

GRAIN SA
Progress Report by:
CONSERVATION AGRICULTURE
FACILITATOR
Submitted to:
The Maize Trust

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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 (MT) and the Winter Cereal Trust (WCT), 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 MT, with some running costs funding provided by WCT. 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 channelling and managing funding (and projects) for CA over the short, medium and long term. This report will cover the January to December 2018 period of business by the CA Facilitator.

2. LONG TERM OBJECTIVES

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

2.1.1. CA programme conceptualisation

In January 2013 Dr Hendrik Smith was appointed as the CA facilitator. Immediately after the appointment of the CA facilitator (i.e. the period January to September 2013), Dr Smith, supported by Dr Marinda Visser, manager of Grain Research and Policy at Grain SA, developed a comprehensive plan that could serve as a framework for prioritising and channelling MT funding allocated to CA research over the long term, but aiming to have immediate (short) and medium term impacts. 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 research, development and promotion of CA among all grain producers in South Africa. This document covered the following areas: background and conceptual basis and strategy to respond to the problem; design and description of a funding mechanism; identification of an appropriate structure (or process) to develop, manage and/or coordinate the programme. The document was presented and approved by MT and Grain SA as the basis for a long term R&D strategy.

This investigation confirmed that the model for CA research and development (R&D) that evolved during the last few decades (global and local) does not follow a linear process - the actual change and innovation processes are much more complex and diverse. This revelation means that complex, multi-component technologies such as CA require the development of innovation systems (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, discovery and social learning that this generates are key elements; all of which critically place the farmer in the central role.

Following the above statement, the new CA programme established 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 to research, develop and mainstream (promote) 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 new emphasis of the FIP has been to channel, facilitate and coordinate funds to active CA farmers and their groups (including technical and agri-business co-workers), who wish to test, adapt, develop, and adopt innovations on practices, topics and issues focused on CA. The idea is that access to such funding would allow a wide range of CA innovations to be investigated by farmers in their realities, and with proper technical support and facilitation, may expand awareness and innovation capacity among farmers, other rural stakeholders, and those who support them, ultimately facilitating the mainstreaming of CA within the grain industry.

The new CA FIP concept document (Smith and Visser, 2013), submitted and approved by Grain SA / The Maize Trust / Winter Cereal Trust, proposed 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 CA FIP was instrumental to establish the core structure and elements, primarily on behalf of and for the effective application of MT funds. In short, 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:

- A farmers’ day was held in Stulwane, Bergville in association with the KZNDARD and LandCare unit on 16 November 2018. The day was attended by 130 smallholder farmers
- Farmers day: Bergville, Emmaus, Ezibomvini, 12 March 2019 (78 farmers);
- Appelbosch, KZN Midlands, awareness day on 14 November 2018: Attendees: Mrs Sindi Nzimande (Ubuhlebezwe Local Municipality), Seda office (Ubuhlebezwe Municipality) and local CA learning groups from Ngongonini, Plainhill and Emazabekweni (66 participants)



Photos 1a to c: Farmers day in Stulwane, Bergville: Above left: Demonstration of planters, participants of the open day and Smephi Hlatshwayo presenting her research into breeding of traditional maize varieties



Photos 2a and b: Awareness day on 14 November 2018, Appelbosch, KZN Midlands

Commercial farmers:

Reitz CA conference, 11-12 March 2019 (450 participants).

Ottosdal CA conference, 13-14 March 2019 (300 participants)

See photos below.



Photos 3a to d: Participants and activities at the CA conference, Reitz, 11-12 March 2019



Photos 4a and b: Participants and activities at the CA conference, Ottosdal, 13-14 March 2019

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 third phase of videos were completed in 2018/2019 season in cooperation with *no-line* productions with funding from The Maize Trust; the following five videos were completed and are available on *youtube* with links to the Grain SA CA website:

FARMER: COCKY MOKOKA
 AREA: VANDERBIJLPARK
 DATE: 9 APRIL 2019
<https://youtu.be/RneyOVp3dvo>

FARMER: VUYANI LOLWANE
 AREA: LICHTENBURG
 DATE: 15 APRIL 2019
<https://youtu.be/b8DRH2R4BYc>

FARMER: ELVIS MONYE
 AREA: COLIGNY
 DATE: 16 APRIL 2019
<https://youtu.be/VEJbqpAl5MM>

FARMER: BERTIE COETZEE
 AREA: PRIESKA
 DATE: 12-13 JUNE 2019
 Short version: <https://youtu.be/NfpUNPTC3II>
 Full version: <https://youtu.be/-Dk4srcWUL4>

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 6 and 7 March and NAMPO in May 2019.

3.4. Grain SA and Argentinian collaboration

The three year agreement ended in July 2017, which necessitated a revision for possible extension. 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, as well as the 2018-2019 crop seasons, there were therefore no formal technical Argentinian involvement in the projects, however, various trials were planted on the Argentinian system. Another meeting was held at NAMPO in May 2019 and included Argentinian institutions such as INTA, Grain SA and the ARC. A new cooperation agreement will be developed from discussions held in this meeting.

A farmers' day organized by the Argentinian Embassy and with participation of various Argentinian international and local partners and companies was held on 10 September 2019 at the farm of Mr Hendrik Odendaal in Standerton, Mpumalanga. See pictures below.



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. The following events were attended and participated in:

- 15 January 2019 - Dr Smith presented at a CA workshop forming part of the combined crop, soil science and horticulture conference at UFS, Bloemfontein.
- 6 and 7 August – CA conference in Stellenbosch, Western Cape
- 3 to 5 September – KwaZulu-Natal No-till Club conference, Drakensville, Bergville
- 18 September – Grain SA / MT CA forum meeting, Grain SA, Pretoria

3.6. CA Research

The Maize Trust is currently funding a number of CA research projects for the 2018/19 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 2018 applications and reports and has also been available to assist the WCT when needed.

Six MT funded research projects, which are 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 adaptation of CA in these situations. Another project has been initiated in the 2015/2016 season to implement CA in two commercial farming study areas in the North Eastern Free State. These projects are implemented in collaboration with the Riemland (Reitz) and Ascent (Vrede) study groups and the completion of the first three seasons can be seen as successful; the fourth season will kick-off in Octo 2019, with VKB as 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 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 research and develop and adapts CA systems in a range of contexts, by working with and empowering farmers to adapt CA in their own realities. 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 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 participating farmers in their own realities, 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 adapt CA with more farmers much faster. For that purpose much more resources are 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>.

A MT funded project with the title "Determining the carbon footprint intensity of different grain farming systems in the summer rainfall regions" is reported on in a separate document (see **Appendix 6**).

4. CONCLUSIONS AND WAY FORWARD

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

- Feedback and observations during CA FIP outreach and awareness activities show that an enormous interest has been developed among grain producers and other key stakeholders during the last five years. It is becoming clear that we are in the early stages of a genuine agricultural revolution towards a sustainable crop-livestock industry, where it is the innovators and early adopters (farmers, innovative researchers and scientists, journalists, etc.) who are leading the way. The CA FIP has been one of the key initiatives driving and supporting this transformation and will have to be very prominently positioned in the crucial next five years to sustain this momentum.
- 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 current season.
- One of the prime sources of CA information that has increased significantly, is the amount of CA related articles published, 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*, *Farmers Weekly*, *Veeplaas*, etc.) have been very supportive to accelerate this process. All the articles in *SA Grain* can be accessed through the Grain SA website.
- Awareness on CA should 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 Vrede farmers day, as well as the Ottosdal and the Reitz conferences, the latter two jointly done with Ottosdal no-till club and Riemland study group *Landbouweekblad* and VKB. 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 2019. Dr Smith presented at a CA workshop forming part of the combined crop, soil science and horticulture conference on 15 January 2019 at UFS, Bloemfontein.
- 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. Several Argentinian scientists (from INTA) participated in the Reitz and Ottosdal conferences, while a separate farmers day was held on 10 September in Standerton area.
- 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 research projects with commercial and smallholder farmers are seen as key building blocks in the research and development of context-specific CA systems. 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 with significant milestones being achieved.
- Amidst the various serious environmental threats and dire economic situation of many grain farmers, a greater urgency emerged (primarily from producers) to scale out CA to more farmers much faster. For that purpose, more resources are needed, including manpower, funding and infrastructure. Various opportunities are continuously being explored in this regard.

5. SUMMARY OF CA FIP EXPENSES BY AUGUST 2019

Summary of budget / expenses - period October 2018 to August 2019

Description	Total Actual YTD	Total Budget YTD Sept 19	Available to use
Support Regional CA awareness	192 282	213 816	21 534
Support for a national Innovation Platform	28 612	65 000	36 388
Ottosdal - Soil	61 328	98 664	37 336
Ottosdal - Cover crops	96 595	175 264	78 669
Ottosdal - Agronomy	65 514	122 872	57 358
Ottosdal - Grain SA	67 726	155 500	87 774
Ottosdal – Farmer facilitator	111 300	113 346	2 046
Smallholder CA (Bergville, KZN)	636 309	720 971	84 662
Smallholder CA (southern KZN and Eastern Cape)	491 282	695 347	204 065
NE FS, Reitz: Soil	-	83 696	83 696
NE FS, Vrede: Soil	4 502	67 500	62 998
NE FS: Cover crops	140 987	158 144	17 157
NE FS; Reitz: Agronomy	35 054	77 154	42 100
NE FS; Vrede: Agronomy	29 209	33 816	4 607
NE FS; Reitz: Grain SA	62 902	145 000	82 098
NE FS; Vrede: Grain SA	41 038	51 000	9 962
NE FS; Reitz: Dung Beetle Monitoring	48 826	82 280	33 454
NE FS; Vrede: Dung Beetle Monitoring	42 716	84 256	41 540
Smallholder CA (KZN Midlands)	585 193	626 722	41 529
MTCA - Temporary Workers	420 895	642 000	221 105
Total	3 162 271	4 412 348	1 250 077
Plus: Management fee (5%)	158 114	212 067	53 954
Grand Total	3 320 385	4 624 415	1 304 031