



# agriculture, forestry & fisheries

Department:  
Agriculture, Forestry and Fisheries  
REPUBLIC OF SOUTH AFRICA

## National Agro-meteorological Committee (NAC) Advisory on the 2015/16 summer season Statement from Climate Change and Disaster Management 04 DAFF 2015

21 December 2015

In the light of the seasonal outlook as produced by the South African Weather Service (SAWS), the following advisory guidelines are suggested. It is emphasized that these advisories are broad guidelines and should be interpreted considering the local aspects of the region such as soil types, cultural preferences and farming systems. Depending on the particular region, the prioritization of the guidelines will differ. The basic strategy to follow would be to minimize and diversify risk, optimize soil water availability and to manage the renewable resources (rain water and grazing) to uphold sound farming objectives. Long-term mitigation strategies should be considered by implementing techniques to enhance in-field water harvesting by reducing run-off and improving infiltration. Reduced tillage methods are very important in this regard, as is basin tillage, to capture rainwater in the drier areas. **The provinces should further simplify, downscale and package the information according to their language preference and if possible use local media and farmers' days to disseminate the information. Users are advised to be on the look-out and act on the daily extreme weather warnings as well as the monthly advisory.**

### I. CURRENT CONDITIONS

Figure 1

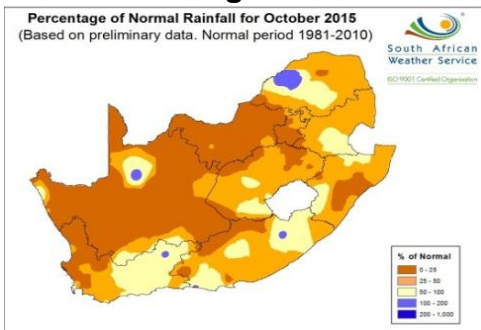


Figure 2

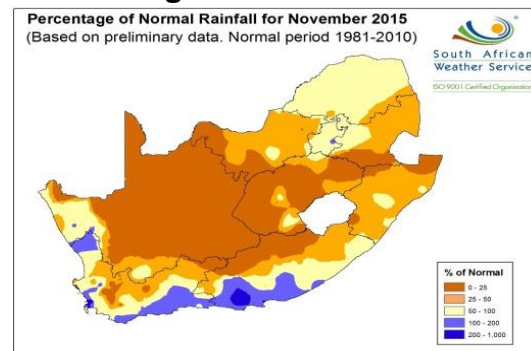


Figure 3

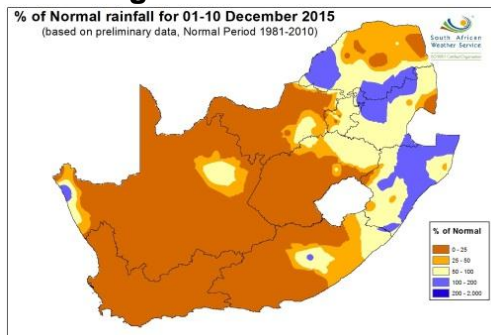
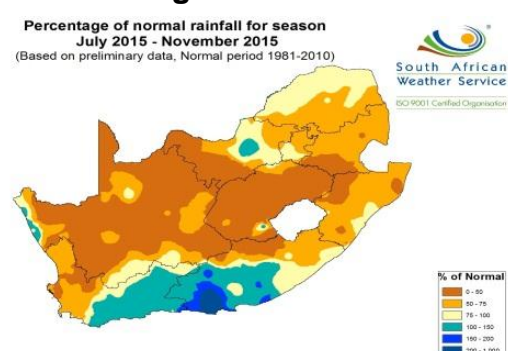
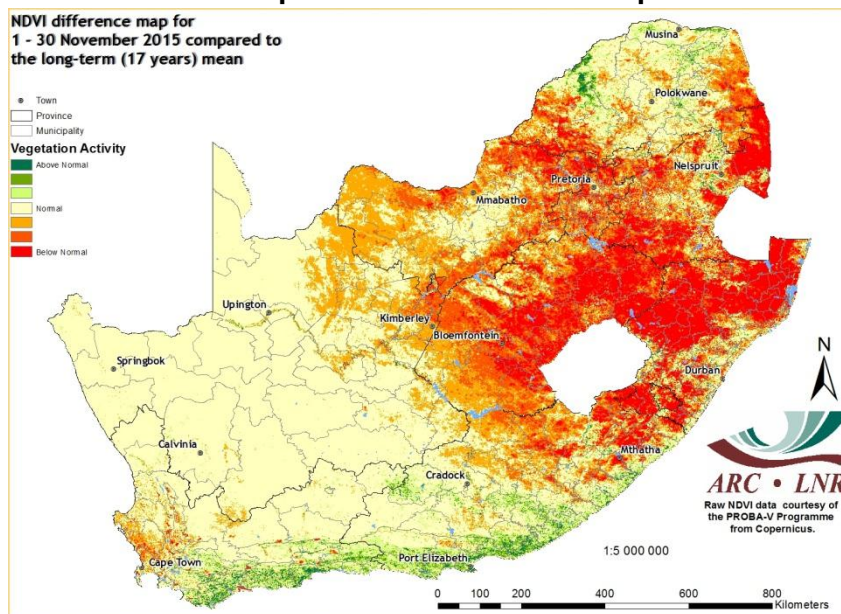


Figure 4



In October, below normal rainfall was received over most parts of the country (**Figure 1**). The below normal rainfall trend continued in November, except for the southern coastal areas where above normal rainfall was received (**Figure 2**). During the first ten days of December, the country continued to receive below normal rainfall with the exception of parts of KwaZulu-Natal, Mpumalanga and Limpopo Provinces where rainfall was above normal (**Figure 3**). For the season July to November 2015 (**Figure 4**), below normal rainfall was received but above normal over southern coastal areas.

### NDVI difference map for November 2015 compared to the long-term mean



Vegetation activity decreased to below normal over the central and eastern parts of the country, but increased along the south coast.

## II. CONDITIONS IN THE PROVINCES DURING NOVEMBER 2015

### Eastern Cape

Below normal rainfall was received but above normal along the coast. Some areas are dry but Joe Gqabi and parts of Chris Hani Districts remain very dry. Crops are in poor to reasonable condition but good mainly in Sarah Baartman. Rangeland conditions are poor but reasonable in Sarah Baartman and Amathole. Livestock is in poor to reasonable condition but very poor in some areas. Water sources for livestock and irrigation are very low and the level of major dams is lower at 75% as compared to 77% of 2014 during the same period.

### Free State

Below normal rainfall was received along with high temperatures, and very dry conditions have been reported in all areas. Incidents of severe storms accompanied by very strong winds and hail have been reported. Land preparations have started at a very low pace due to lack of soil moisture. The veld is in poor condition while livestock is dying in communal areas, and is in very poor condition in commercial areas and has to be hand fed in most areas. Veld fires have been reported in some areas. The level of dams has decreased as compared to the previous year (60% in 2015; 83% in 2014).

## **Gauteng**

Rainfall recorded was below normal and temperatures were above normal. There were reports of damages on vegetables by severe thunderstorms. The veld and livestock remain in poor condition. Water sources such as farm dams are drying up and some have already dried up. The level of major dams is lower at 81% as compared to 94% of 2014.

## **KwaZulu-Natal**

Below normal rainfall was received with above normal temperatures. The drought monitor for November indicates four districts are in an emergency drought state, where Zululand, Amajuba and UMzinyathi now fall into this category with UMkhanyakude. The other seven districts, including Harry Gwala, are in a severe drought status. Reports of livestock mortality due to drought and lack of grazing have been received. Beef calving season has started and cows that are calving in an already poor condition are dying soon after calving as are the calves because of compromised systems. Commercial farmers have reduced and continue to reduce herd numbers. The veld is still very dry and burnt due to high temperatures. Planting in some dry-land growing areas has started where good rains have been recorded. Irrigated maize e.g. in the Colenso area of Uthukela district is growing well as they do still have water from the Tugela River. The level of major dams has decreased as compared to the previous year (55% in 2015; 70% in 2014).

## **Limpopo**

The province received below normal rainfall coupled with normal to above normal temperatures. General conditions of grazing are poor in communal areas and fair in commercial areas. Livestock condition is deteriorating especially at communal areas. There were hailstorm damages in Maruleng and Greater Letaba Municipalities. Veld fire damages were reported in Waterberg District. Drought has resulted in livestock mortalities, and water in boreholes, which are the main sources of water in the province are drying up. Furthermore, earth dams are silted. The average level of major dams has dropped to 66% in 2015 as compared to 83% of 2014 during the same period.

## **Mpumalanga**

Rainfall received was below normal. Sugarcane harvested in the lowveld is in poor condition due to water restrictions. Harvesting of winter wheat continues and maize is at knee level but for those who planted late it is at the germination stage. The veld has been overgrazed but is in fair condition in the highveld. Livestock conditions are improving and there were hailstorms in Chief Albert Luthuli, Msukaligwa and Umjindi municipalities. Veld fires were reported in Lekwa municipalities. The level of major dams is lower at 64% as compared to 88% of 2014 during the same period.

## **Northern Cape**

Rainfall received was below normal. The veld is reportedly in reasonable to poor condition while livestock is in reasonable to good condition. There were veld fires in parts of John Taolo Gaetsewe. Table grapes are being treated for the export market in ZF Mgcawu and hay is in full production. Vegetables are in poor condition in John Taolo Gaetsewe. Water availability is a concern in all areas. The level of dams has decreased as compared to the previous year during the same period (67% in 2015; 97% in 2014).

## **North West**

The province received below normal rainfall. Very few dry-land farmers have planted as soil moisture remains very low. Crops under irrigation are experiencing heat stress. The veld is in poor condition. Livestock conditions are fair to poor and mortalities have been reported. There were

isolated veld fires in some areas. The level of major dams is low at 47% as compared to 69% of 2014.

### **Western Cape**

Below normal rainfall was received which resulted in the decline of veld conditions. Fodder is already being purchased for livestock in most areas. Due to the adverse conditions, harvesting in the Swartland commenced earlier than normal and should have been completed by end of November while harvesting of cash crops in the coastal regions of the Overberg is delayed by untimely rainfall. Good rainfall resulted in good conditions in the coastal parts, as well as in the Little Karoo and Langkloof. Satisfactory conditions regarding livestock, water supply, veld and pastures were reported. Fires which caused damages and losses to land and infrastructure were reported. The level of major dams is lower at 59% as compared to 80% of 2014.

## **III. AGRICULTURAL MARKETS**

### **Major grain commodities**

According to FNB, white maize prices advanced further as planting is delayed by lack of rain in some of the producing areas. Weather plays a pivotal role in price direction with more rains desperately needed to commence with planting. Wheat prices advanced slightly. The renewed weakness in the Rand/ US dollar exchange rate will continue to provide support for the wheat market, limiting downside risk. Oilseed prices rallied further as concerns over production conditions continued. The weather will continue to play a central role with planting delayed.

### **Domestic prices per Safex (R/t)**

<b>Commodity</b>	<b>Futures prices as at (2015/12/08)</b>				
	2015/12	2016/03	2016/05	2016/07	2016/09
White maize	R3699.00/t	R3662.00/t	R3652.00/t	R3640.00/t	R3669.00/t
Yellow maize	R3497.00/t	R3437.00/t	R3297.00/t	R3219.00/t	R3234.00/t
Wheat	R4560.00/t	R4681.00/t	R4709.00/t	R4708.00/t	R4321.00/t
Sunflower	R7135.00/t	R6800.00/t	R5805.00/t	R5850.00/t	R5985.00/t
Soybeans	R6280.00/t	R5970.00/t	R5655.00/t	R5685.00/t	R5720.00/t
Sorghum	N/a	R3230.00/t	R3201.00/t	R3078.00/t	R3097.00/t

### **SAGIS weekly bulletin: 2015/12/10**

### **Livestock domestic markets**

FNB indicated that the domestic beef market maintained a firmer trend across most categories on the back of improved demand. Recent rains have helped in reviving pastures but conditions in some areas remain poor forcing producers to source feed. The lamb and mutton markets posted further gains supported by better uptake on markets. Supply outlook remains bearish due to the worst drought in decades. Pork and baconer prices trended firmer supported by good demand. In the short to medium term prices are expected to trend slightly upwards due to increased seasonal demands. Poultry prices remained firm supported by improved uptake across markets. The medium term outlook for prices remains bearish.

Producer prices for selected livestock commodities	Beef	Mutton	Pork	Poultry
Open market: Class A / Porker / Fresh whole birds (R/kg)	35.52	54.99	24.90	23.30
Open market: Class C / Baconer / Frozen whole birds (R/kg)	29.13	41.77	22.20	22.71
Contract: A2/A3* / Baconer/ IQF (*includes fifth quarter) (R/kg)	35.73	55.53	23.27	19.71
Import parity price (R/kg)	34.57	36.87	30.39	16.06
Weaner Calves / Feeder Lambs (R/kg)	17.80	25.83		

**FNB AgriCommodities:2015/12/11**

**NB: Users are advised that these are just indicative prices therefore it is imperative that clients investigate their own individual basis value when marketing their products (livestock and grain).**

#### **IV. SADC REGION**

The Famine Early Warning System Network for October 2015 to March 2016 states that the onset of the seasonal rains is late in northeastern South Africa and neighboring Lesotho, southern parts of Angola, Swaziland, and in western areas of Zambia. For most countries in the region, seasonal rains typically begin in November. National and International forecasts predict low rainfall during the October to December period, which could lead to an erratic or delayed start to rainfall. The ongoing El Niño is forecast to continue until mid-2016, increasing regional concerns that several countries will experience below-average rainfall during the season. Poor households in maize deficit areas are well into the lean period and have been relying on market purchases for an extended period this season. Staple food prices in several countries continue to increase, reducing poor household purchasing power. Humanitarian assistance began in parts of Zimbabwe, but has not started in Malawi. Informal trade flows between Mozambique, Malawi, Zambia, Zimbabwe, and South Africa are strong. Crisis (IPC Phase 3) acute food insecurity outcomes are currently taking place in Malawi, Zimbabwe, and Madagascar. Poor households in cereal deficit areas have depleted their own food production stocks and are facing limited labor opportunities. Crisis (IPC Phase 3) outcomes are expected to continue in these countries through March 2016 in the absence of humanitarian assistance. Some areas in Zimbabwe will improve slightly and will be Stressed (IPC Phase 2) in the presence of humanitarian assistance.

[The Integrated Food Security Phase Classification (IPC) is a set of standardized tools that aims at providing a "common currency" for classifying the severity and magnitude of food insecurity.]

#### **Summary of the reports**

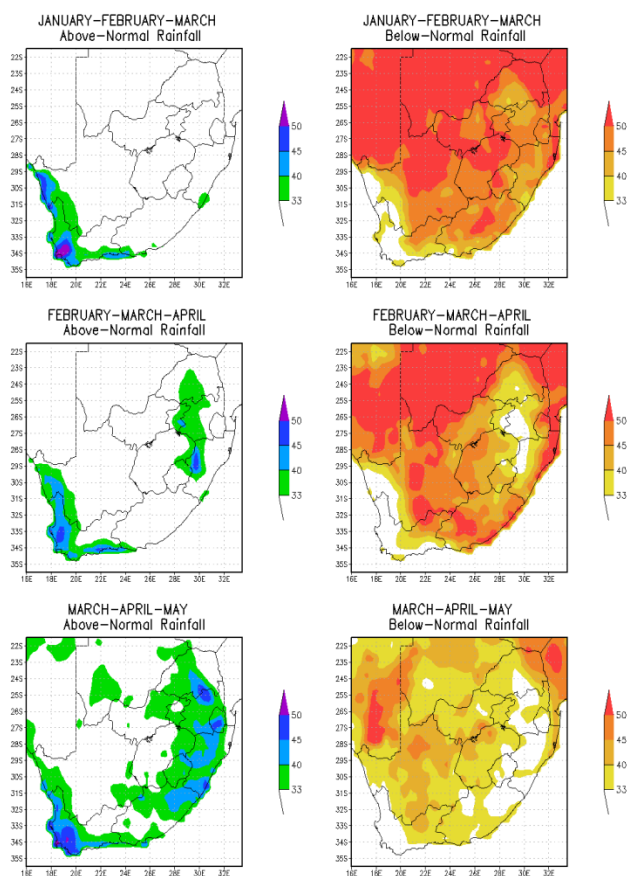
Below normal rainfall was received in most provinces coupled with above normal temperatures. Drought continues in many provinces. Veld and livestock conditions are poor in the majority of areas. Irrigated crops are under stress due to lack of sufficient water and high temperatures. Planting for the season could not begin in most areas due to lack of moisture in the soil. Veld fires were reported in Free State, Limpopo, Northern Cape, North West, Mpumalanga and Western Cape. There were severe thunderstorms that caused damages in Gauteng, Limpopo and Free State. Livestock mortalities were reported in KwaZulu-Natal, Limpopo, North West and Free State.

The level of major dams is low in all provinces as compared to the 2014 levels during the same period. Over SADC, poor households in maize deficit areas are well into the lean period and have been relying on market purchases for an extended period this season. Staple food prices in several countries continue to increase, reducing poor household purchasing power.

## V. MONTHLY CLIMATE OUTLOOK

### Seasonal Climate Watch: January to May 2016

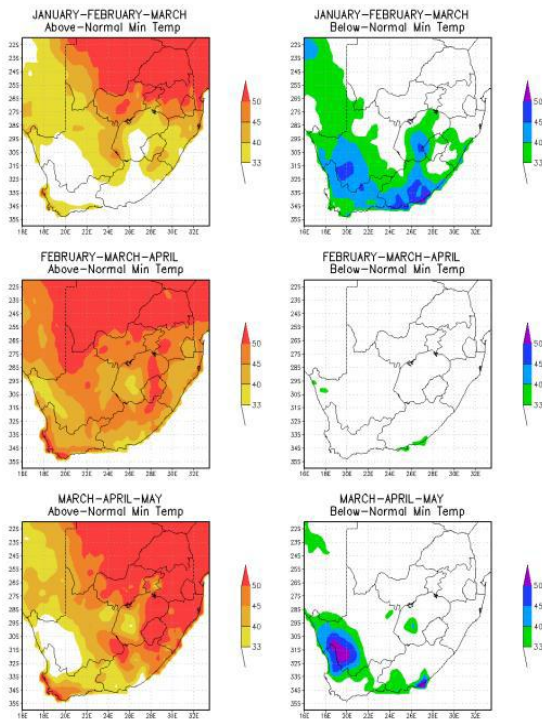
**Figure 1- Rainfall**



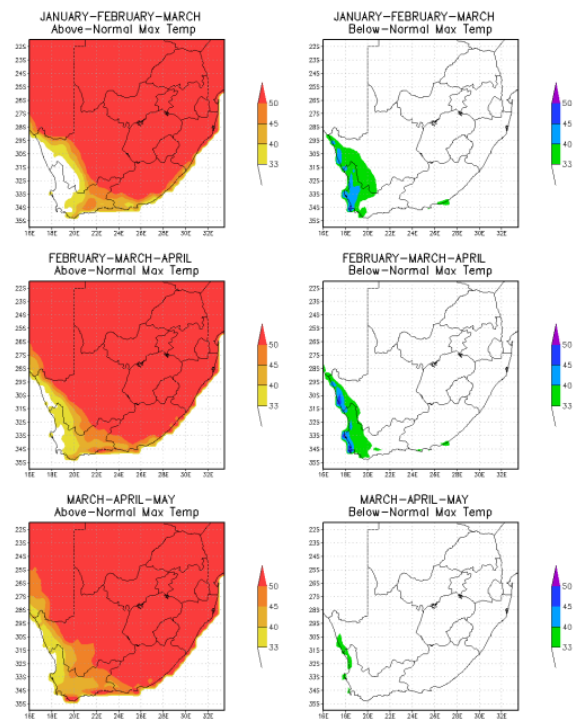
The forecasting system indicates enhanced probabilities of below-normal rainfall for the late-summer season as well as early autumn countrywide. Mid-autumn indicates some chances for above-normal rainfall for parts of the eastern half of the country. The late-summer period also indicates the likelihood for extremely below-normal rainfall totals.



**Figure 2 - Minimum temperatures**



**Figure 3 - Maximum temperatures**



The forecasting system indicates generally above-normal temperatures across the country through late-summer towards mid-autumn, with an exception of below-normal minimum temperatures for the south western parts of South Africa.

**How to interpret the forecast maps**

- There are three sets of forecast maps: the rainfall, minimum and maximum temperatures.
- Each set consists of maps showing the probabilities for above-normal (left panels) and below normal (right panels) conditions to occur.
- For each forecast map a probability percentage is given on a scale of 0-50% and above (the colour bars on the right hand side of each map) for the rainfall or temperatures for the season, i.e. JANUARY - FEBRUARY – MARCH 2016.
- The forecast probabilities indicate the **direction** of the forecast as well as the amount of **confidence** in the forecast.

For further clarification using JANUARY - FEBRUARY – MARCH 2016 rainfall (**Figure 1**) as an example:

Gauteng Province, for the above normal rainfall category, is shaded in white (<33%). In the below normal rainfall category it is shaded in orange (>45%).

Comparing the two:-

- above normal: white (<33%)
- below normal: orange (>45%)

The below normal rainfall category for January to March 2016 has the higher value and is therefore favoured. This means that rainfall is anticipated to be below normal over Gauteng Province during the period January to March 2016.

### **State of Climate Drivers**

Observations show that ENSO is currently in the strong El-Niño situation. The atmospheric response in support of this strong SST (sea surface temperature) warming over the equatorial Pacific is manifested, among others, by the weakening of the trade winds and excess rainfall in the east-central tropical Pacific. Most of the forecast model's predictions indicate the maturity of the El Niño condition through the late austral summer and its gradual weakening towards the autumn and early winter seasons.

In summation, rainfall is anticipated to be below normal in most areas for the remainder of summer and into autumn. Temperatures are anticipated to be above normal. Farmers are encouraged to continually check updates i.e. seasonal forecasts and utilize 7 day weather forecasts for short term planning.

With the above forecast in mind, the following strategies are recommended:

## **VI. SUGGESTED STRATEGIES**

**With the seasonal forecast for dry and hot conditions for the remainder of summer, together with limited moisture available, farmers are advised to be conservative in their planting i.e. planting density/cultivar/area being planted.**

### **A. Rain-fed crop production**

#### **Soil choice**

- Choose suitable soil type.
  - Suitable soil and land use management practices that would control wind and water erosion in cultivated lands are suggested.
  - Avoid marginal soils - shallow and low water holding capacity soils.
  - Rather plant in soils with high water holding capacity or with shallow water table.
- Ascertain that the soil profile has enough water when planting commences.
- Roughen the soil surface to enhance rain water penetration and reduce runoff.
- Minimise compaction by reducing the passing of heavy machinery in the field.
- Add organic material to improve soil structure.

#### **Land preparation**

- Avoid where possible soils with pronounced plough pans.
- Consider practicing conservation agriculture such as zero or minimum tillage.
- Cover soil with organic matter or cover crops.
- Practice crop rotation.
- Do not expand land under crop production unnecessarily.
- Prioritise fallow land.

#### **Crop choice and planting**

- Choose drought resistant cultivars.



- Provide flexibility and diversification.
- Rather plant early in the season than late, but stay in the normal planting window and follow the weather and climate forecast regularly so as to make informed decisions.
- Consider staggered planting - spreading over weeks.
- Do not experiment with new and unknown cultivars and also avoid unnecessary capital investments.
- Consider intercropping for improved soil structure and pest/diseases control.
- Planting in a controlled environment (e.g. green house) is advisable where possible.

### **Crop management**

- Adjust planting density accordingly.
- Consider mulching to minimize evaporation.
- Control weeds regularly.
- Consider a conservative fertilizing strategy during dry conditions.
- Consider organic fertilization.
- Scout for pests and diseases regularly and control where necessary.
- Practice water harvesting techniques e.g. construction of basins, contours, ridges.

### **B. Irrigation farming**

#### **The current drought will have a negative impact on irrigation.**

- Remove all weeds containing seeds, but keep other vegetative rests on the land because that will reduce evaporation.
- Check and repair all tools and machinery especially where there are water leaks.
- Obtain the relevant seeds to be planted considering the climate forecast.
- Be aware of the state of regional water resources and whether it will be adequate for irrigation.
- Irrigate with the correct amount, never over-irrigate.
- Timing of irrigation - rather late afternoon or early evening to reduce evaporation.
- Be aware of current and expected weather conditions and re-look at the area to be planted as there are already water restrictions in some areas.
- Manage irrigation so that the plant receives water only when needed.
- Use drip irrigation rather than sprinklers.
- Quality of irrigation system:
  - Repair leaks,
  - For canal irrigation - line with concrete to reduce water loss.

### **C. Domestic and home garden water use**

- Conserve existing water supplies.
- Eradicate water weeds.
- Limit water waste and losses.
- Repair leaking pipes.
- Re-use water and retain high quality.
- Use grey water in gardens.
- Harvest water during rainy days.

#### **D. Stock farming**

- Keep stocking rates conservative and even lower to protect grazing.
- Never exceed carrying capacity of plant associations.
- Provide lots of drinking points where possible.
- Provide additional fodder and enhance nutritional value of dry grazing/feed with licks:
  - Phosphorous deficiency is a major problem.
  - Licks should (in most cases) provide:
    - Phosphorous.
    - Urea (to help with the break-down of dry vegetation).
    - Salt.
    - Molasses.
- Deficiencies differ according to vegetation composition/soil properties/climate.
- Analysis of vegetation/soil samples can benefit the decision for supplement composition.
- Sell mature, marketable animals (to help prevent overstocking/ overgrazing).
- If grazing is in danger, herd animals into pens where different animals can be segregated and fed separately.

#### **E. Grazing**

##### **Grazing has deteriorated throughout the country.**

- Subdivide your grazing area into camps of homogeneous units (in terms of species composition, slope, aspect, rainfall, temperature, soil and other factors) to minimise area selective grazing as well as to provide for the application of animal management and veld management practises such as resting and burning.
- Determine the carrying capacity of different plant associations.
- Calculate the stocking rate of each, and then decide the best ratios of large and small animals, and of grazers or browsers.
- Provide periodic full growing-season rests (in certain grazing areas) to allow veld vigour recovery in order to maintain veld productivity at a high level as well as to maintain the vigour of the preferred species.
- Do not overstock at any time to avoid overgrazing.
- Always eradicate invader plants.
- Periodically reassess the grazing and feed available for the next few months, and start planning in advance.

#### **F. Pests and diseases**

##### Crops

- Fruit crop farmers should regularly scout for pests and diseases and contact the local agricultural office for advice on best control measures. Farmers should further implement phytosanitary measures.
- Irrigation farmers should monitor for pests and diseases especially those associated with humid and hot conditions.

##### Livestock

- Follow the vaccine routine and consult with the local veterinarian.

#### **G. Veld fires**

The provinces and farmers are advised to maintain firebreaks in the winter and summer rainfall areas. An owner of the land who is obliged to prepare and maintain a firebreak must ensure that,

with due regard to the weather, climate, terrain and vegetation of the area, the following is taken care of in terms of installing firebreaks (Chapter 4 of the National Veld and Forest Fire Act No. 101 of 1998):

- It has to be wide enough and long enough to have a reasonable chance of preventing a veld fire from spreading to or from neighbouring land.
- It does not cause soil erosion and
- It is reasonably free of inflammable material capable of carrying a veld fire across it.
- Firebreaks may be temporary or permanent.
- Firebreaks should consist of fire-resistant vegetation, inflammable materials, bare ground or a combination of these.
- Firebreaks must be located in such a way as to minimize risk to the resources being protected.
- Erosion control measures must be installed at the firebreak.

*Firebreaks can be made through the following methods:*

- Mineral earth firebreak:
  - Through ploughing, grading, other earth movement.
- Use of herbicides.
- Use animals to overgraze specifically to minimise fuel.
- Strategic placement of burned areas,
  - Not to be done on days with fire hazard (windy and dry/hot).
- Plant fire resistant plants.
  - Plant species selected for vegetated firebreaks must be non-invasive and capable of retarding the spread of fire.

*Maintaining firebreaks:*

- Mow, disk, or graze vegetative firebreaks to avoid a build-up of excess litter and to control weeds.
- Inspect all firebreaks for woody materials.
- Inspect firebreaks at least annually and rework bare ground firebreaks as necessary.
- Repair erosion control measures as necessary.
- Access by vehicles or people must also be controlled.
- Bare ground firebreaks, which are no longer needed must be stabilized i.e.
  - Sow grass.
  - Mulch.

*What to do when conditions favourable for veld fire are forecast:*

- Prohibit fires in the open air during periods of high fire hazard and establish a fire control committee.
- To control fires, an alarm system, fire-fighting teams, and beaters must be organized in advance and plans prepared.
- Livestock should be moved out of grazing land to a safe place.

*What to do during veld fire:*

- Water is generally not available in sufficient quantities or at adequate pressure for the control of major fires; however, sand or other loose mineral soil material can be an effective method of control.
- Tree branches can be used to beat fire.

## H. Heat stress – bad for productivity

- Signs of heat stress on livestock:
  - Bunching in shade, high respiratory rates, open mouth breathing.
- What to do:
  - Offer shade.
  - Offer water- keep good quality water in front of animals.
  - Wet with sprinklers/fire hose.
  - Water ground.
  - Avoid overworking animals.
  - Control insects. Biting insects, such as flies can further stress livestock and interrupt their cooling. If pastures or buildings draw insects to livestock during times of extreme heat, provide proper insecticides or considering relocating your livestock.

## Poultry

- Provide cool, clean, quality drinking water to your poultry. Water will help keep your birds cool.
- Always make sure your poultry is in a well-ventilated area in which there is nothing to obstruct the airflow.
- Provide feed during the coolest part of the day.
- Supplement drinking water with electrolytes.
- Reduce the number of birds kept in a house or in an area.
- Avoid excessive activity during the hottest part of the day.

## I. Severe thunderstorms/flash floods

### Building resilience:

- Identify resources/facilities within 50km that can be utilized and can be of help during emergencies.
- Be sure to have legal and adequate markings to identify your livestock.
- Stay well informed about livestock in your possession and conduct an inventory after the event.
- Monitor television and local radio stations for information regarding severe storms/flash floods in your region.
- Identify natural or built areas/shelters where animals can be kept during such conditions
  - Sufficient height to be above water level,
  - Sheltered from strong winds and wetness,
- Restrict access to high-risk areas such as low lying fields close to streams.
- Store food in safe areas sheltered from wetness to be used after storms/flash floods.
- Keep pesticides and other chemicals in areas where water will not be contaminated during extreme rainfall/storm events.
- Inspect/repair farm dams
  - Before rainy season, after each event.

Drought/very dry conditions continue to be reported in most provinces. The seasonal forecast favors below normal rainfall in most provinces. Maximum temperatures are anticipated to be above normal. With the seasonal forecast in mind, and the current drought/very dry conditions in provinces, farmers are advised to continue to approach the season with extra caution.

Dry-land farmers who are still planning to plant should wait for sufficient moisture before planting, and still plant within the planting window. Also, they should consider drought tolerant and short season cultivars including sorghum where possible. Irrigation farmers should reduce the planting area in line with water restrictions in their areas and also consider the below normal rainfall forecast. Farmers should follow the weather and climate forecast regularly so as to make informed decisions. Water restrictions have been implemented in some provinces hence, water and other resources need to continually be conserved in accordance with the Conservation of Agricultural Resources Act 1983, (Act No. 43 of 1983).

Livestock must continually be kept in line with carrying capacity of the veld and should be provided with additional feed including licks to give sufficient nutrition. Farmers are advised to continue to reduce livestock to protect the limited grazing i.e. selling of animals. Veld fires have been reported in many provinces and the risk remains high for conditions conducive for veld fires as the veld is dry. Farmers are encouraged to maintain firebreaks in winter and summer rainfall areas and adhere to veld fire warnings. Severe thunderstorms with damaging winds and hail as well as heat waves are likely to re-occur and therefore measures to combat these should remain in place. Isolated localised flooding is also possible in summer rainfall areas; precautionary measures for these should be in place.




**The users are urged to continuously monitor, evaluate, report and attend to current Disaster Risk issues. It is very important and mandatory for farming communities to always implement disaster risk measures and maintain good farming practices.**

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The climate advisory should be disseminated widely. Users are advised to be on the look-out and act on the daily extreme weather warnings as well as the monthly advisory. Information sharing groups are encouraged especially among farming communities for sustainable development. In general, effective communication among all stakeholders in the sector will enhance effective implementation of risk reduction measures/early warning services. It is the responsibility of farmers to implement disaster risk measures.

The Disaster Management Act 2002, (Act No. 57 of 2002) urges Provinces, individuals and farmers, to assess and prevent or reduce the risk of disasters using early warning information. The current advisory can be accessed from the following websites: [www.daff.gov.za](http://www.daff.gov.za) and [www.agis.agric.za](http://www.agis.agric.za).

**For more information contact:-**

<p>DAFF, Directorate: Climate Change and Disaster Management Private Bag X93 Pretoria 0001 Tel:012 309 5722/23; Fax: 012 309 5878 Email: <a href="mailto:MittaA@daff.gov.za">MittaA@daff.gov.za</a></p> 	<p>SAWS: Private Bag X097 Pretoria 0001 Tel: +27 (0) 12 367 6000 Fax: +27 (0) 12 367 6200 <a href="http://www.weathersa.co.za">http://www.weathersa.co.za</a></p> 	<p>ARC: Institute for Soil, Climate and Water Private Bag X79 Pretoria 0001 Tel: 012 310 2500 Fax: 012 323 1157 Email: <a href="mailto:iscwinfo@arc.agric.za">iscwinfo@arc.agric.za</a>, <a href="http://www.arc.agric.za">http://www.arc.agric.za</a></p> 
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