



Government of Malawi

DEPARTMENT OF METEOROLOGICAL SERVICES

SECOND ROUND 2008/09 AGRICULTURAL ESTIMATES

## AGROMETEOROLOGICAL UPDATE

Released 8 April 2009

### SEASONAL HIGHLIGHTS

- The Department of Meteorological Services issued the 2008/09 Seasonal Forecast on 19 September 2008.
- At that time, Sea Surface Temperatures over the equatorial Pacific Ocean, which are highly correlated with rainfall over the SADC region including Malawi, were in a neutral state and model projections pointed towards the likelihood of neutral El Nino Southern Oscillation (ENSO) conditions during the 2008/09 rainfall season.
- Based on the models, during 2008/09 rainfall season a greater part of Malawi is expected to experience normal total rainfall amounts. However, just like in any ENSO-neutral season, extreme weather events like floods and prolonged dry spells are expected in prone areas.
- The start of the rainfall season slightly delayed over some parts especially Chikwawa and Nsanje where rains started mid December 2008. Some parts of the north experienced early onset
- Localised dry spells have been experienced over Malawi between end of January and early March 2009...
- Heavy rains caused floods in lower Shire, parts of Zomba and Nkhotakota during end of March 2009...
- Cumulative rainfall performance by 31 March 2009 indicted that less rainfall has been received this season than the same time last season
- Results from Agrometeorological model put national maize production estimate at around 3.2 million MT

All inquiries should be addressed to: The Director of Meteorological Services,  
P.O. Box 1808, Blantyre, MALAWI

Tel: (265) 1 822 014 Fax: (265) 1 822 215 E-mail: [metdept@metmalawi.com](mailto:metdept@metmalawi.com) Homepage: [www.metmalawi.com](http://www.metmalawi.com)

## SECOND ROUND AGROMETEOROLOGICAL UPDATE

### 2008/09 GROWING SEASON PREPAREDNESS

The Department of Meteorological Services issued the 2008/09 Seasonal Forecast on 19 September 2008. At that time, Sea Surface Temperatures over the equatorial Pacific Ocean, which are highly correlated with rainfall over the SADC region, were in a neutral state and model projections pointed towards the likelihood of neutral El Niño Southern Oscillation (ENSO) conditions during the 2008/09 rainfall season. Neutral conditions are usually associated with normal rainfall over a greater part of Southern Africa including Malawi.

**Based on the models, during 2008/09 rainfall season a greater part of Malawi is expected to experience normal total rainfall amounts. However, just like in any ENSO-neutral season, extreme weather events like floods and prolonged dry spells are expected in prone areas.**

### PROGRESS OF 2008/09 GROWING SEASON

#### a. The start of the rainfall season:

The start of the rainfall season slightly delayed over some parts of the country especially in Chikwawa and Nsanje where rains started mid December 2008 which was a delay of about one month. An early onset was experienced in some parts of the north. Effective rains started between end of November and mid December 2008. Good rains continued over most parts of the country mostly due to establishment of the main rainfall systems for Malawi. Heavy rains with hail and strong winds damaged some crops and infrastructure in some parts of the country in December 2008.

#### b. Occurrence of dry spells:

During early January localized dry spells affected some parts of Chitipa, Karonga, Rumphi and Mzimba districts in the north and Salima, Kasungu, and Ntcheu in the centre. However, crops in the affected areas were reported to have survived on residual soil moisture from the rains that were received before the onset of dry spells. The rains temporarily resumed by mid-January before another wave of localized dry spells affected crops in Nsanje and Chikwawa towards the end of January. These dry spells spread to other districts in the south and centre in February and early March. The impacts of dry spells have been worse in lower Shire where some areas have experienced total crop failure.

#### c. Cumulative rainfall performance:

Although the overall the cumulative rainfall amounts received in most parts of the country suggest that less rainfall has been received this season compared to last season, the spatial and temporal rainfall distribution has

been generally better, resulting in a very good crop stand in most parts of the country and another bumper harvest is anticipated. The results from the Malawi Maize Yield assessment model estimate a national maize production of not less than **3,207,806 Metric Tonnes** during the 2008/09 growing season. More details are on Tables 1 and 2 at the end of this document. Please note that these figures should be treated as un official estimates The official crop production estimates come from Ministry of Agriculture and Food Security

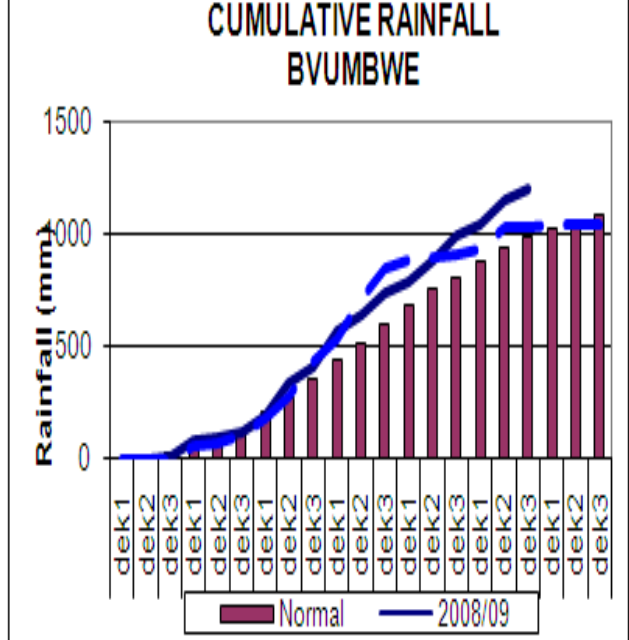
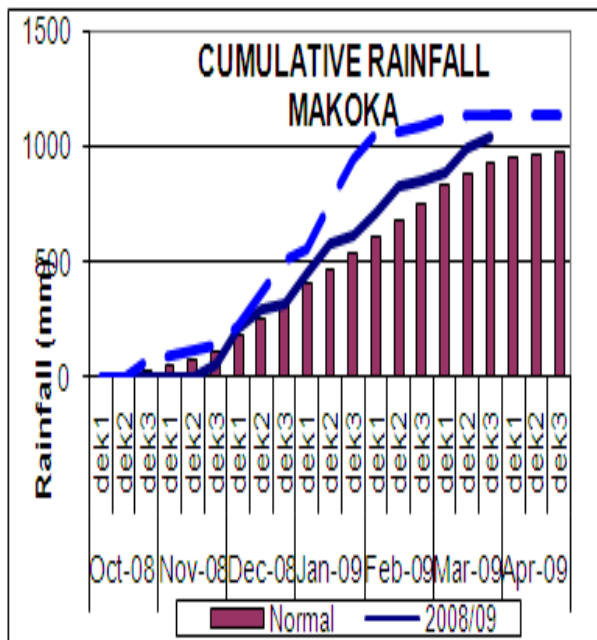
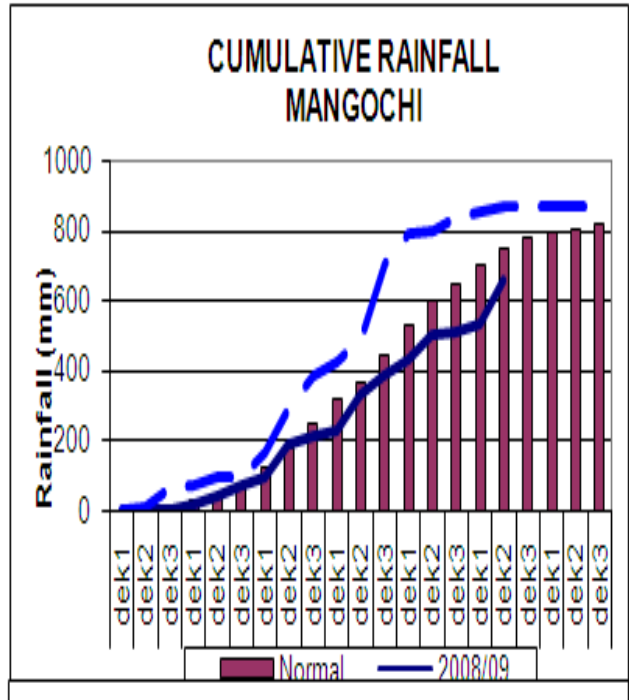
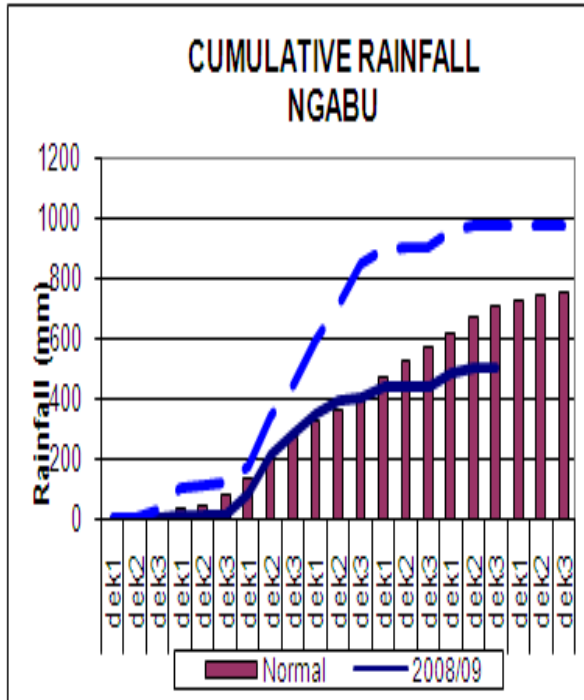
Cumulative rainfall performance from October 2008 to 31 March 2009 indicated that a greater part of Malawi has received average rainfall amounts with few areas registering below and above average rainfall.

### **OUTLOOK FOR APRIL TO JUNE 2009**

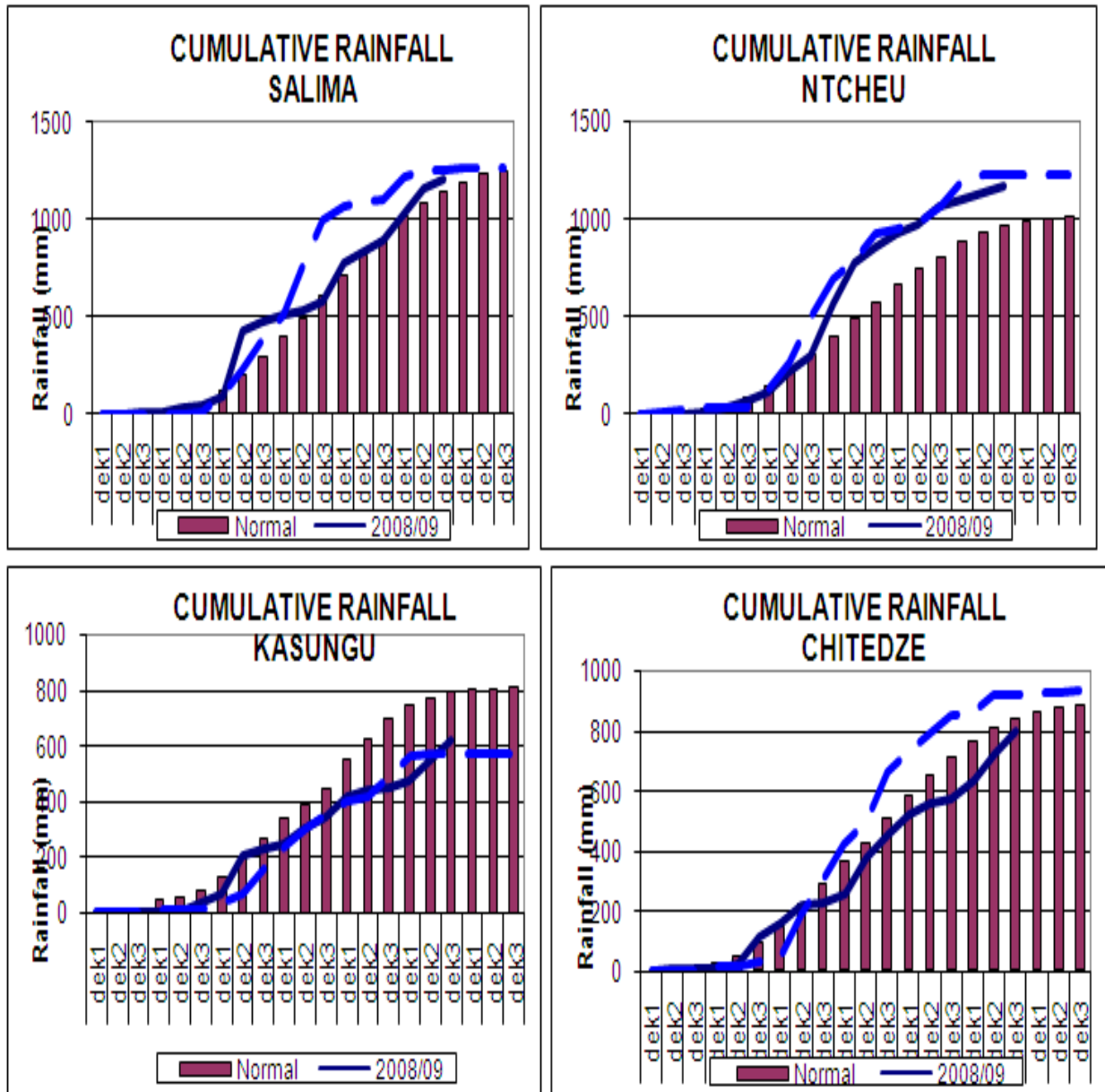
Climate prediction models indicate a continuation of the weak La Nina to ENSO neutral conditions in the next couple of months. The models continue to suggest that the greater part of Malawi should expect normal rainfall amounts during the period. Normally the main rainfall season in Malawi ends between April and early May and thereafter the country experiences generally light rainfall due to incursions of cool and moist southeasterly winds. Such rains normally favour highlands and lakeshore areas..

The graphs for cumulative rainfall indicated that generally less rainfall has been received this season compared to the same time last season and a normal season. Details are in Figures 1a- 1c below.

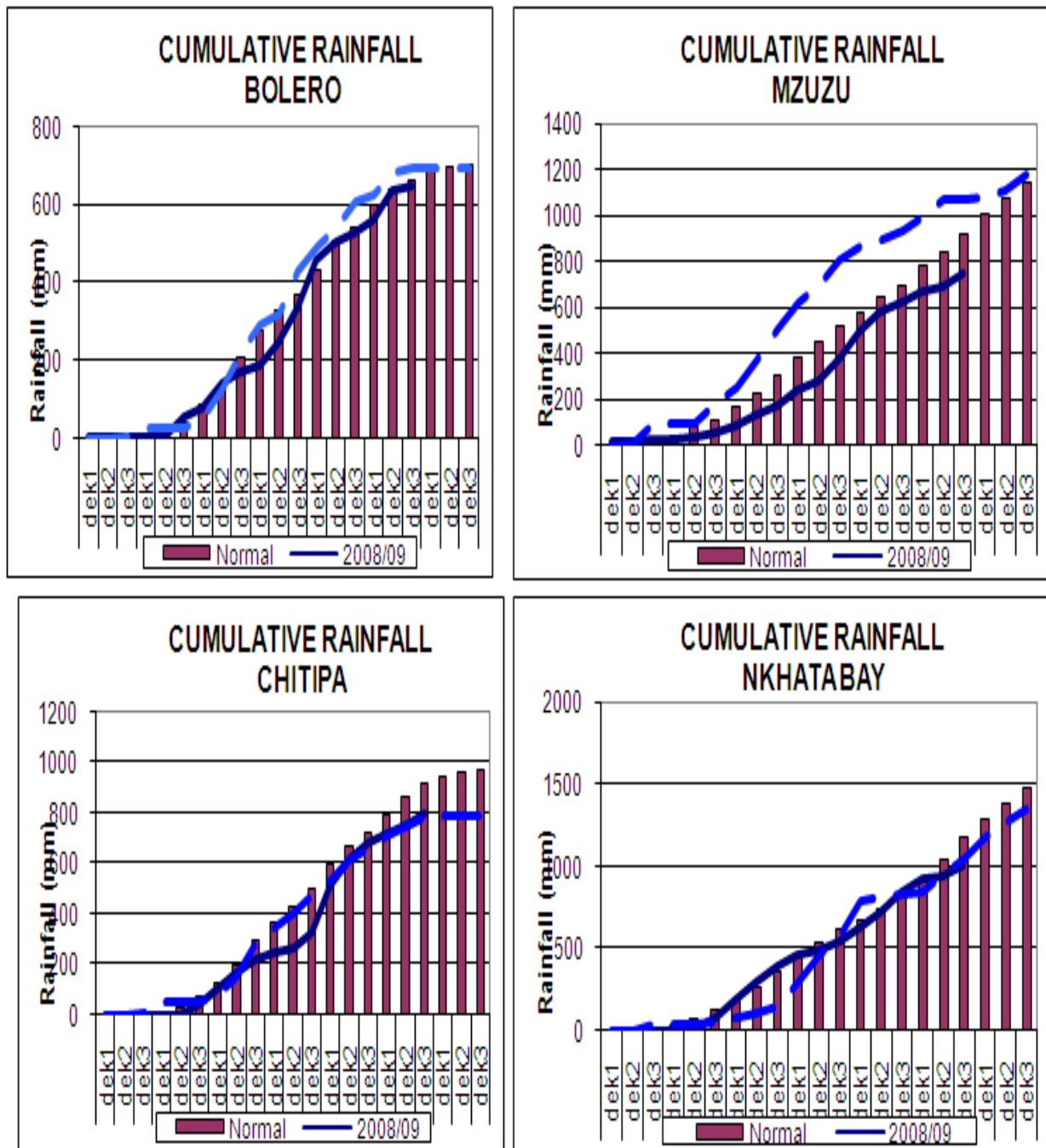
**Fig; 1a: Cumulative Rainfall graphs - south**



**Fig: 1b: Cumulative Rainfall graphs - centre**



**Fig; 1c: Cumulative Rainfall graphs - north**

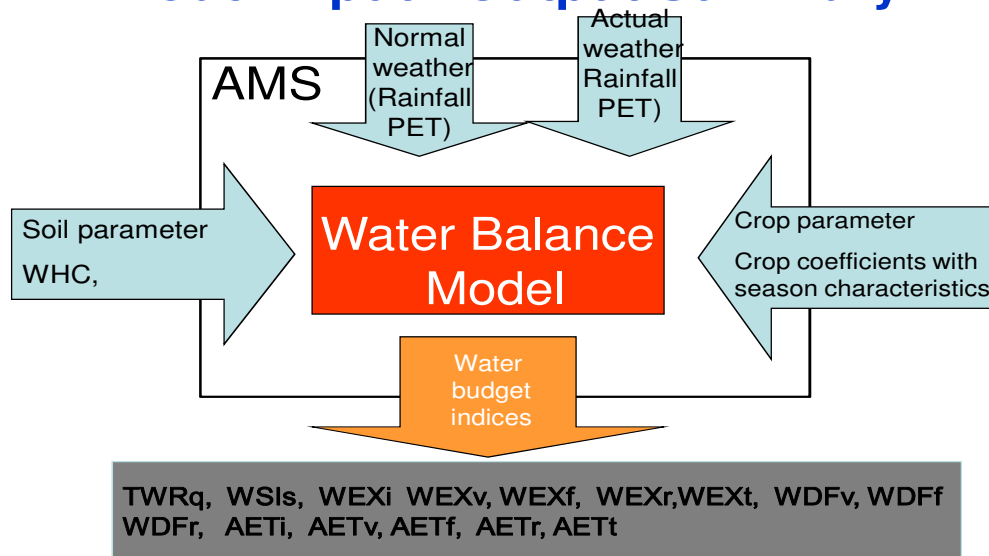


## 2008/09 RESULTS FROM MAIZE YIELD ASSESSMENT MODEL

### Model Main Objectives

- Monitoring Crop conditions with the aim of predicting yields (tons/ha) and production long before the harvesting actually takes place
- Support early warning systems for food security, management of Natural Resources, Disasters, weather and climate Risks

### Model Input - Output Summary



### Yield Prediction & Production

#### Yield Prediction

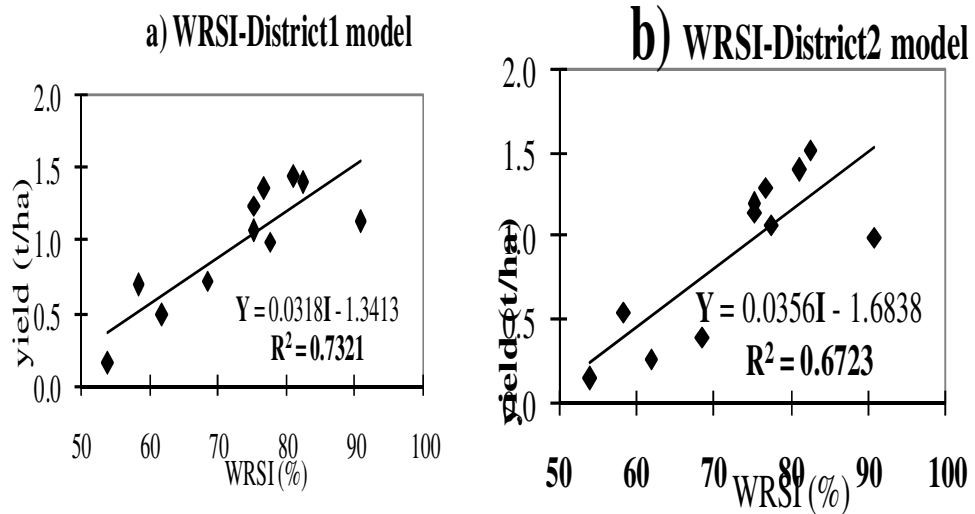
$$Y = a + b (WRSI)$$

Where; a = intercept constant

b = coefficient of the relationship  
 btm hist. yields and WRSI

WRSI = Water Requirement  
 Satisfaction Index

## DISTRICT REGRESSION MODELS



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## Production

### Production Forecasting

$$P = Y \times A,$$

where; Y = predicted yield  
A = Area planted to that specific crop (maize)

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**2008/09 MAIZE YIELD ASSESSMENT BASED ON THE FAO CROP SPECIFIC WATER  
BALANCE MODEL**

**LOCAL MAIZE – SEASON 2008–2009**

ADD	Area Pl.	WRSI	a	b	S.E.
SHIRE VALLEY	33443	88	-65.01	1.679	14.289
BLANTYRE	157754	90	-68.00	1.663	13.821
MACHINGA	224197	91	-86.13	1.978	15.190
SALIMA	36522	93	-128.30	2.444	13.652
LILONGWE	283040	93	-114.41	2.275	10.452
KASUNGU	209757	92	-80.44	1.909	11.668
MZUZU	97822	94	-85.82	1.980	10.945
KARONGA	15027	93	-140.85	2.583	13.004
NATIONAL	1057562	92	-86.17	1.954	12.980

DISTRICT	EST. YIELD (% Max.)	EST. YIELD (kg/ha)	EST. PROD. (Tonnes)	YIELD LOW	YIELD HIGH
Balaka	93	1319	54759	949	1688
Blantyre	81	1411	36262	1000	1821
Chikwawa	83	1158	28564	806	1509
Chiradzulu	81	1082	19732	768	1397
Chitipa	100	2619	22484	2002	3236
Dedza	96	1470	142049	1200	1739
Dowa	95	1750	89428	1384	2115
Karonga	100	1563	10066	1195	1931
Kasungu	95	2186	146988	1730	2643
Likoma	101	1751	7	1426	2077
Lilongwe	96	1949	195786	1592	2306
Machinga	93	1614	63859	1162	2066
Mangochi	93	1437	124273	1034	1839
Mchinji	95	1924	124749	1522	2325
Mulanje	81	1372	45306	973	1771
Mwanza	81	1263	14186	895	1630
Mzimba	101	2120	172486	1726	2514
Neno	81	1260	23033	894	1627
NkhataBay	101	1941	15134	1580	2302
Nkhotakota	99	1929	25389	1470	2388
Nsanje	83	1165	10217	812	1519
Ntcheu	96	1587	136428	1296	1879
Ntchisi	95	1870	49653	1479	2260
Phalombe	81	1522	43349	1080	1965
Rumphi	101	2332	20217	1898	2765
Salima	99	1757	41038	1339	2175
Thyolo	81	1369	31221	971	1767
Zomba	93	1400	79236	1007	1792

**HYBRID MAIZE – SEASON 2008–2009**

<b>Area</b>					
<b>ADD</b>	<b>Pl.</b>	<b>WRSI</b>	<b>a</b>	<b>b</b>	<b>S.E.</b>
SHIRE VALLEY	7973	89	-57.68	1.645	21.652
BLANTYRE	91502	91	-75.95	1.803	12.578
MACHINGA	62379	93	-78.96	1.846	18.501
SALIMA	21863	95	-172.75	2.776	11.675
LILONGWE	101049	95	-107.08	2.065	7.960
KASUNGU	119704	93	-48.17	1.474	14.710
MZUZU	55982	97	-125.30	2.304	7.196
KARONGA	16308	95	-215.92	3.103	27.657
NATIONAL	476760	94	-76.262	1.763	14.768
	<b>EST. YIELD (%)</b>	<b>EST. YIELD (kg/ha)</b>	<b>EST. PROD. (Tonnes)</b>	<b>YIELD LOW</b>	<b>YIELD HIGH</b>
<b>RDP</b>	<b>Max.)</b>				
Balaka	93	3095	38192	2033	4157
Blantyre	89	2821	45103	2129	3513
Chikwawa	88	2111	9206	1068	3153
Chiradzulu	89	2390	21181	1803	2976
Chitipa	79	2949	24134	867	5030
Dedza	89	2927	67864	2483	3370
Dowa	89	3206	84796	2289	4123
Karonga	79	2219	18026	653	3786
Kasungu	89	2994	143137	2137	3850
Likoma	97	3400	364	2961	3840
Lilongwe	89	2791	159697	2368	3214
Machinga	93	4354	36158	2859	5848
Mangochi	93	2819	35697	1851	3787
Mchinji	89	3141	96170	2243	4040
Mulanje	89	2660	56421	2008	3312
Mwanza	89	2481	16786	1872	3089
Mzimba	97	3617	155567	3149	4085
Neno	89	2699	11098	2037	3361
NkhataBay	97	3400	24078	2961	3840
Nkhotakota	90	2918	26460	2257	3579
Nsanje	88	2014	7274	1019	3009
Ntcheu	89	2860	59035	2427	3293
Ntchisi	89	3427	50809	2446	4407
Phalombe	89	2565	25859	1936	3194
Rumphi	97	4171	24124	3631	4710
Salima	90	3400	43503	2630	4170
Thyolo	89	2390	58501	1803	2976
Zomba	93	3720	108141	2443	4997

TABLE 1: 2008/09 SECOND ROUND LOCAL &amp; COMPOSITE MAIZE PRODUCTION ESTIMATES

<b>CROP: Local &amp; Composite Maize</b>						
<b>YIELD: kg/ha WRSI: % AREA: Hectares PRODUCTION: Tonnes</b>						
<b>AREA BASED ON 2008/09 SECOND ROUND AGRICULTURE PRODUCTION ESTIMATES</b>						
<b>ADD</b>	<b>08/09 WRSI</b>	<b>08/09 YIELD</b>	<b>YIELD LOW</b>	<b>YIELD HIGH</b>	<b>08/09 AREA</b>	<b>08/09 PRODUCTION</b>
SHIRE VALLEY	88	1160	808	1511	33443	38782
BLANTYRE	90	1351	958	1744	157754	213087
MACHINGA	91	1437	1034	1839	224197	322127
SALIMA	93	1819	1386	2252	36522	66426
LILONGWE	93	1676	1368	1983	283040	474263
KASUNGU	92	1959	1549	2368	209757	410818
MZUZU	94	2125	1730	2520	97822	207844
KARONGA	93	2166	1656	2676	15027	32550
NATIONAL	92	1670	1293	2047	1057562	1,765,897

TABLE 2: 2008/09 SECOND ROUND HYBRID MAIZE PRODUCTION ESTIMATES

<b>ADD</b>	<b>08/09 WRSI</b>	<b>08/09 YIELD</b>	<b>YIELD LOW</b>	<b>YIELD HIGH</b>	<b>08/09 AREA</b>	<b>08/09 PRODUCTION</b>
SHIRE VALLEY	89	2067	1046	3088	7973	16480
BLANTYRE	91	2568	1938	3197	91502	234950
MACHINGA	93	3498	2297	4698	62379	218187
SALIMA	95	3200	2475	3925	21863	69963
LILONGWE	95	2836	2407	3266	101049	286596
KASUNGU	93	3132	2236	4028	119704	374912
MZUZU	97	3646	3175	4118	55982	204132
KARONGA	95	2585	760	4410	16308	42160
NATIONAL	94	3036	2274	3798	476760	1,447,380

Making a total of Maize production of 3,207,806 MT