

## Soybean Crop Quality 2015/2016 – Summary of results

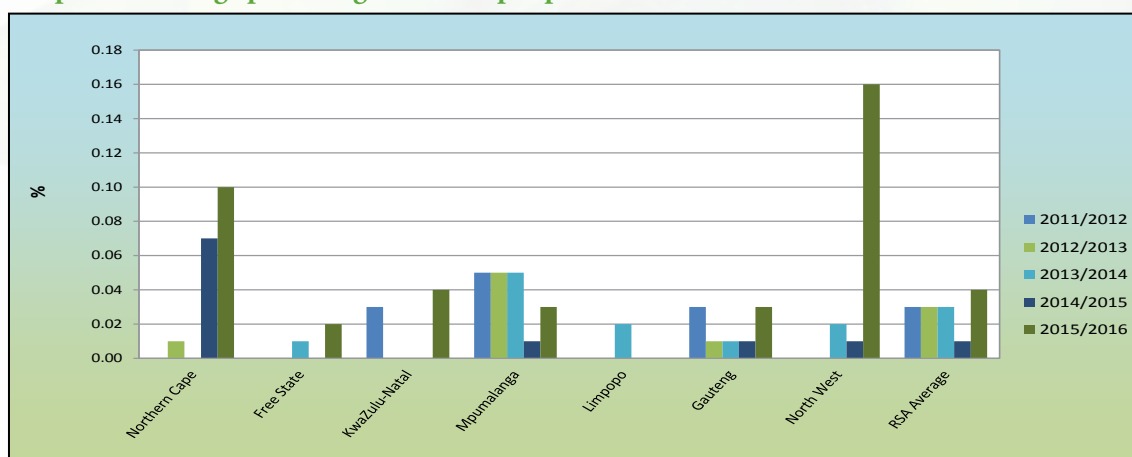
Eighty-nine percent (127) of the 143 samples analysed for the purpose of this survey were graded as Grade SB1 and 16 of the samples were downgraded to COSB (Class Other Soya Beans). During the previous two seasons, 13% (2014/2015) and 12% (2013/2014) of the samples were downgraded to COSB.

- One of the sixteen samples was downgraded as a result of the percentage other grain present in the sample exceeding the maximum permissible deviation of 0.5%.
- One sample was downgraded as a result of the percentage sunflower seed present in the sample exceeding the maximum permissible deviation of 0.1%.
- One sample was downgraded as a result of the percentage stones present in the sample exceeding the maximum permissible deviation of 1%.
- Four of the samples were downgraded as a result of the presence of poisonous seeds (*Datura sp.*) exceeding the maximum permissible number, namely 1 per 1000 g.
- Four samples were downgraded as a result of the presence of poisonous seeds (*Ipomoea purpurea Roth.*) exceeding the maximum permissible number, namely 7 per 1000 g.
- One sample was downgraded for exceeding both maximum permissible number of poisonous seeds (*Datura sp.* and *Ipomoea purpurea Roth.*).
- The remaining four samples were downgraded as a result of a combination of one or more of the following deviations exceeding the maximum permissible deviation: percentage foreign matter, percentage other grain, the presence of an undesired odour as well as poisonous seeds (*Datura sp.*).

According to the South African soybean grading regulations, the determination of the percentage wet pods in a consignment shall be done on a working sample of at least 10 kg of soybeans from a representative sample of the consignment. Due to practical considerations the samples received at the SAGL from the grain storage companies is typically  $\pm 5$  kg. Pods were found in 12 of the 143 samples graded, all of these pods were green, but not wet according to the definition, upon receipt at the SAGL. The percentage of these pods in the samples ranged from 0.05% to 0.50% based on a working sample size of at least 200 g. Only two samples contained pods, not identifiable as wet pods according to the definition, in percentages exceeding the wet pod maximum permissible deviation of 0.2%.

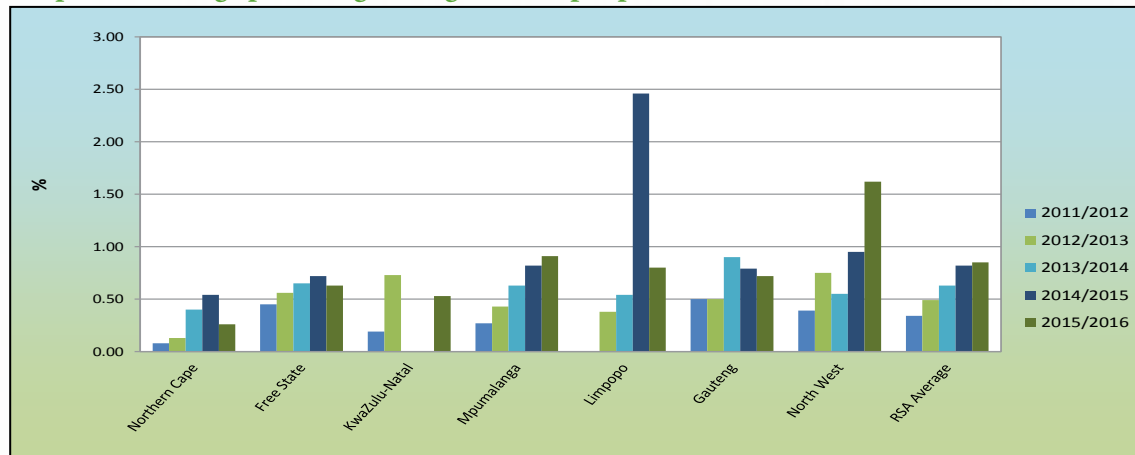
Based on the samples received for this crop survey, *Sclerotinia sclerotiorum* did not pose problems, although the number of samples containing sclerotia increased from 20 in the previous season to 36 this season. The highest percentages of sclerotia observed (0.76% and 0.64%) was on samples from Mpumalanga, followed by a sample from North West with 0.60%. These percentages are however still well below the maximum permissible level of 4%. The national weighted average percentage this season was 0.04% compared to the 0.01% of the previous season. See Graph 16.

**Graph 16: Average percentage sclerotia per province over five seasons**



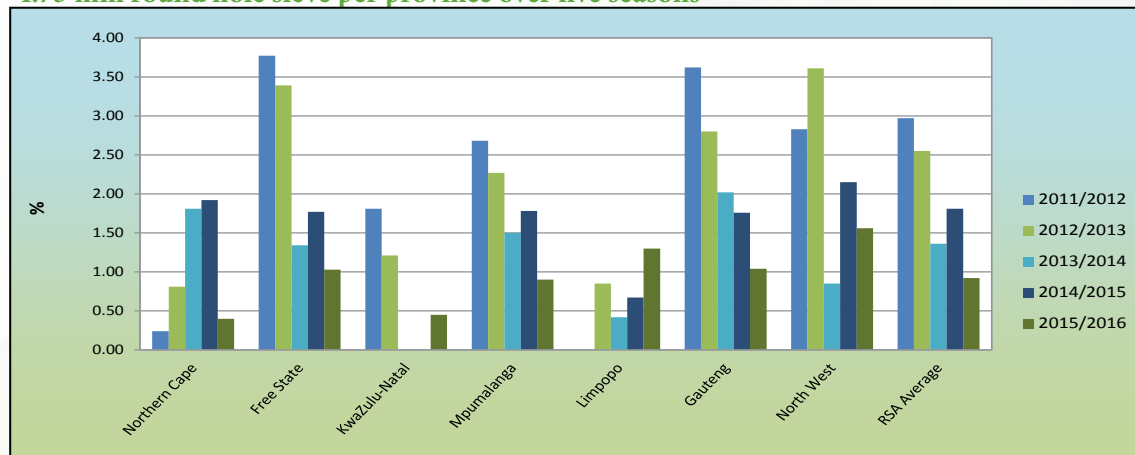
The samples from North West province had the highest weighted average percentage foreign matter (1.62%). The percentage foreign matter in the rest of the samples ranged from 0.26 in the Northern Cape to 0.91 in Mpumalanga. Please refer to Graph 17.

**Graph 17: Average percentage foreign matter per province over five seasons**



North West province (8 samples) reported the highest weighted average percentage soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve, namely 1.56% and the sample from the Northern Cape the lowest at 0.40%. Mpumalanga province with the highest number of samples (91) reported an average of 0.90%. The Free State province averaged 1.03% (23 samples). The national weighted average percentage decreased from 1.81% the previous season to 0.92% this season. Please see Graph 18.

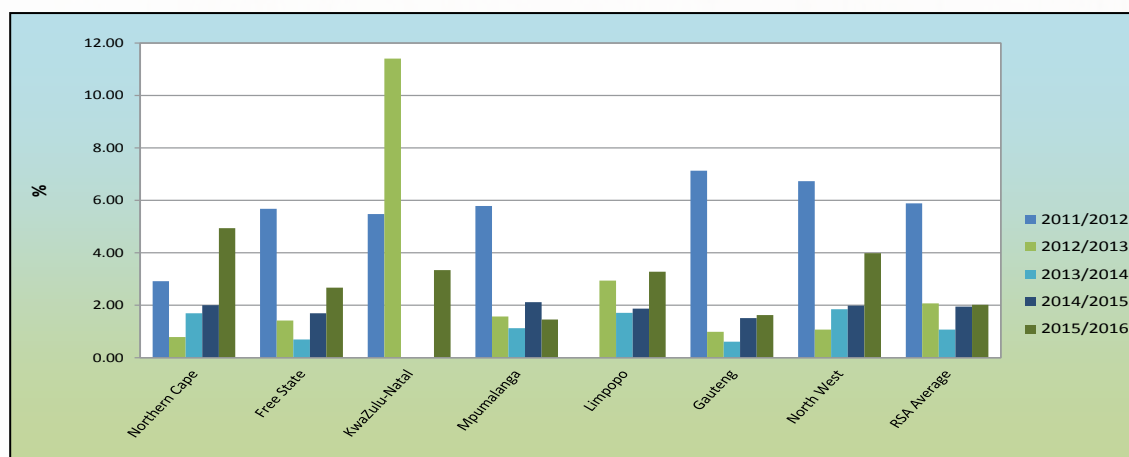
**Graph 18: Average percentage soybeans and parts of soybeans which pass through the 4.75 mm round hole sieve per province over five seasons**



\*Please note that the 2014/2015 and 2015/2016 results represent soybeans and parts of soybeans above the 1.8 mm slotted sieve which pass through the 4.75 mm round hole sieve.

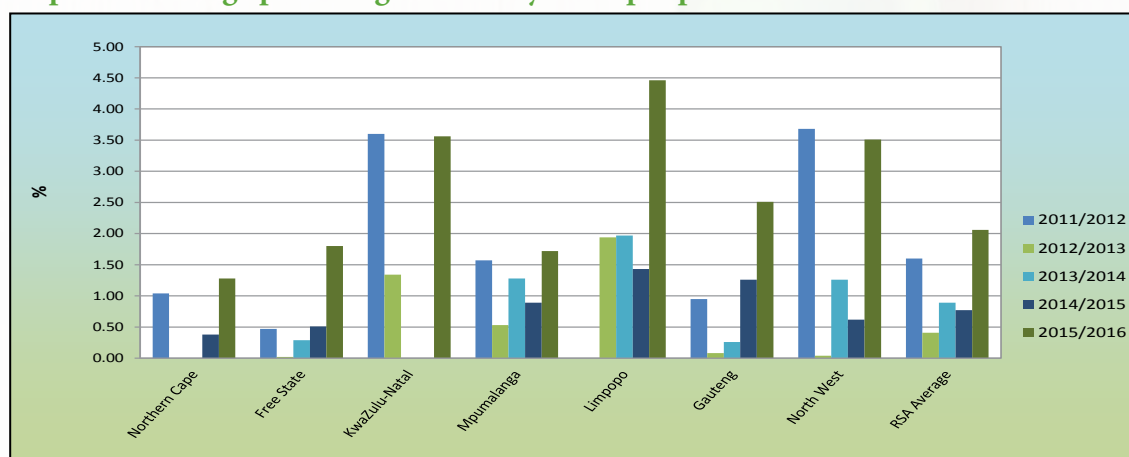
The lowest weighted average percentage defective soybeans on the 4.75 mm sieve were observed on the samples from Mpumalanga, namely 1.46%. The Northern Cape province reported the highest percentage of 4.94, followed by North West and KwaZulu-Natal provinces with 3.99 and 3.34 respectively. The national weighted average increased slightly from 1.95% last season to 2.02% this season. Please see Graph 19.

**Graph 19: Average percentage defective soybeans on the 4.75 mm round hole sieve per province over five seasons**



The RSA weighted average percentage soiled soybeans of 2.06% is the highest since this survey was started in the 2011/2012 season (1.60%). The average last season was 0.77%. Average weighted percentages per province ranged from 1.28 in the Northern Cape to 4.46 in Limpopo. Please see Graph 20. Although the number of samples containing soiled soybeans as well as the average percentage soiled soybeans per sample increased significantly, none of the percentages were above the maximum permissible deviation of 10% according to the grading regulations. Last season, one sample from Mpumalanga exceeded this limit.

**Graph 20: Average percentage soiled soybeans per province over five seasons**

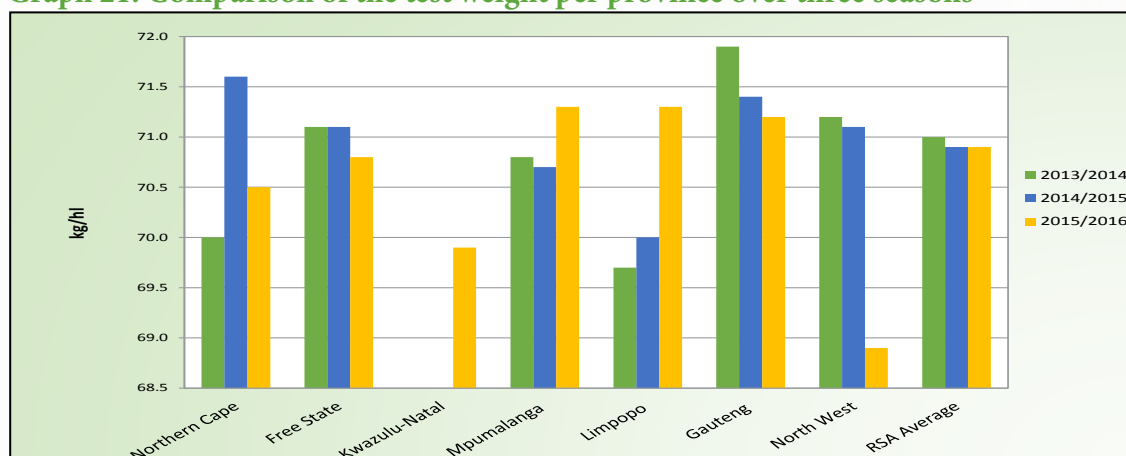


Test weight does not form part of the grading regulations for soybeans in South Africa. An approximation of the test weight of South African soybeans is provided in Table 2 for information purposes. The g/1L filling weight of the 143 soybeans samples was determined by means of the Kern 222 apparatus. The test weight was extrapolated by means of the following formulas obtained from the Test Weight Conversion Chart for Soybean of the Canadian Grain Commission:  $y = 0.1898x + 2.2988$  (291 to 350 g/0.5 L) and  $y = 0.1895x + 2.3964$  (351 to 410 g/0.5 L). Please see also Graph 21 for a comparison of the test weight per province over the last three seasons.

Province	Test weight, kg/hl					
	2015/2016 Season			2014/2015 Season		
	Weighted average	Range	No. of samples	Weighted average	Range	No. of samples
Northern Cape (Regions 10 - 11)	70.5	-	1	71.6	71.2 - 71.9	3
Free State (Regions 21 - 28)	70.8	68.5 - 73.0	23	71.1	67.0 - 72.7	42
KwaZulu-Natal (Regions 36)	69.9	67.7 - 71.6	14	-	-	-
Mpumalanga (Regions 29 - 33)	71.3	68.9 - 72.7	91	70.7	63.3 - 78.2	77
Limpopo (Region 35)	71.3	-	1	70.0	69.3 - 70.8	2
Gauteng (Region 34)	71.2	70.6 - 72.2	5	71.4	69.5 - 72.4	8
North West (Region 12 - 20)	68.9	64.9 - 70.5	8	71.1	68.8 - 72.2	18
<b>RSA</b>	<b>70.9</b>	<b>64.9 - 73.0</b>	<b>143</b>	<b>70.9</b>	<b>63.3 - 78.2</b>	<b>150</b>



**Graph 21: Comparison of the test weight per province over three seasons**



The nutritional component analyses, namely crude protein, - fat, - fibre and ash are reported on a dry/moisture-free basis (db) for the current as well as the previous surveys. For comparison purposes the national 'as is' basis results are provided in Table 3. These 'as is' values were calculated using the weighted national average values.

**Table 3: Comparison of weighted average nutritional component values on a dry and 'as is' basis over four seasons**

Season	2015/2016		2014/2015		2013/2014		2012/2013	
Moisture, % (17hr, 103°C)	7.4		7.0		7.1		7.2	
<b>Moisture basis</b>	<b>Dry basis</b>	<b>As is</b>	<b>Dry basis</b>	<b>As is</b>	<b>Dry basis</b>	<b>As is</b>	<b>Dry basis</b>	<b>As is</b>
Crude protein, %	40.22	37.24	39.89	37.10	39.84	37.01	40.63	37.70
Crude fat, %	19.4	18.0	19.3	17.9	19.7	18.3	18.8	17.4
Crude fibre, %	7.3	7.3	6.4	6.4	6.1	6.1	-	-
Ash, %	4.61	4.27	4.64	4.32	4.66	4.33	4.65	4.32
<i>No. of samples</i>	<i>143</i>		<i>150</i>		<i>150</i>		<i>150</i>	

The weighted average crude protein content this season was 40.22%, slightly higher than the 39.89% and 39.84% of the previous two seasons. The sample from the Northern Cape had the highest weighted average crude protein content of 41.56%, with Gauteng reported the lowest average, namely 38.86%. The weighted average crude fat percentage of 19.4% compared very well with the 19.3% in 2014/2015. The samples from KwaZulu-Natal had the highest weighted average crude fat content of 20.6%. The lowest average fat content was observed in Mpumalanga with 19.1%.

The weighted average percentage crude fibre varied from 6.2% in Limpopo to 7.6% in the Northern Cape. The RSA weighted average was higher this season (7.3%), compared to 6.4% the previous season. A small variation of only 0.05% is observed with regards to the national weighted average ash content over the five seasons that this survey has been conducted. This season, the average ash content was 4.61%. Samples from the Northern Cape and Limpopo tend to show higher ash contents over seasons.

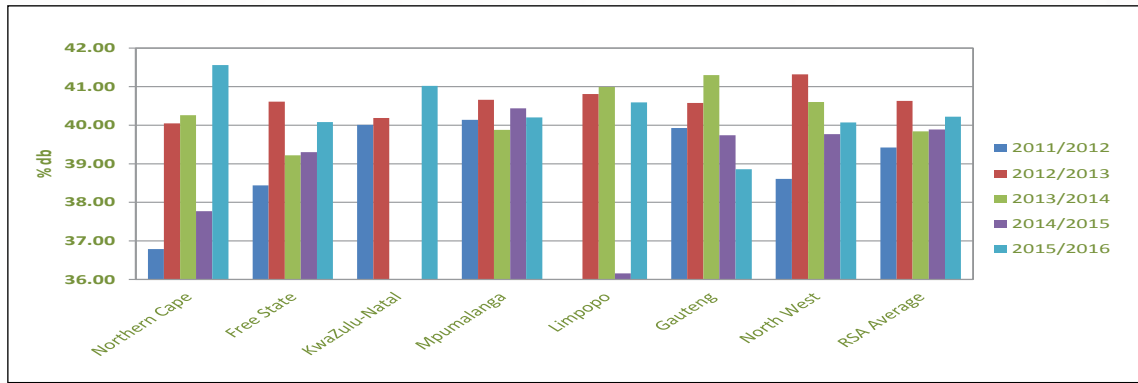
Graphs 22 to 25 on page 15 provide comparisons between provinces over seasons for the nutritional components mentioned above.

A summary of the RSA Soybean Crop Quality averages of the 2015/2016 season compared to those of the 2014/2015 season, is provided in Table 4 on page 16.

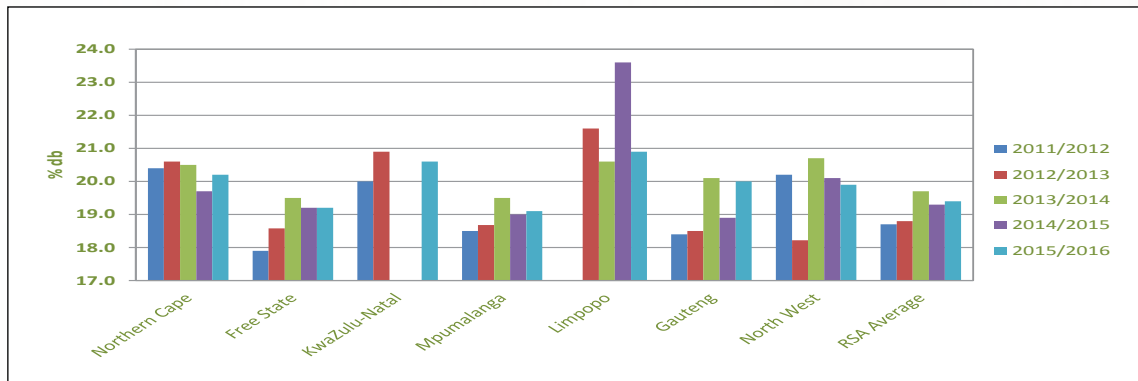
All fifteen samples tested for genetic modification (GM), tested positive for the presence of the CP4 EPSPS trait (Roundup Ready®). Please refer to the results in Table 5 on page 17 of this report.

Please see pages 18 to 25 for the average soybean quality per region.

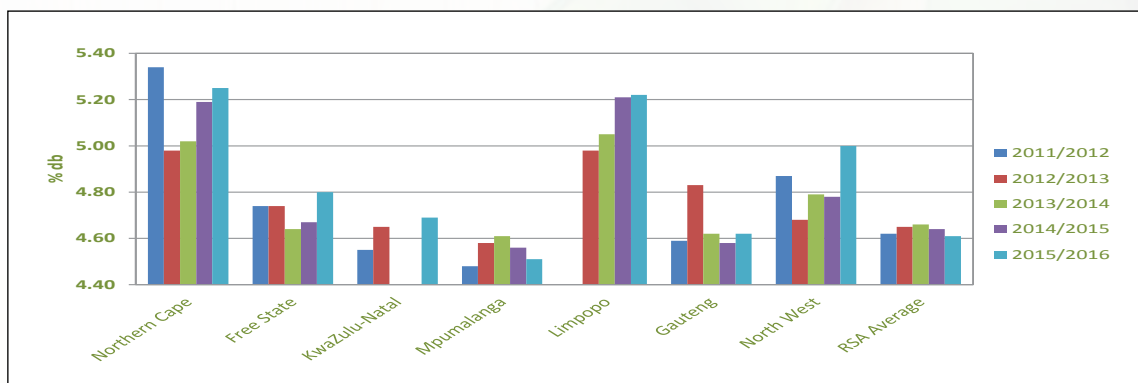
**Graph 22: Average crude protein content per province over five seasons**



**Graph 23: Average crude fat content per province over five seasons**



**Graph 24: Average ash content per province over five seasons**



**Graph 25: Average crude fibre content per province over three seasons**

