DEPARTMENT of AGRICULTURE, FORESTRY and FISHERIES

CROP ESTIMATES

"CONTINUOUS IMPROVEMENT"

Ideas, best practice and innovation

Grain Silo Industry
Mini Symposium

18 August 2014

agriculture,
forestry & fisheries
Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

Crop Estimates Committee
Oesskattingskomitee

CONTENTS

A. HISTORY

1. The Deregulation of the Agricultural Marketing Boards in 1997 and the free play of market prices in SA, necessitated a new approach to crop forecasting.

2. Accurate crop forecasts are essential to keep the market working well.

3. At a meeting of the Maize Forum during 1998, it was requested that a working group being established to deal with crop estimate matters.

B. CROP ESTIMATES LIAISON COMMITTEE (CELC)

Following this request, the CELC was established.

CELC is regarded as the WATCHDOG OVER ACTIVITIES OF CEC

All role-players in the grain industry

(SAFEX, SAGIS, Grain Silo Industry, Chamber of Milling, Processors (AFMA), Traders, Grain SA, Forums)

1. Defining role/Functions of CEC

2. Establishing/Composition of the CEC

3. Do recommendations on:

- **3.1 Current methodologies**
- **3.2 New methodologies**
- **3.3 Research**

4. Evaluate results

1. DEFINING ROLE/FUNCTIONS OF THE CEC

THE OBJECTIVE OF THE CROP ESTIMATES COMMITTEE (CEC):

"*To make available official, reliable, accurate, credible, objective and timely crop estimates*"

1. DEFINING ROLE/FUNCTIONS OF THE CEC …

ACCURACY

- Within 8%: 1st to 4th estimate vs. final crop
- Within 5%: 5th to final estimate vs. final crop

OBJECTIVE

- Members with NO vested interest – not allowed to be involved with trading of grain and oilseeds
- Follow statistical methods – no manipulation

TIMELY

- Reflects estimate as at the middle of a month
- Release time: on day of meeting at 15:30

2. ESTABLISHING/COMPOSITION OF THE CEC

The activities of the CELC were accelerated following:

An unacceptable rise of 12% in the forecast of the CEC for white maize production in July 1999, compared to the June forecast.

Implications were:

- **A shortfall had been predicted for white maize from March to June 1999.**
- **The price on the futures market was therefore held high.**
- **Millers and processors bought maize at a higher price.**
- **Effectively, consumers paid for this through higher food prices.**
- **Export opportunities were lost.**

A new Committee was established in January 2000.

2. COMPOSITION OF THE CEC

No person with an interest in buying and selling of grains is allowed to serve on the Committee!!

- **DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES**
  - **Chairperson and Secretariat**
- **PROVINCIAL DEPARTMENTS OF AGRICULTURE**
  - **9 Representatives**
- **ARC**
  - **ISCW**
  - **SGI**
  - **GCI**

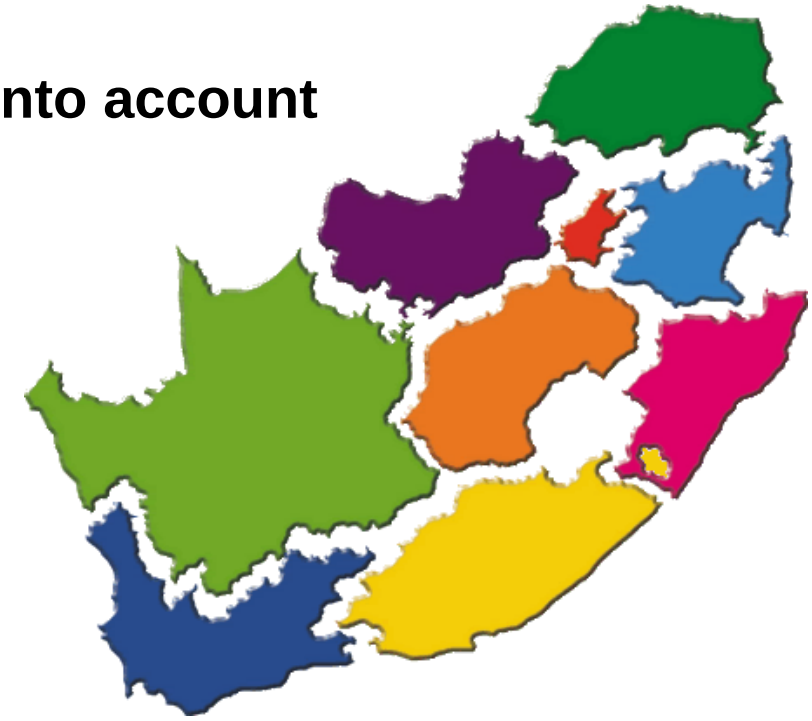
Information is also received from various organisations and institutions which are NOT PART OF THE CEC

3. CURRENT METHODOLOGIES FOR FORECASTING

- ✓**All official RSA crop production forecasts (before harvest) and estimates (after harvest) are based on data obtained from both probability-based and non-probability-based sample surveys of farmers.**

- ✓**Crop farms of all types and sizes are taken into account with the aim of providing statistics at:**

  - ❑ **National and**
  - ❑ **Provincial levels.**



3. CURRENT METHODOLOGIES FOR FORECASTING – DATA INPUT SUPPLIERS

Classified according to type of methodology followed.

	AREA			YIELD			PRODUCTION		
A-line	**NCSC: PICES (obj) & Telephonic survey (subj)**			**NCSC: Obj field surveys & Telephonic survey**			**SAGIS (end of season)**		
B-line	**DAFF**			**ARC-Modelling (needs refinement)**			**SANSOR (discussions needed)**		
C-line	Risk specialists	DPO	Fertiliser Companies	Financial Institutions	Forums	Agric Businesses	PDAs	SACOTA	Traders/ Reports

A-line: Determine the area and production/yield (90%)
B-line: Evaluate/verify inputs from A-line
C-line: Evaluate/verifiy inputs from A- and B-line

A-LINE INPUTS

	AREA	YIELD	PRODUCTION
A-line	NCSC: PICES (obj) & Telephonic survey (subj)	NCSC: Obj field surveys & Telephonic survey	SAGIS (end of season)

Arial Survey: A new earth observation methodology, designed to objectively and accurately determine the area under summer and winter grain crops has been developed in South Africa.

A micro-light aircraft is used to survey selected points throughout the country. The aircraft is equipped with a sophisticated Global Positioning System (GPS) that allows for the easy capturing of field crop data.

Telephonic Survey: Estimates of planted area and area expected to be harvested are derived using data collected via telephone from a sample (probability sample) of farmers shortly after planting has been completed. Farmers have to indicate the area planted for each crop on his/her farm.

A-LINE INPUTS ….

	AREA	YIELD	PRODUCTION
A-line	NCSC: PICES (obj) & Telephonic survey (subj)	NCSC: Obj field surveys & Telephonic survey	SAGIS (end of season)

Telephonic Survey: Estimates of expected yields are derived using data collected via telephone from a sample (probability sample) of farmers during February and March (summer crops) and during August and September (winter crops). Farmers have to indicate the expected yield for each crop on his/her farm.

Objective Yield Surveys: Samples of fields are selected from the fields identified as having the crops of interest during the planted area surveys. In the case of maize, five (5) and for wheat three (3) small plots are randomly located in the selected fields, and counts and measurements of various physiological characteristics are made on the plants in each plot. Done once per season in main provinces.

SAGIS: Reports on actual producer deliveries.

SAGIS South African Grain Information Services NPC
Suid-Afrikaanse Graaninligtingsdiens NWM
Regno. 1997/019195/08

B-LINE INPUTS

	AREA	YIELD	PRODUCTION
B-line	DAFF	ARC-Modelling (needs refinement)	SANSOR (discussions needed)

Postal Survey: Currently, the Crop Estimate Committee relies heavily on the subjective opinion of producers.

Data on the area planted, as well as a farmers' opinion on his expected production is collected from a non-probability sample survey (postal and e-mail survey) to estimate the average yields of summer and winter crops.

Considering current crop and weather conditions, each farmer in the sample reports the "expected production" for each crop on his/her farm.

Yield is a function of the expected production / area planted!!

C-LINE INPUTS

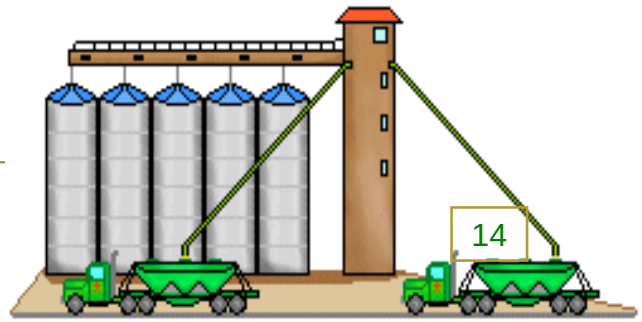
	AREA			YIELD			PRODUCTION		
C-line	Risk-specialists	DPO	Fertiliser Companies	Financial Institutions	Forums	Agric Businesses	PDAs	SACOTA	Traders/ Reports

PDAs assess local conditions and have direct consultations with farmers and farmers study groups.

Own observations regarding weather conditions, crop conditions (phenological stages), crop pests and diseases are also made.

They have a network of contacts from which information is obtained on areas planted and yields. This network may include agricultural businesses, seed companies, producer organisations and large-scale farmers.

Agricultural businesses: A questionnaire is sent monthly to the various companies to update the latest area planted and production statistics.



4. EVALUATE RESULTS

After the production season has been completed, the size of the crop should be finalised at the CELC meeting.

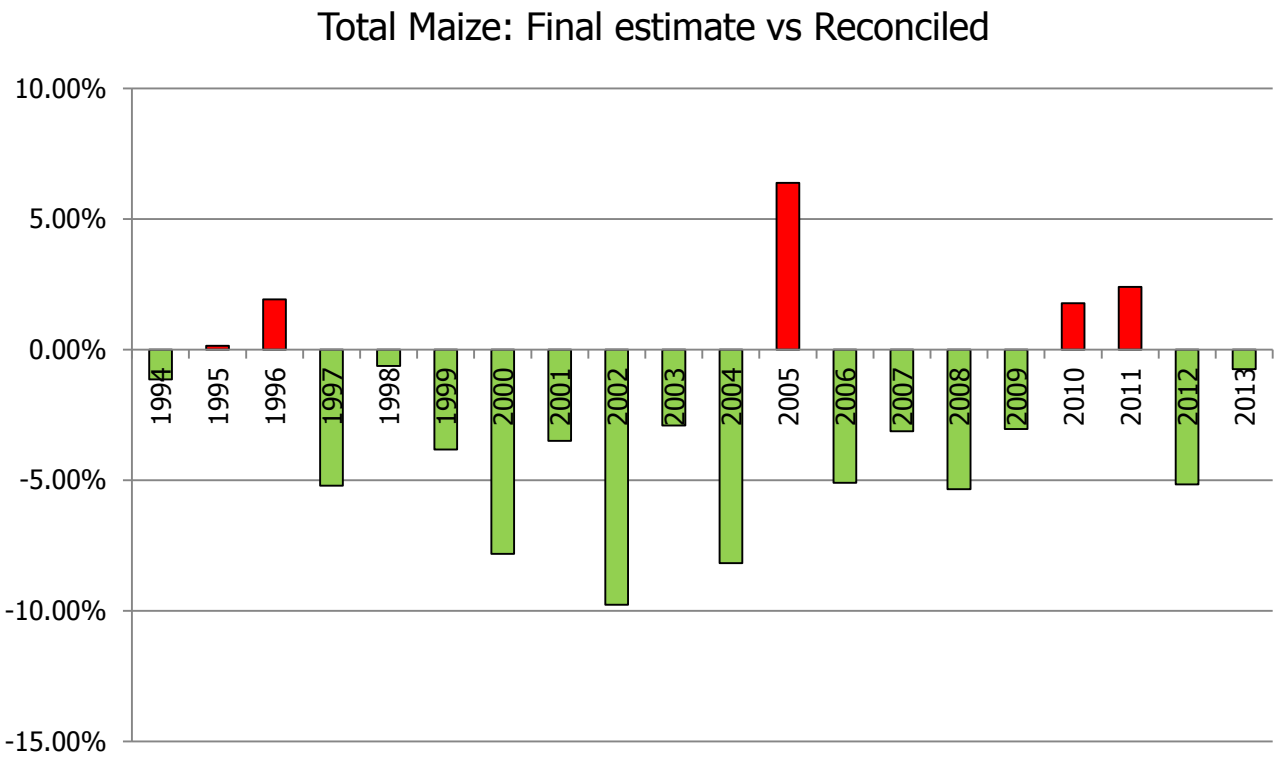
Summer crops: February AND Winter crops: May

FINALISATION CAN BE SUMMARISED AS FOLLOWS:				
TOTAL CROP	=	DELIVERIES	+	RETENTIONS ON FARM
		(SAGIS)		(SURVEYS BY DAFF & NCSC)

If the target is not within 5% of the finalised crop, CELC is to give guidance in trying to improve the crop estimate process.

4. EVALUATE RESULTS …

HOW ACCURATE DOES THE CEC ESTIMATE?



TOTAL MAIZE

5 out 20 year higher

1 out 20 year higher than 5%

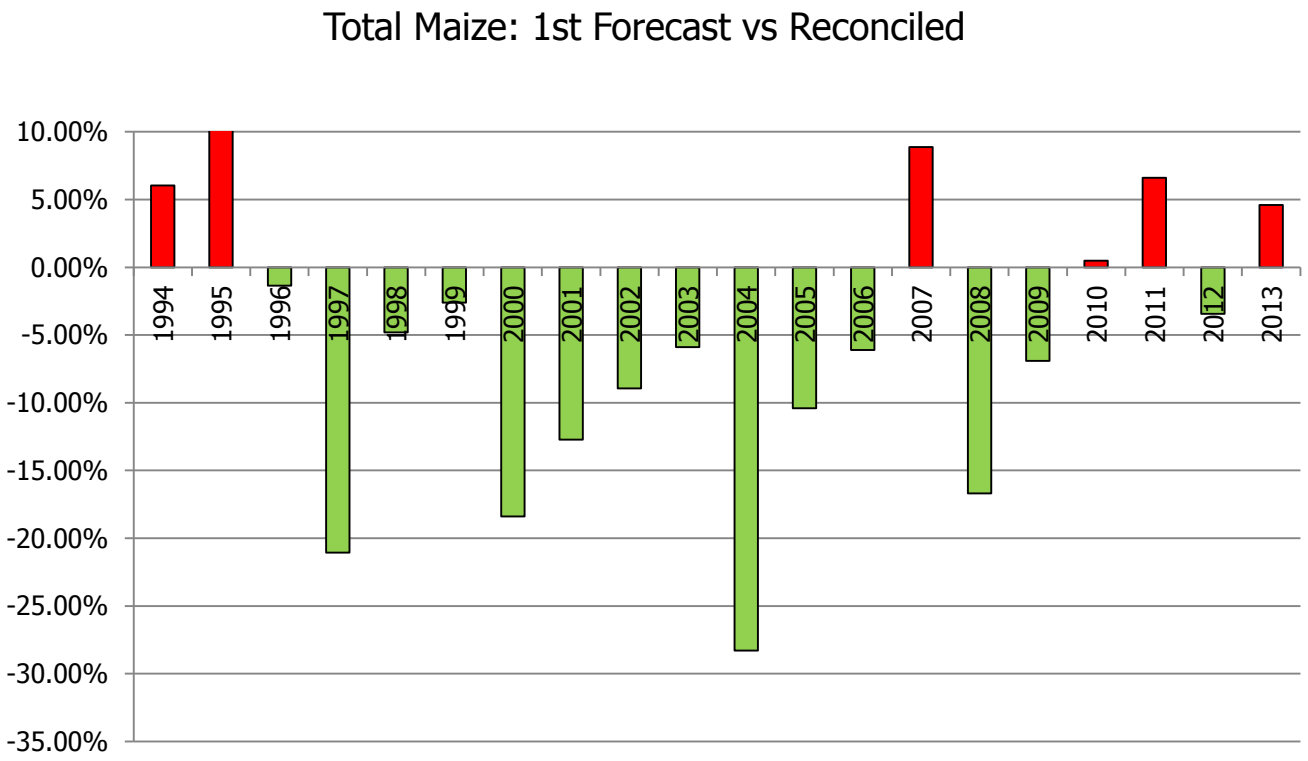
15 out 20 year lower

7 out 20 year lower than 5%

4. EVALUATE RESULTS …

HOW ACCURATE DOES THE CEC ESTIMATE?

TOTAL MAIZE



6 out 20 year higher

4 out 20 year higher than 5%

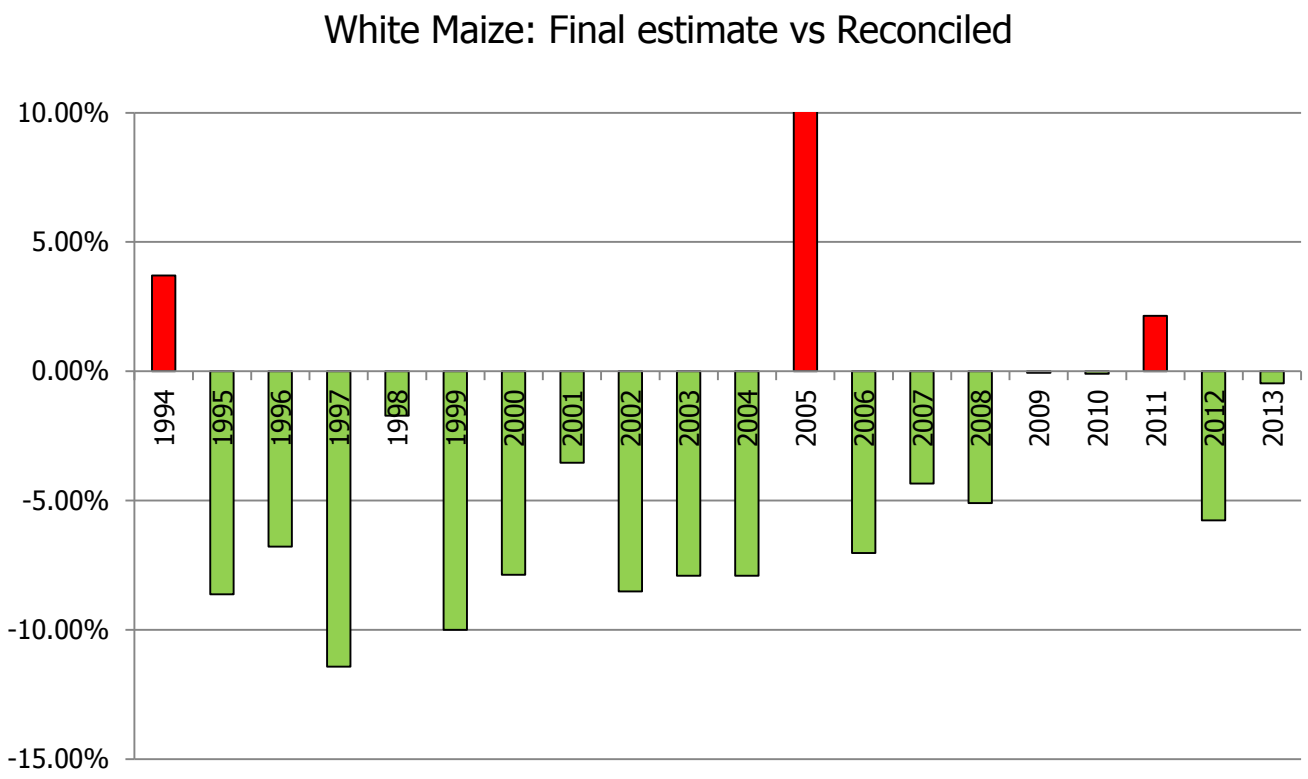
14 out 20 year lower

10 out 20 year lower than 5%

4. EVALUATE RESULTS …

HOW ACCURATE DOES THE CEC ESTIMATE?

WHITE MAIZE



3 out 20 year higher

1 out 20 year higher than 5%

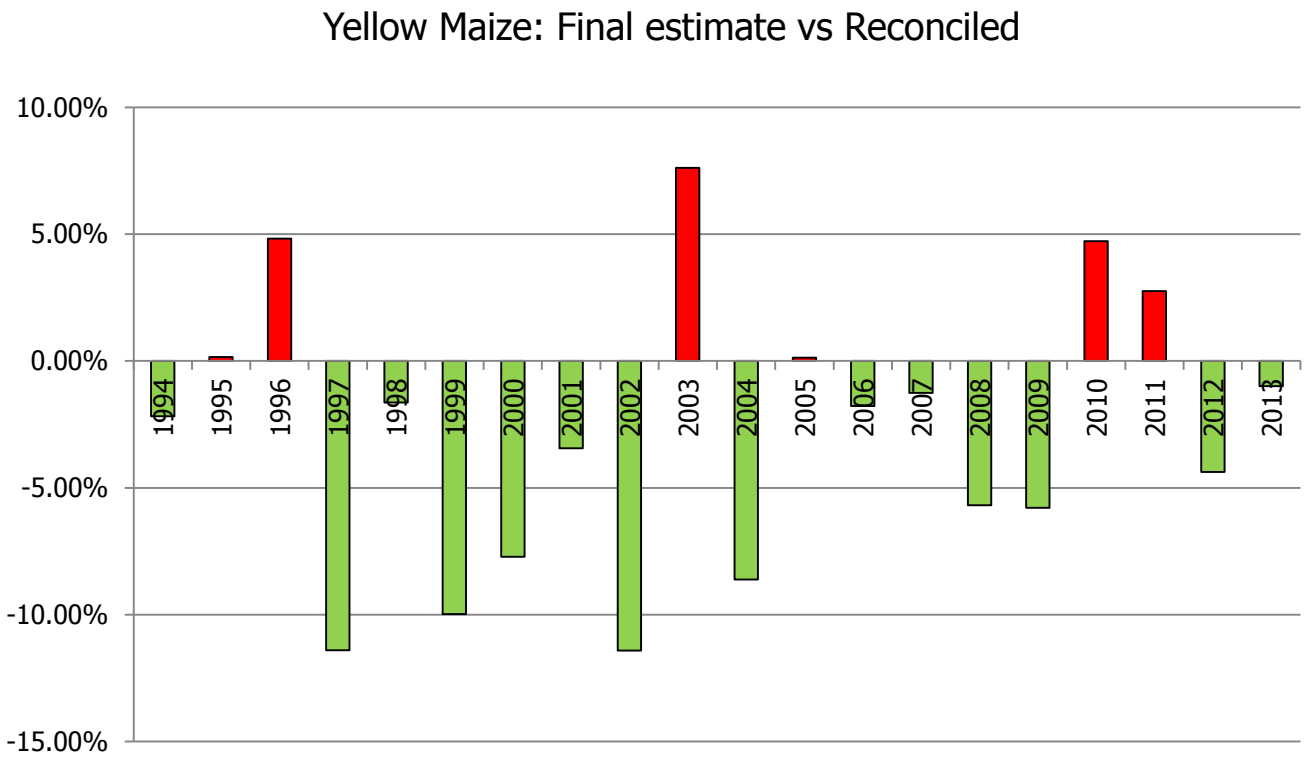
17 out 20 year lower

11 out 20 year lower than 5%

4. EVALUATE RESULTS …

HOW ACCURATE DOES THE CEC ESTIMATE?

YELLOW MAIZE



6 out 20 year higher

1 out 20 year higher than 5%

14 out 20 year lower

7 out 20 year lower than 5%

C. ACTIONS TAKEN TO IMPROVE THE ACCURACY OF CROP ESTIMATES?

✓ **<u>CONSULTANT APPOINTED</u>**

A tender was published in December 2001 for the appointment of a consultant to conduct the development of a system for accurately estimating planted areas and forecasting yields of crops for DAFF.

The contract was awarded to the NCSC (National Crop Statistics Consortium) in March 2002.

The Consortium has developed various systems that are used for crop forecasting, namely:

- Subjective Area Frame;
- Objective Yield System; and
- PICES (Producer Independent Crop Estimates System).

✓ **<u>INTERNATIONAL ASSISTANCE</u> has been received from NASS of the USDA.**

C. ACTIONS TAKEN TO IMPROVE THE ACCURACY OF CROP ESTIMATES?

✓ **DAFF NON-PROBABILITY SAMPLE**

- **Efforts have been made to improve the response rate of the mail survey.**
- **Farmers who do not respond in time are contacted telephonically to obtain the information needed.**

- **DAFF has also set up a list of all the farmers that would rather respond via e-mail or fax and these farmers have been contacted with the preferred medium.**
- **The recruitment of new respondents is also continuously undertaken.**

D. NEW IDEAS TO IMPROVE THE ACCURACY OF CROP ESTIMATES?

✓ **SUBSISTENCE AGRICULTURAL SECTOR**

- **Currently, data is received at the beginning of the production season from the PDAs.**
- **Lack of reliable and accurate data.**
- **This information is critical for Food security management and intervention decisions.**
- **DAFF has requested the Consortium to further develop the existing crop estimates in order to estimate areas planted for summer field crops in the former homeland areas in South Africa (*North West during March 2015*).**

D. NEW IDEAS TO IMPROVE THE ACCURACY OF CROP ESTIMATES? …

✓ **EARLIER YIELD INDICATION**

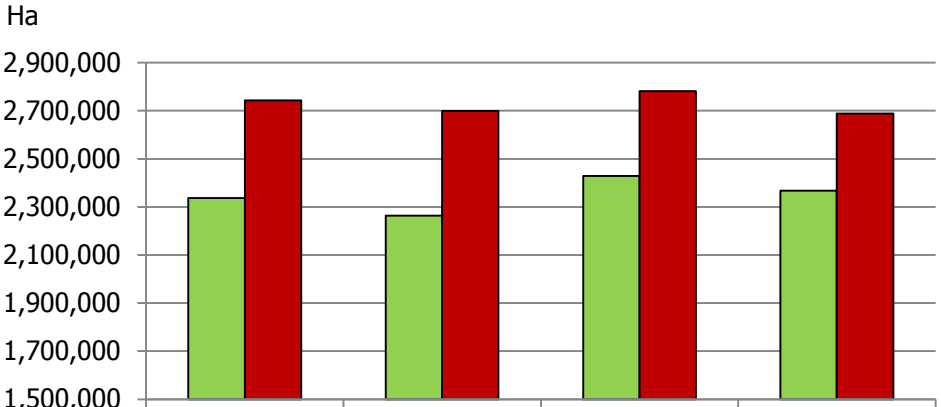
- **The CEC needs an earlier indication of the yields via a combination of satellite vegetation indices, specific crop models and agro-climatic data. (*Needs to form part of research work during 2015/16*)**

✓ **COLLECTION OF DATA FROM FARMERS**

- **DAFF is currently investigating the possibility to collect data from producers through a cell phone application instead of using the traditional form of mailing the questionnaires.**
- **This will also allow to obtain additional information on farmers' crops and harvesting processes within a few days.**

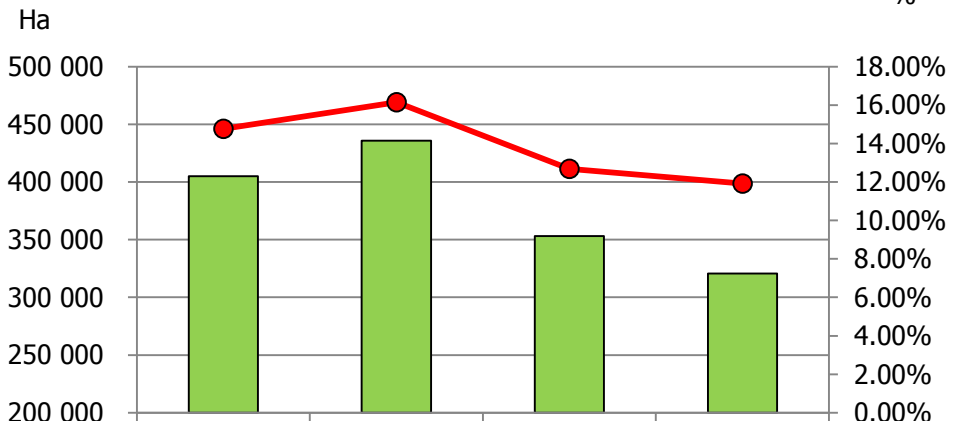
E. INPUTS FROM GRAIN SILO OWNERS

Maize: Area planted - Grain Silo Owners and CEC



	2010	2012	2013	2014
GSO	2,337,329	2,263,213	2,428,150	2,367,592
CEC	2 742 400	2 699 200	2 781 200	2 688 200

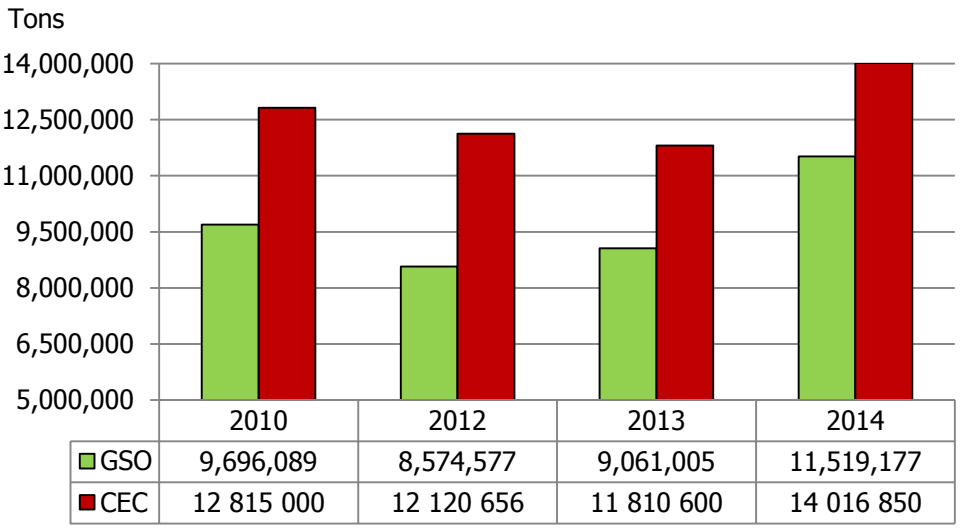
Maize: Area - Grain Silo Owners and CEC



	2010	2012	2013	2014
Diff in Ha	405 071	435 987	353 050	320 608
Diff in %	14.77%	16.15%	12.69%	11.93%

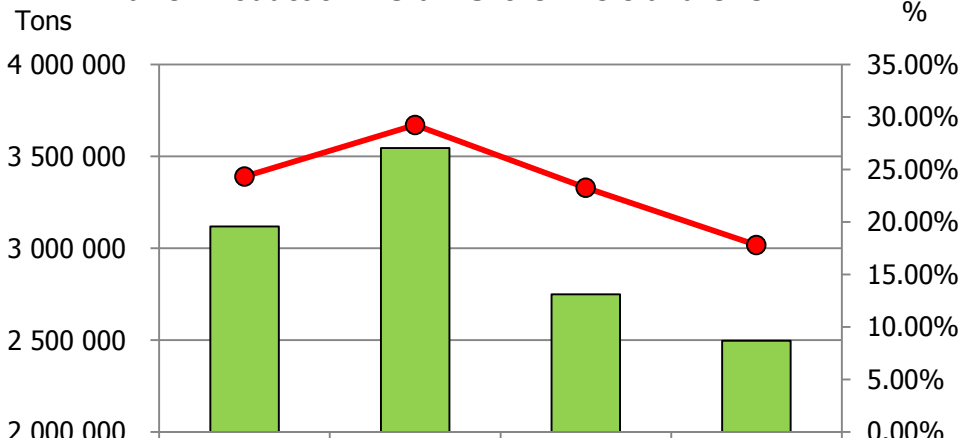
E. INPUTS FROM GRAIN SILO OWNERS

Maize: Production - Grain Silo Owners and CEC



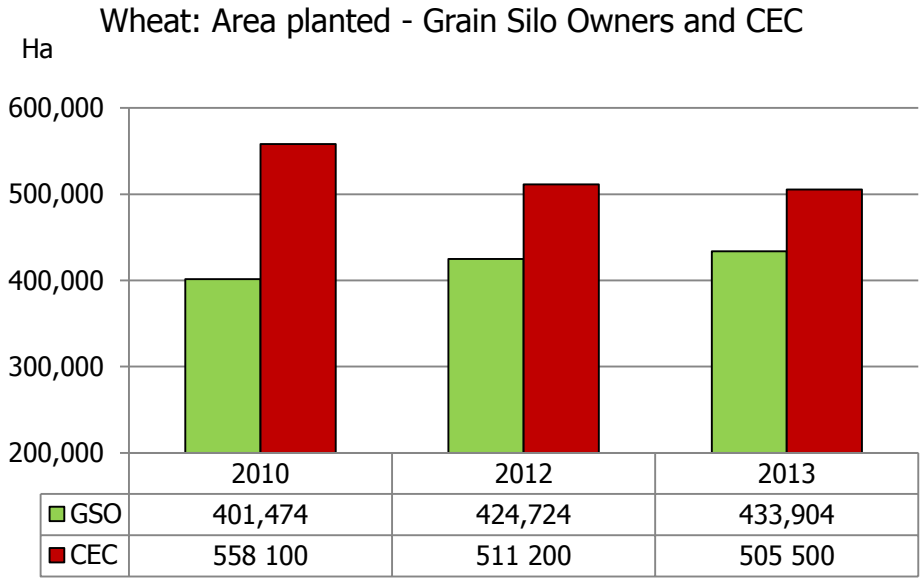
	2010	2012	2013	2014
GSO	9,696,089	8,574,577	9,061,005	11,519,177
CEC	12 815 000	12 120 656	11 810 600	14 016 850

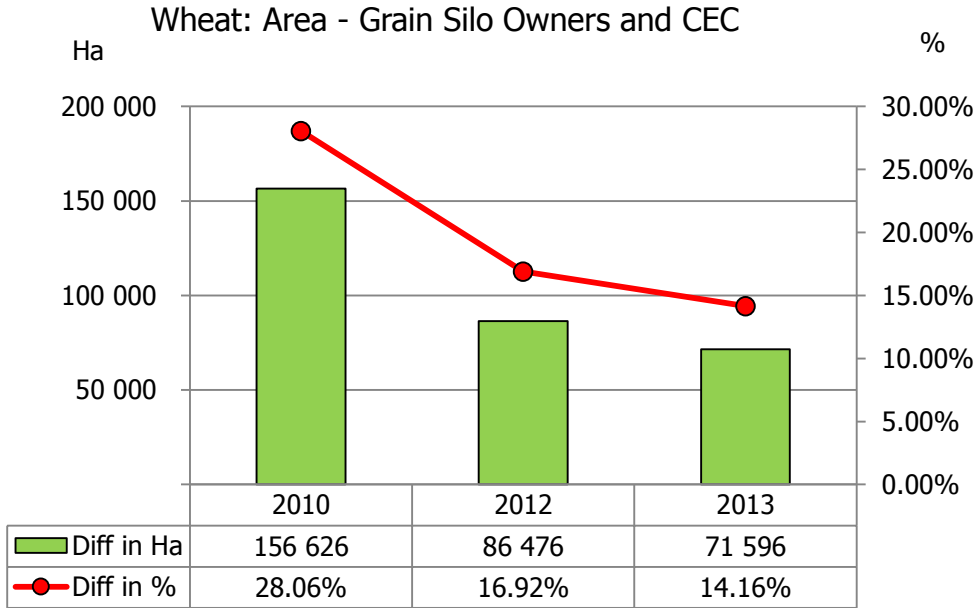
Maize: Production - Grain Silo Owners and CEC



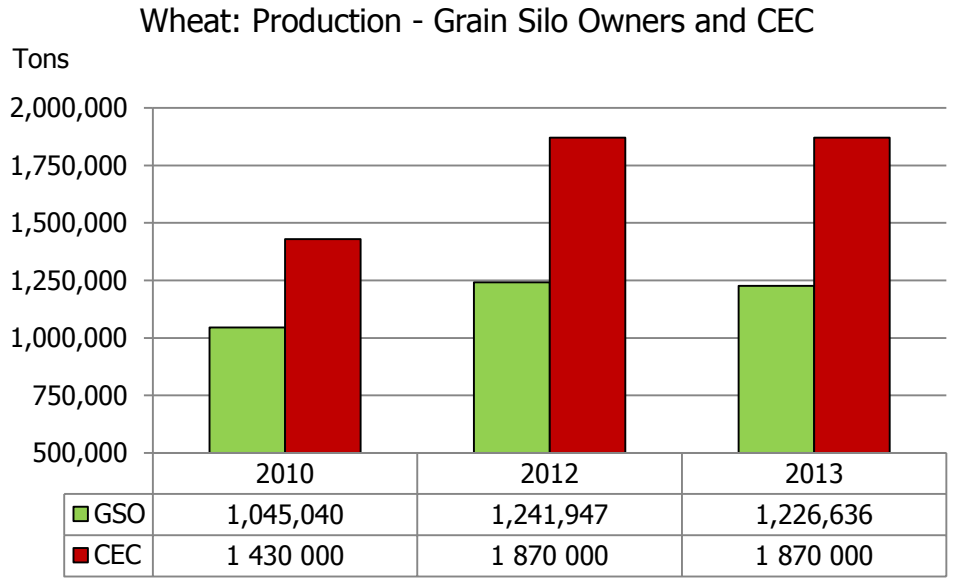
	2010	2012	2013	2014
Diff in Tons	3 118 911	3 546 079	2 749 595	2 497 673
Diff in %	24.34%	29.26%	23.28%	17.82%

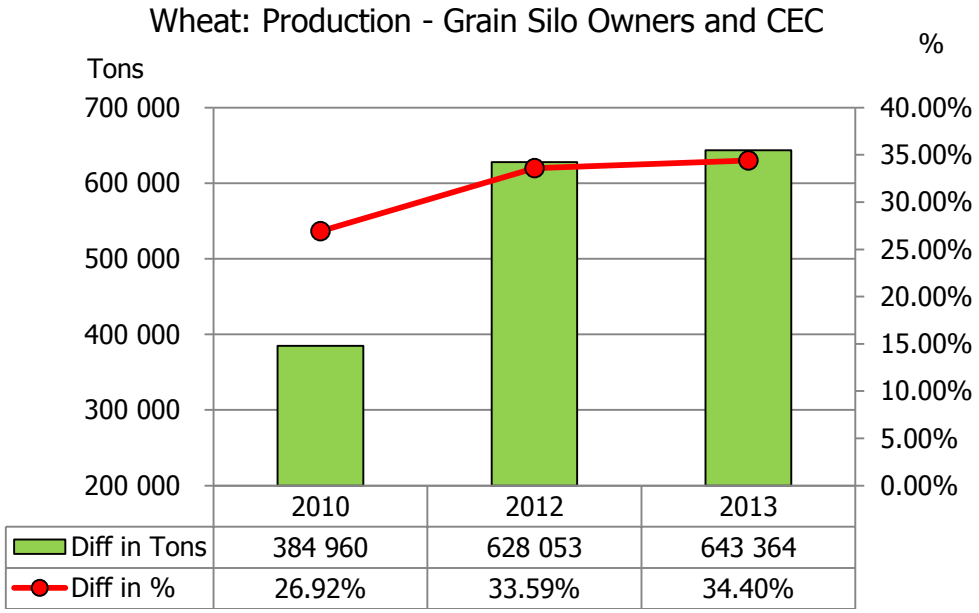
E. INPUTS FROM GRAIN SILO OWNERS





E. INPUTS FROM GRAIN SILO OWNERS





THANKYOU!!