

GRAIN SA

Progress Report by:
CONSERVATION AGRICULTURE
FACILITATOR

For the period:
October 2017 to September 2018



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1. INTRODUCTION

Basic and applicable production research is of critical importance to achieve sustainable production through improved production efficiency in the grain industry. The development of new and improved technology through the means of on-going research is one of the corner stones of sustainable production. The introduction of Conservation Agriculture (CA) by Grain SA, financially supported by the The Maize Trust and the Winter Cereal Trust, is seen as one of the key strategic thrusts in this regard. Research on improved CA and/or crop production systems, *improved soil health*, integrated pest management, integrated soil nutrient management, integrated weed management and the integration of livestock, are some of the areas of vital importance.

In the light of the above-mentioned change in focus by Grain SA, it was decided to create a post within the structures of Grain SA, with the primary purpose to facilitate the promotion of CA among grain producers in South Africa. It was decided to fund this post through The Maize Trust. Dr Hendrik Smith was appointed in this position in January 2013 as CA Facilitator and one of his first major tasks was to develop a comprehensive strategy that will serve as a framework for accessing and managing funding (and projects) for CA over the short, medium and long term. This report will cover the January to June 2018 period of business by the CA Facilitator.

2. LONG TERM OBJECTIVES

2.1. Development of Conservation Agriculture (CA) Farmer Innovation Programme (FIP)

The objective was to investigate all approaches, models and mechanisms in order to develop the best possible strategy for the management and coordination of projects and initiatives that will assist in the promotion of CA among grain producers in South Africa. The bulk of this investigation took place during January and February 2013, however specific aspects are still continuing to evolve as more information and experience is gained. The major milestones are briefly discussed below.

2.1.1. CA programme conceptualisation

The current understanding has been confirmed that crop (maize) production research and development (R&D) to improve natural resource management (through CA) does not follow a linear process. An innovation systems (IS) perspective to R&D reveals that the actual change and innovation processes are much more complex and diverse. IS extends beyond the creation of knowledge to encompass the factors affecting demand for and use of knowledge in novel and useful ways.

The above-mentioned implies that it is unlikely that complex, multi-component technologies such as CA can be successfully scaled out (mainstreamed) through traditional linear models of R&D. Instead they require the development of IS to adapt technologies to local conditions. Accordingly, and at the very least, the emphasis has to be on various aspects of the system, of which on-farm research and the inescapable experiential and social learning that this generates are key elements; both of which critically place the farmer in the central role.

Following the above statement, the new CA programme at Grain SA has been designed and described under the paradigm of IS and was named the CA Farmer Innovation Programme (FIP). The main purpose of the CA FIP is the mainstreaming of CA by and through grain farmers to ensure sustainable use and management of natural resources while enhancing national and household food security and income.

The FIP has been designed to facilitate and coordinate access to funds for key and interested stakeholders (including farmers) who wish to adapt, develop, or adopt innovations on practices, topics and issues focused on CA. Access to such funding allows a wide range of CA innovations to be tackled, and under proper conditions may expand enthusiasm and innovation capacity among farmers, other rural stakeholders, and those who support them, ultimately facilitating the mainstreaming of CA within the grain industry.

The CA FIP facilitator has been given the mandate by Grain SA / The Maize Trust / Winter Cereal Trust to list the following Key Strategic Objectives (KSO's) for the foreseeable future. These KSO's and themes will be reviewed and/or improved on a continuous basis:

- a) Diagnosis and documentation of CA systems
- b) Awareness, Marketing and Access to Information
- c) Farmer-centred Innovation Systems Research
- d) Incentive and Market Based Mechanisms (IMBMs)
- e) Education and Training
- f) Innovation Platforms, Networks, Social learning, Brokering and Facilitation

The Grain SA FIP facilitation and coordination in CA innovation will be through solicited and non-solicited projects funded by The Maize Trust (MT). Proposals will be invited and submitted in accordance with the MT funding cycle, i.e. by 31 March and 30 September each year. Once they are received by MT, they are directed to Dr Smith, who will coordinate the MT CA panel to assist with the evaluation of the projects according to specific FIP criteria.

2.1.2. Stakeholder communication and involvement

A range of stakeholders have been engaged with as part of a national and international stakeholder network. One of the major initiatives is the development of a Grain SA CA working group, primarily comprising CA farmers and technical co-workers involved in CA FIP projects. This working group will support the CA FIP in various manners; two meetings took place in this period, namely 22nd February and 19 September 2017. Grain SA made a decision to transform this meeting into a CA forum aiming to reach a much wider stakeholder group in sharing current CA FIP project results. The first CA forum meeting was held at the Grain Building on 18 September 2018.

The **Terms of Reference** of this meeting stays the same, as follows:

- Identifying funding priorities and target groups/areas
 - Identify projects in different regions
 - Coordinate projects in areas
- Represent CA-FIP in different regions – awareness and scouting for opportunities and needs
- Evaluation of proposals (with other selected 'experts' on panel)
 - Make inputs on technical matters – make sure that farmers' perspective counts
- Monitoring implementation and evaluating the impact of FIP projects
 - Reference Groups participation
 - Review of technical (progress) reports
 - Make inputs on technical matters – make sure that farmers' perspective counts
- Sharing of experiences and data – at awareness events, etc.
- Identify urgent (ad hoc) research & awareness needs

As part of their function to support MT to channel a portion of their funds towards CA research, the CA forum guided by the CA Facilitator at Grain SA (Dr Smith), has created a CA evaluation panel, comprising

a range of mostly local, but also international experts, to assist in the evaluation of new CA project proposals, as well as annual progress reports. A range of criteria have been developed for this purpose. These CA panel members will be involved in the CA forum as far as possible.

Grain SA also forms part of a national network of CA stakeholder, such as the National CA Task Force (NCATF), which is aiming to advance the promotion of CA in South Africa through various mechanisms and projects, involving various interested and key stakeholders in CA. At the moment the Directorate Land Use and Soil Management (LUSM) at DAFF serve as the secretariat for NCATF.

3. LONG TERM OBJECTIVES – PROGRESS FOR 2018

3.1. Description of CA systems in various Agro-ecological Regions

The main expected outcome of this process, is a clear and ‘pure’ description of the CA farming systems (or CA agro-ecosystems) practiced in specific areas or agro-ecological zones (AEZ). It is envisaged that this information (structure and content) could form the basis of any further documentation and updating of information in future, which could also serve as a source document or ‘living manual’ for farmers interested to start CA in any specific area or AEZ. In this respect an informal agreement has been made with popular magazines, such as SA Grain/Graan, Landbouweekblad, Farmers Weekly and the KZN No-till Club newsletter, to document and publish as many of these successful ‘case studies’ as possible. A number of articles have been published already.

The articles on CA published in the SA Grain magazine are all available from the Grain SA website (which include a new site specifically for CA accessible at <http://www.grainsa.co.za/grain-research/conservation-agriculture>). Furthermore, the publication of the CA series on Integrated Crop-Livestock Systems in web-based Volumes has been funded by The Maize Trust and were also made available on the website and can be accessed here <http://www.grainsa.co.za/sa-graan-grain-article-series/conservation-agriculture>. A range of different institutions (e.g. the ARC and Universities) are also publishing increasing numbers of articles on CA in SA Grain and other journals/magazines. Many of these articles flow from the CA FIP projects, which have been generating a wealth of very appropriate information for producers and other practitioners.

3.2. Raising awareness on CA

General awareness (or sensitisation) has been experienced as particularly important to stimulate farmers getting involved with further learning activities, such as experimentation. The whole CA farmer innovation process usually needs an ‘impulse’ or an injection of energy (knowledge) to start or to speed-up the momentum and specific awareness or sensitisation events are employed in this function. In this period a couple of CA information days have been organised, namely:

Smallholders:

- Bergville – Emmaus, Ezibomvini, 3 November 2017 (78 farmers); Ndunwana Village, 15 February 2018 (87 farmers); Emmaus, Eqeleni, 15 March 2018 (82 farmers)
- KwaZulu-Natal Midlands – Swayimane, 9 November 2017; Ixopo (26 February 2018);
- Eastern Cape and Southern KwaZulu-Natal - Madzikana (17 December 2017), Springvalley (21 February 2018)

Commercial farmers:

Ottosdal, 13-14 March 2018 (200 participants); Reitz, 19-20 March 2018, (620 participants).

See photos below.



Photos 1a and b: Farmers attending a farmers day at Springvalley, 21 February 2018





Photos 2a to g: Participants and activities at the CA conference, Reitz, 19-20 March 2018



Photos 3a to d: Participants and activities at the CA conference, Ottosdal, 13-14 March 2018

A new awareness initiative funded by The Maize Trust, **the development of a series of CA videos**, has been launched in November 2016, called *“The shepherds of the soil”*. These videos are available on the Grain SA CA website and cover successful CA farmers and practices among commercial and smallholder CA systems. The idea is to widely use these videos to increase the awareness on CA experiences in the country. A second phase of videos have just been completed in cooperation with *no-line* productions with funding from The Maize Trust and the Agricultural Research Council. See photos below.



Photos 4a and b: Video shoots with Cobus van Collier, Viljoenskroon



Photos 5a to d: Video shoots with smallholders and Anthony Muirhead, Winterton, KZN

3.3. Participation in Grain SA Regional and Executive Management Meetings

Dr Smith has attended all the Executive Management Meetings, as well as the Grain SA annual congress at Bothaville on 7, 8 March 2018.

3.4. Grain SA and Argentinian collaboration

The Argentine collaboration has been an important project for Grain SA. A new arrangement to continue the cooperation agreement with Argentina has been developed by both parties during 2014. Final negotiations took place at the NAMPO harvest week in May 2014 and the signing of the new Cooperation Agreement between GSA and Argentina by Jannie de Villiers and the Argentina ambassador, Carlos Sersale di Cerisano, took place on 17 November 2014. The agreement stipulates that existing CA project platforms should be used to implement and demonstrate the Argentina CA system. These platforms are currently all funded by The Maize Trust, i.e. the Ottosdal and Reitz projects. It further stipulates that equipment (especially planters) be borrowed to these projects to allow timely use during planting and harvesting periods. The Pierobon planter was allocated to the Ottosdal and Vrede projects and serviced by Valtrac, while the Apache planter was allocated to the SOK (in Kroonstad) and Vrede projects and serviced by FARMQuip. The results where the Argentina CA system has been compared with local CA systems are described in the annual technical reports attached and have been published in the SA Grain magazine. The two planters were also used to plant various cover crop trials and –fields and were found very useful for that purpose.

During the 2016/2017 planting season, the trials in Ottosdal and Kroonstad were planted successfully. Due to logistical difficulties of transporting the Apache planter to farmers in the Vrede/Ascent study area, these trials were not planted for the 2016/2017 season.

The three year agreement ended in July 2017, which necessitated a revision for possible extension. From 14 to 17 February 2017, an Argentinean delegation visited South Africa to assess the implementation of the agreement at the different sites and with all the stakeholders involved. Further discussions were held at NAMPO in May 2017 and the third cooperation agreement was signed by Argentina parties and Grain SA (Mr. Jaco Minnaar). However, final discussions on the implementation of the trials never happened, since the Argentinian delegation's visit to South Africa never materialized. In the 2017-2018 crop season, there were therefore no formal technical Argentinian involvement in the projects, however, various trials were planted on the Argentinian system. In June 2018 Dr Smith and Mr Stephano Haarhoff, a PhD student (US) working on the Argentinian trials at Ottosdal, were invited and funded by the Argentina government on a study tour to Argentina. The tour was organized and led by CA researchers from INTA and a few articles for SA Grain will give feedback on the lessons learned on this tour.

3.5. Participation in national and international CA initiatives and events

Participation in national CA forums is seen as an important objective to continuously improve the enabling environment for CA to flourish. A number of key issues and initiatives are being addressed by these forums. On 16 April 2018 Dr Smith presented at the SADC LandCare Master Class in Polokwane with the title of his talk "*LandCare experiences and conservation agriculture innovation systems in South Africa*". The following events were also attended by several CA FIP participants: Western Cape CA conference (Houhoek, 7-8 August), KZN No-till Club conference (Drakensville, 4-6 September), National LandCare Conference (Bloemfontein, 25-27 September), the 2nd African CA Conference (Johannesburg, 9-12 October).

3.6. CA Research

The Maize Trust is currently funding a number of CA research projects for the 2017/18 crop season and has requested the CA facilitator at Grain SA to assist with the evaluation and re-alignment of these projects under the CA-FIP philosophy. A panel of national and international CA experts has been established to assist with the evaluation of new CA project proposals and progress/final reports. The panel has successfully assisted The Maize Trust with evaluation of 2017 applications and reports and has also been available to assist the WCT when needed.

Five Maize Trust funded research projects, which is hosted under the banner of the CA-FIP at Grain SA, is currently launching various activities in the different study areas. In the North West Province, a project investigates commercial CA practices under semi-arid, sandy soil conditions, while the focus in the KwaZulu-Natal (Bergville, southern KZN and Midlands) and Eastern Cape (Matatiele) projects is on different approaches and technological options for smallholder farmers in the adoption of CA. Another project has been initiated in the 2015/2016 season to implement CA in two study areas in the North Eastern Free State. The new project has been initiated in cooperation with the Riemland (Reitz) and Ascent (Vrede) study groups and the completion of the first two seasons can be seen as very successful; the third season kicked-off successfully, while the VKB has become a prominent member of the implementing team. The latter move is welcomed, since one of the expected outcomes of the IS approach followed by the CA FIP, is the development of local capacity and ownership (in this case farmer groups and local cooperative) to essentially take over the process as soon as possible. This is an important indicator of sustainability or impact of the project.

These CA-FIP projects advocate the Grain SA / Maize Trust's new strategy on CA and strictly follows an on-farm, farmer-led IS approach, whereby farmers are deeply involved in experiments on their farms, which are properly designed and well supported by researchers, input suppliers and manufacturers. These trials focus on practices such as crop rotations, crop density, cover crops and livestock integration. Various key aspects are investigated, in particular soil health, productivity and profitability, and various stakeholders have been involved to take up these responsibilities. The prime objectives of these projects are to continuously develop and improve CA systems, while empowering farmers and scale out CA to as many other interested farmers as possible. In this process relevant research questions on all aspects on the CA approach and technologies are being posed for continuous improvement and adaptation using appropriate farmer-led IS research methodologies. In smallholder systems, this process is even more complex and critical and much more emphasis is placed on the development of institutional, infrastructure, social and economic components of the system, including the value chain.

The latest results show that significant progress and impact have been made in all these projects, which imply that CA crop production systems (in both commercial and smallholder situations) are being successfully adapted by and scaled-out to participating farmers, as well as farmers exposed to these project activities through awareness events and publications. However, amidst the various serious environmental threats and dire economic situation of many grain farmers, a greater urgency emerged to scale out CA to more farmers much faster. For that purpose much more resources are urgently needed, including manpower, funding and infrastructure. **Separate progress reports for these four projects are attached in Appendix 1 to 5.** These reports are also available on the Grain CA website at <http://www.grainsa.co.za/grain-research/conservation-agriculture>.

4. CONCLUSIONS AND WAY FORWARD

The following conclusions and recommendations for the way forward are made:

- The CA-FIP at Grain SA has successfully designed, implemented and managed various CA Key Strategic Objectives (KSO's) and projects, mostly funded by The Maize Trust and to a lesser extent by the Winter Cereal Trust. The CA FIP has completed its fifth year (season) and significant momentum has already been built into the fourth season.
- The amount of CA related articles published have increased significantly, especially in SA Grain magazine. This is still seen as very relevant and important and will continue. Other relevant stakeholders, such as popular magazines (e.g. *Landbouweekblad* and *Farmers Weekly*) were engaged to accelerate this process. All the articles in SA Grain can be accessed through the Grain SA website.
- Awareness on CA will be continued and accelerated. Any relevant event of quality, such as the annual KZN no-till conference and farmers' days, are opportunities to promote CA, including the role of The Maize Trust / Grain SA. A number of successful awareness events were held in this period, especially the Ottosdal and the Reitz conferences, the latter jointly done with Riemland study group, *Landbouweekblad*, VKB and DeKalb seed. A new awareness initiative, the development of a series of CA videos (*Shepherds of the soil*), has been launched in November 2016. Videos are already available on the website and new videos have been finalised in 2018. Dr Smith is also member of the organising committee of the National LandCare conference (Bloemfontein, 25-27 September) and the 2nd African Conservation Agriculture Conference (Johannesburg, 9-11 October 2018).
- The Argentinian collaboration is an important project for Grain SA. This agreement came to an end in July 2017; its extension has been signed with Argentinian counterparts, but details of trial implementation could not be finalised with Argentinean counterparts for the 2017-2018 season. However, several on-farm trials were established in the various study areas using the Argentinian system and a study tour was funded for two CA FIP participants to Argentina.
- Participation in national CA forums is seen as an important objective to continuously improve the enabling environment for CA to flourish and various forums, conferences and workshops are being supported in this regard.
- The implementation of on-farm, farmer-led research projects among commercial and smallholder farmers are seen as major milestones in the implementation and out-scaling of the CA-FIP. At the moment five projects are implemented at various sites and follow the Innovation Systems approach, having farmers in the centre of the innovation process. At this stage these projects have shown remarkable success, progress and impact.
- Amidst the various serious environmental threats and dire economic situation of many grain farmers, a greater urgency emerged to scale out CA to more farmers much faster. For that purpose, much more resources are urgently needed, including manpower, funding and infrastructure. Various opportunities are continuously being explored in this regard.

5. SUMMARY OF CA FIP EXPENSES BY AUGUST 2018

Summary of budget / expenses - period October 2017 to August 2018

CA FIP Project & Work Package	Total Actual YTD Aug 18	Total Budget YTD Sept18	Available to use
Support Regional CA awareness	158 386	187 000	28 614
National Innovation Platform	13 192	60 000	46 808
Ottosdal - soil	33 109	96 720	63 611
Ottosdal - Cover crops	6 472	173 100	166 628
Ottosdal - Agronomy	78 619	102 600	23 981
Ottosdal - Grain SA	89 771	141 500	51 729
Ottosdal - Farmer facilitator	83 258	107 040	23 782
Smallholders - Bergville (KZN)	660 331	673 810	13 479
Smallholders - Eastern Cape & S-KZN	632 380	649 859	17 479
Riemland, Reitz - Soil	-	83 200	83 200
Ascent, Vrede - Soil	-	76 800	76 800
Riemland + Ascent - Cover crops	7 760	141 600	133 840
Riemland, Reitz - Agronomy	41 120	84 800	43 680
Ascent, Vrede - Agronomy	27 324	53 920	26 596
Riemland, Reitz - Grain SA	38 527	145 000	106 473
Ascent, Vrede - Grain SA	14 224	68 000	53 776
Smallholders - KZN Midlands	555 484	586 247	30 763
Total	2 439 957	3 431 196	991 239