (CIMMYT), Monsanto and the national agricultural research systems in Kenya, Mozambique, South Africa (The ARC), Tanzania and Uganda, have embarked on a project to develop drought tolerant and insect protected maize varieties. The project is called Water Efficient Maize for Africa (WEMA).

Trials of WEMA Hybrid varieties were done in Western Cape, Kwazulu Natal, Northwest, Mpumalanga and Limpopo, and Free State provinces in 2013 by the ARC. The purpose of trials was to evaluate performance of different WEMA hybrid varieties under severe drought conditions and low nitrogen soils. Results of trials from all participating trials showed that the variety WE3127 was

most drought tolerant in comparison to all other varieties that were included in the trial. Though WE3127 is a hybrid, and hybrids usually perform poorly under low nitrogen soils, WE3127 performed well under nitrogen constrained soils. Its performance was better than that of the OPV's which are normally preferred for marginal soils. As a result of its performance, WE3127 was launched and is already available in seed companies, CAPSTONE seed.

Though performance of WE3127 under drought conditions was confirmed from preceding trials, the purpose of this trial is to evaluate the performance of WE3127 against conventional cultivars in Mangaung Metro, Thaba-Nchu in particular and Glen area being an on-station trial. This is because climatic conditions vary from area to area. The trial will be extended to farmers (on-farm) for adoption at a later stage since this new cultivar was specifically developed targeting smallholder farmers faced with challenges such as low rainfall which usually leads to drought, climate change that also influence the problem, and insect pests which affect yields for farmers with low or no resources to control them.

The trial was planted for the first time in December 2014 at Glen. Treatments used include four white maize cultivars (PAN 6Q-2450, WE 3127, PAN 5Q-749BR and BG 4201) and two fertilizer treatments (0 fertilizer and 150 kg ha^{-1} 6:2:1 (32) + 0.1% Zn). Each cultivar was repeated twice, planted with and without fertilizer. All cultivars were planted under dry land.

Objectives

- i. Evaluate and verify the performance of water efficient maize varieties against conventional cultivars under both researcher and farmer-managed conditions
- ii. To get feedback from farmers on the performance and acceptance of their varieties under farmers' conditions.