GRAIN SA
GRAAN SA

December
2011

PULA IMVULA

Grain SA magazine for developing producers

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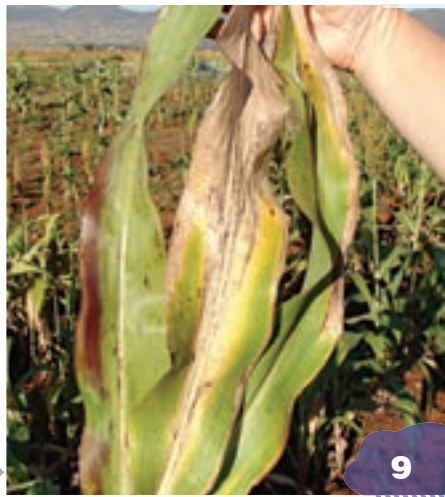

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Being a successful farmer can be very challenging

THE POLITICAL ISSUE AROUND LAND WILL PROBABLY TAKE A LONG TIME TO BE RESOLVED TO EVERYONE'S SATISFACTION. IN OUR FARMER DEVELOPMENT PROGRAMME, WE DO NOT CONCERN OURSELVES WITH THE POLITICS – WE ARE FARMERS WHO WANT TO HELP OTHER FARMERS BECOME FARMERS.

We understand that some people have access to large lands, while others only have access to small pieces of land. Some areas are better grain producing areas and some land has a higher potential than other land. We often get phone calls or sms messages from people who want help. Before we can see whether or not we can help you, we need the following information:

- Where is your land?
- What is the size of your land?
- What is your system of tenure – are you on communal land, is it commonage land, is it your own land (bought yourself, or through PLAS or LRAD programmes of the Department of Land Affairs)?
- Do you have tractors and implements?
- Are you a full time farmer?

Mme Jane says...

It is already December and the year is drawing to a close. I trust that you have managed to plant all the summer crops that you were planning to plant and that the crops are looking promising. Don't forget to scout for insects and diseases – after all your hard work you don't want to lose the crop to some little insect!

We were blessed this year to have funding from the Maize Trust for our entire programme, as well as from the Winter Cereals Trust, the Sorghum Trust as well as the Oil and Protein Seeds Development Trust. Without their funding we would not be able to work with the farmers and make our contribution to the transformation of the sector as well as to household and national food security.

The training courses and study group meetings will commence again in February – please make sure that you get the programme from your nearest office. We have the offices that you know – Zeerust, Nelspruit, Vryheid, Ladybrand, Kokstad and Mthatha. We have also opened a new office in Belfast (Mpumalanga). Naas Gouws is our new coordinator there and we wish him a long association with the programme and all the developing farmers. Many of you have already met Naas as he has done a lot of training in isiZulu and Ndebele.

We wish you all a peaceful and blessed Christmas and a grain filled 2012.

Being a successful farmer can be very challenging

When we have this information, we are able to see how best to advise you.

There are many people who say that they want to be farmers. However, you only have to look at thousands of hectares of communal land, as well as some redistributed land to realise that being a farmer is very challenging. It is not easy and there are a number of prerequisites to being successful. If you want to be successful:

- The most important single factor is that you must be committed. We have seen no success with people who are part time farmers – grain farming requires your full attention. You must be willing to be part of a farmer development programme – attend study group meetings, farmer days, training courses etc.
- You must also have access to productive, arable land (for grain farming).
- Your land should be in an area where the rainfall and soil type allows for profitable production (shallow soil and a low rainfall make it impossible to farm profitably).
- Unless your land is very small, you will need access to tractors and machinery. This is a serious problem as these items are very expensive and the government departments do not always give this equipment to dedicated, bona fide farmers.
- There should be a market for the crop you are planning to plant.
- The infrastructure should be available to handle the crop you are planning to plant – for example, in the Eastern Cape, most areas are unsuitable for wheat production as there are no combine harvesters, no bulk trailers for transport, no silos for bulk handling and no grain driers (remember that we harvest wheat in the summer time and it is also grown in the summer rainfall areas which means that we should be able to dry the grain).

We would really like to assist any person who has access to good arable land in a suitable climatic area to become a grain farmer. Let us make an effort to use all the land that is lying unused – once all that land is in production, then we can talk about redistributing land currently in production. Let us not forget that "The farmers feed the nation". Farmers are our future!

JANE MCPHERSON, PROGRAMME MANAGER OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

Soil acidity and the importance of liming

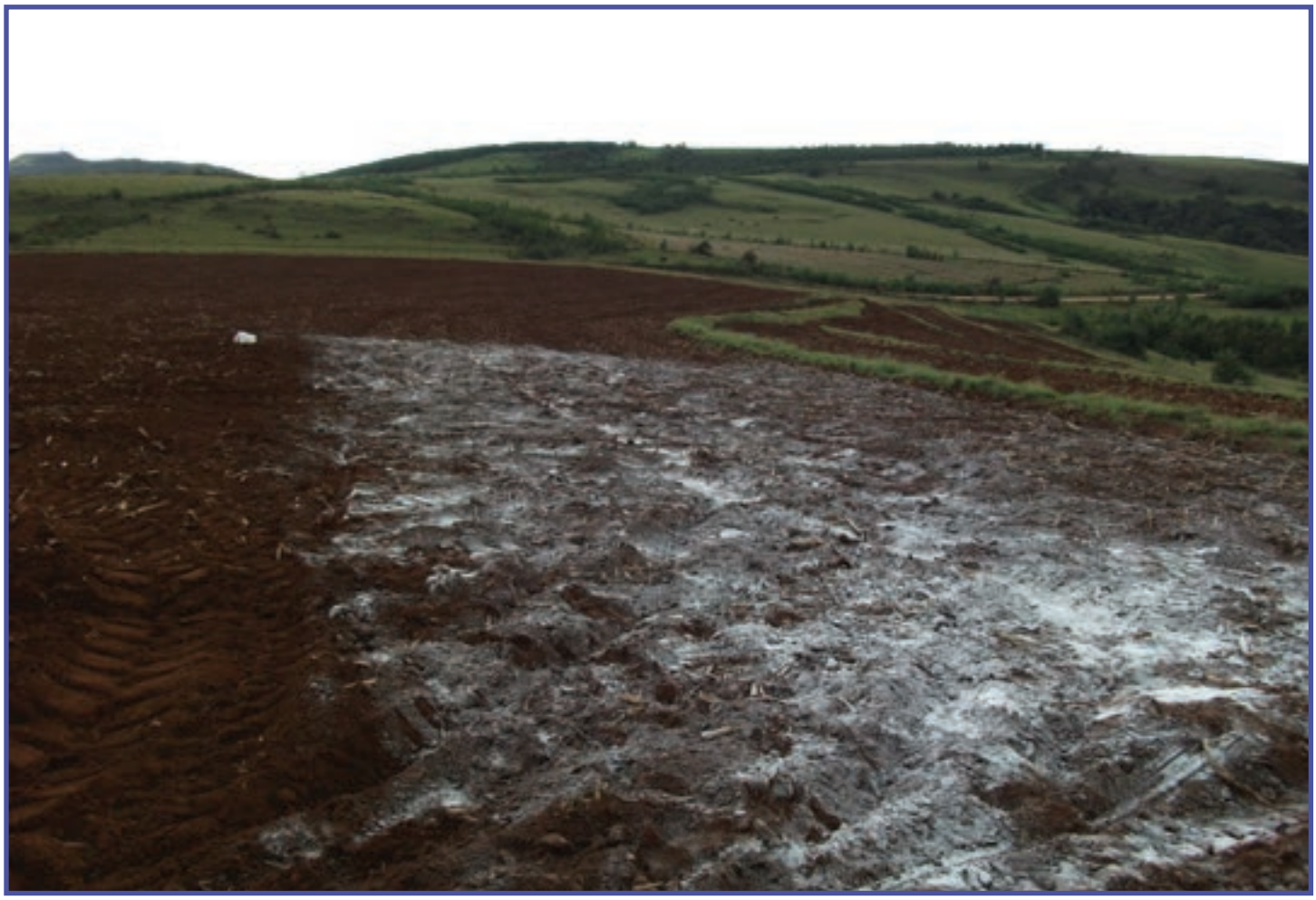
Acid soils are very common and are a major cause of poor yields of crops. The most critical effect of the soil acidity is that root growth is inhibited. Short stubby roots, lacking adventitious roots are a common symptom of severe soil acidity.

Restricted root growth results in increased wilting, as plants cannot take up sufficient water, even from fairly moist soils. Uptake of N and P is also limited by the small root system and nutrient deficiency symptoms may occur as well as the financial loss of fertiliser not being used optimally with reduced yields.

There are differences between various crops with respect to their ability to grow on acid soils. Maize is more sensitive to acidity than dry beans and cowpeas. The only effective way of dealing with soil acidity problems, is by applying lime into the topsoil.

Research has shown that liming acid soils is one of the most important aspects of crop production. Although a bag of lime costs much less than a bag of fertiliser, often very large quantities of lime are required to neutralise the soil acidity. For instance, a plot of ten metres by ten metres (100 m²) may need one or two bags of lime, but only 2 kg of fertiliser. This means that liming involves the cost of the lime, as well as the cost of transport and incorporation, which makes the liming operation for resource poor farmers, as well as farmers that live in rural areas very expensive. However, liming is essential for improving yields on acidic soils. Use of fertiliser alone will not improve yields where soil acidity is severe.

Lime is not required every season. After the correct application of the required amount of lime, no further lime will be required for up to five years or more.



Liming acid soils is one of the most important aspects of crop production.

Soil acidity and the importance of liming

The only way of determining lime requirement is by soil testing. Soil samples must be taken from individual lands or plots and be sent away for analysis. The results of the analysis will determine how much lime is required per hectare for that specific land or plot.

Table 1 shows the conversions that will assist in the correct application rate for a specific area.

To be effective, lime must be spread evenly over the soil surface and then incorporated into the soil. Incorporation should be done by discing or ploughing. On very acidic soils, lime should be incorporated several months before planting to allow time for the neutralisation of the acidity to take place. Generally, liming occurs six to eight weeks before planting.

If a person is sick, he or she will go to the doctor. The doctor will examine the patient and give him or her the correct medicine or script to cure the illness. This is no different to soil. Send a sample to the laboratory and find out what your soil requires to be healthy. Soil is a living entity, requiring food, water and air. If you look after your soil, the soil will respond by giving you better yields.

Table 1: The Correct application rate for a specific area.

Lime recommended per hectare	Area covered by 50 kg lime
2 t/ha	250 m² (16 m x 15,6 m)
4 t/ha	125 m² (11 m x 11,4 m)
6 t/ha	83 m² (9 m x 9,2 m)
8 t/ha	63 m² (8 m x 8 m)
10 t/ha	50 m² (7 m x 7 m)
15 t/ha	33 m² (6 m x 5,5 m)
20 t/ha	25 m² (5 m x 5 m)

Severe soil acidity results in short, stubby roots and lack of adventitious roots.

IAN HOUSEHAM, PROVINCIAL CO-ORDINATOR OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

Preparing for your next wheat crop

Much wheat is produced in the Free State where the average rainfall is between 625 mm to 875 mm, of which roughly 20% falls during the period from April to September. Besides being very low in quantity, the rainfall in the winter is also very uncertain and the wheat is largely dependent upon the reserve moisture which can be stored in the soil in the late summer and autumn.

Water

Moisture is the most important factor that influences the production of dry land wheat in the summer rainfall regions. The type of soil as well as the tillage practices influences how much moisture can be stored in the soil. This is one of the most critical factors in areas where the growing season is dry and the development of the crop is dependent on stored moisture.

Soil texture

Soil water is stored in the spaces between solid soil particles in a way similar to a sponge. The smaller the soil particles and the more evenly shaped they are, the smaller the spaces will be and the tighter the water is held in the soil. The larger the spaces between the particles, the more easily the water is available to the plant.

The texture of the soil is determined by the size and shape of the soil particles. The sandy soils are made up of larger unevenly shaped particles that have larger spaces in between. The more clay soils are made up of smaller evenly shaped particles that fit together very closely. The more clay soils absorb water more slowly and it is also more difficult for the plant to get the water from the soil. The sandy soils have large spaces between the particles and so the water can drain away very fast – thus the soil dries out quickly. Water cannot permeate clay easily and it is difficult for the plants to get the water. Extreme sandy or clay is not ideal for wheat production.

Relevance for wheat production

The normal cultivation practices for wheat in many areas include the use of various tillage systems. Ploughing creates a plough pan at the depth at which the face of the plough interacts with the soil. Sweeps, on the other hand, in many soil types, with a low proportion of plant residues can create a compaction layer at between 10 - 15 cm below the surface of the soil. It is extremely important to break this compacted layer prior to planting, by using suitable tines (or ripping action). This action will lead to the full development of secondary roots which will then be able to access the entire soil profile and stored moisture.

Preparing for your next wheat crop

Moisture management

Soil has the capacity to store water in the small gaps between the soil particles. The water that is to be stored in the soil is from the rain which falls mostly in the autumn and spring. After the previous crop has been harvested, it is necessary to loosen the soil so that the falling rain can penetrate the soil and be stored for the following crop.

Unfortunately, with loosening and turning the soil, weed seeds and the wasted grain from the previous harvest come into contact with the moist soil and therefore germinate. Any weeds growing on the land that is being prepared for wheat production are the enemy of the next crop as they will be using the moisture that should be stored for the coming crop and they also are using the soil nutrients that should be available for the next crop. It is therefore very important that nothing should be allowed to grow on the land until the next wheat crop is planted (usually between April and July, depending on the area, variety and length of the previous fallow period).

Soil cultivation and preparation

Soil preparation is the most important aspect of the entire wheat production cycle. It is also the most expensive practice. If the soil preparation has not been adequately done, it is not possible to rectify the situation after the crop has been planted.

The most important processes that are affected by the tillage of the soil include infiltration and evaporation. The availability of moisture in the soil is the single most important factor in grain production in South Africa and it is therefore crucial that all tilling of the soil be aimed at optimising soil water filtration and minimising evaporation. For this, the best results are achieved by keeping the top soil loose (±5 cm) in the presence of organic material. This results in faster penetration and reduced evaporation of moisture. Initially the speed of evaporation is high but it is reduced very quickly.

With minimum-till, more than 15% of the plant stubble is left on the land and the weed control is chemical. The plant stubble functions as a source of organic material for the soil microbes and to minimise water and wind erosion. Minimum-till consists mainly of the use of tine implements and rippers to loosen the soil and other methods of tillage are limited to the very minimum. As much of the plant residue is left on the land and the following crop is planted into the residue by planters specifically designed to cut through the residue.

Farmers are consciously or unconsciously searching for methods of production that will increase the profitability of crops. Due to the fact that tilling the soil has a high cost implication, it is sensible to view this as an area to reduce production costs. Before looking at alternative methods of tillage, the farmer should understand the purpose of the alternative methods. The change should bring about a positive change to the current situation (more profit).

INFORMATION OBTAINED FROM THE GRAIN SA INTRODUCTION TO WHEAT PRODUCTION MANUAL

William Matasane, Jannie de Villiers and Koos Mthimkhulu at the Hebron Farmers day.

Is your age an asset or liability to the wheat industry?

South Africa is facing major problems in respect of the age of the farmers. The active farmers with land, experience and skills are in the higher age bracket. Soon they will be phasing out of agriculture leaving a huge vacuum. We do not see the problem being solved easily. One of the areas where this is very evident is in the communal areas – the young people are not farming.

Resistance to change factors

Unfortunately, as you get older, you become more set in your ways. Quite often we hear people saying – "In the old days, we used to do it this way and it worked!" It is true that change takes place daily. The older the individual, the greater the resistance to change. It becomes more and more difficult for older people to change their ways – they are comfortable doing things the way they have always done them. Farming practices are changing very rapidly – the use of chemicals for weed and pest control, no-till practices and the use of genetically modified (GM) seeds and some of our older farmers are finding is difficult to change.

Risk

Elderly farmers find it extremely difficult to invest in high risk operations. Protecting their "wealth" is far more important due to declining abilities. They become conservative in their approach. On the other hand, their sons are willing to expose themselves to modern technology and risky business practices and accept the challenges of the day. This can create conflict between the two generations which often leads to the younger man leaving the farm.

How do we reconcile?

A "comfort zone" is unavoidable and every human being is prone to this phenomena. The "comfort zone" is the area in which you feel comfortable. For example, if you have always used a plough, you will want to continue to use a plough and not change to other more modern methods of tillage.

At an approximate age of 55 years farmers reach this point. This is the time to retire from major activities and letting a younger generation (or sons) take the business forward. However, a farmer cannot retire if there is no one interested in taking over the farming business. Today, we see many farmers in their 70's still farming and producing food for their families simply because there is no one else to do the farming.

In a majority of cases there is no plan in place for gradual transfer. The new generation does not seem to be all that keen on agriculture as a career because of the hard work and low profit realised.

Agriculture has been neglected as a career

In the early 1960's the same situation occurred. However, the government realised what was happening and students were educated in large numbers to fill in the vacuum. Profit margins in agriculture picked up and the situation was restored. At this stage, we are going to have to make a huge effort to address the situation again. If we do not address the matter, we will be faced with poorly educated farmers with poor skills.

Agricultural schools

Many agricultural schools were closed down so that children could follow academic courses. It is very difficult to open up the agricultural subjects again. Agriculture must be taught at a young age so that the children develop a love for farming and choose it as a career.

Is your age an asset or liability to the wheat industry?

Farm labour

Being a farm labourer is not easy – farming requires long hours and in many cases, farm work has to be done seven days a week (for example, diary farming). This has nothing to do with politics or discrimination – in all countries, farming is hard work and involves long hours. Many previous farm workers moved to cities and townships in the hope of receiving a house. The farmers were forced into mechanisation and now jobs have been lost. One of the major challenges today is job creation – jobs can be created in the agricultural sector, but we must all understand clearly that agriculture requires dedication and long hours.

How do we cure the situation?

Schools (education)

We need to bring back agriculture into the school curriculum as a subject of choice. In this way skills can be developed and passed on.

Government

We need a clear well drafted (implementable) policy for the agricultural sector. We have the policy, but we are failing to implement the policies.

Small farmers as stabilising factor

No land should lie unutilised. Small farms are a huge stabilising factor for South Africa. People who do not have a formal job can create a livelihood for themselves on small pieces of land – feeding yourself and your family is a very basic need that can be addressed by farming on even a very small scale.

Work ethics

The South African nation has become very unproductive. Work ethics need to be restored from a young age. We have become a nation that only thinks about rights – remember that for every right there is also a responsibility. The system of grants and pensions was planned to help the needy, but somehow people now would rather receive grants than do an honest day's work.

JAN DE VILLIERS, A RETIRED FARMER

The importance of buying good certified seed

IF YOU LOOK CLOSELY AT THE PICTURE OF THE ALMOST RIPE WHEAT, YOU WILL REALISE THAT THIS FARMER HAD A HUGE PROBLEM. THERE ARE AT LEAST TWO DIFFERENT VARIETIES OF WHEAT PLANTED IN THIS LAND – THE ONE IS ALMOST RIPE WHEREAS THE OTHER IS STILL GREEN.

This causes a dilemma – if you try to harvest the wheat when the first variety is ripe, the green wheat (unripe) is ground to a paste which stops the machine from threshing the grain. If you wait for the later wheat to ripen, the faster variety will have fallen out onto the ground and you will lose it anyway.

This is just an illustration of the importance of buying good certified seed – you must know what you are buying, otherwise your management may become a crisis!

JANE MCPHERSON, PROGRAMME MANAGER OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

Different varieties of wheat planted in the same land.

This special feature is made possible by the contribution of the Winter Cereals Trust.

Know the nutrient status of your soil

The different colours on the maize leaves indicate nutrient deficiencies.

Look at the photo of the maize leaves – you can see many different colours – these are nutrient deficiencies. When you are planning to plant a crop on a certain land, we always encourage you to take soil samples so that you can know the nutrient status of your soil.

The soil in which this maize was planted had deficiencies and it is clear from the photo that the correct fertiliser was not applied. The leaves should be a uniform, dark green colour.

Nitrogen (N)

- Nitrogen is an essential part of organic matter.
- Nitrogen is essential for the life and growth processes and promotes:
  - The green colour of the plant;
  - Leaf and stem growth;
  - Quality of the leaf crops; and
  - Grain formation.

Phosphorus (P)

- Phosphorus is an essential plant of organic material.
- Phosphorus is essential for the life and growth processes and promotes:
  - Early root development;
  - Hastening of crop maturity;
  - Seed formation; and
  - New cell formation – that is actual growth.

Potassium (K)

- Potassium is to be found mostly in the vegetative parts of plants and especially in areas where growth is taking place in stems.
- Potassium Phosphorus is essential for the life and growth processes and promotes:
  - Crop quality;
  - Strong stalks;
  - Vigorous growth;
  - Grain formation;
  - Resistance to disease, cold and drought; and
  - Water utilisation.

JANE MCPHERSON, PROGRAMME MANAGER OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

Scouting for the stalk borer enemy

On this page are two photos showing the stalk borer in maize. These photos are just to remind you to scout for this little enemy.

This worm can do serious damage in you maize and you should be on the lookout for it – usually from January each year. The months come in "waves" and quite often you will have more than one infestation during the season.

Many people are using the maize seed that has BT in its name – this seed has been specially developed to offer resistance to stalk borer – the worms cannot live if they eat this type of maize. Although the seed is considerably more expensive, it is well worth while to use it as you may save your crop.

A close up of the stalk borer in maize.

JANE MCPHERSON, PROGRAMME MANAGER OF THE GRAIN SA FARMER DEVELOPMENT PROGRAMME

On radio

Do not miss these interesting programmes on radio, which covers issues of interest for developing farmers.

Radio	Weekday	Presented by	Time
Radio Qwaqwa	Thursday	Johan Kriel	19:00 - 20:00
Radio Mafikeng	Thursday	Tonie Loots	19:30
Zululand FM	Saturday	Jurie Mentz	06:10
Ligwalagwala FM	Thursday	Jerry Mthombothi	05:10
Umhlobo Wenene FM	Tuesday	Lawrence Luthango	04:30
Alfred Nzo FM	Monday	Ian Household	19:00 - 20:00

A functional gauge could save you thousands

If you need to know more about the engine, the temperature gauge, the cooling system or the thermostat of your tractor, this article will give you more information to do just that.

The engine

An engine is a related group of parts assembled in a specific order. In operation it is designed to convert the energy given off by burning fuel into a useful form. There are many parts in a modern engine each one being essential to the engine operation.

For the time being, however, we may think of an engine as a device that allows us to pour fuel into one end and get power from the other. The fuel burns under pressure and as we all know, when something burns, it gives off heat.

Internal combustion means burning within, thus an internal combustion engine is one that burns fuels internally. Basically this engine is a container in which we put fuel and air and start them burning. The mixture expands rapidly while burning and pushes outward. This push can be used to move a part of the engine and transmitted to drive the machine. In summary an engine is a device which converts heat energy into mechanical energy to do the work.

The temperature gauge

The temperature gauge measures the temperature of the engine. If the engine starts to overheat, damage can be done to the engine. If you see that the temperature is going up, you must take action immediately and stop the tractor before damage is done to the engine.

In the field we see many temperature gauges that are not working – this is very dangerous for your tractor because if the gauge is not working, you will not know if the engine is overheating and you may ruin the engine. This could cost in the region of R50 000 to repair. These temperature gauges are available at motor shops and it is very wise to replace a temperature gauge that is not working – this could save you thousands of rands.

The cooling system

The cooling system on a tractor does two things:

1. It prevents overheating of the engine; and
2. It regulates temperatures at best levels.

Overheating could burn up engine parts in a short time. Some heat is needed for combustion, but the working engine generates too much heat. So the cooling system must carry off the excess heat. Regulating temperatures keeps the engine at the best heat level for good combustion during each operation. After starting, the engine must be warmed up as fast as possible.

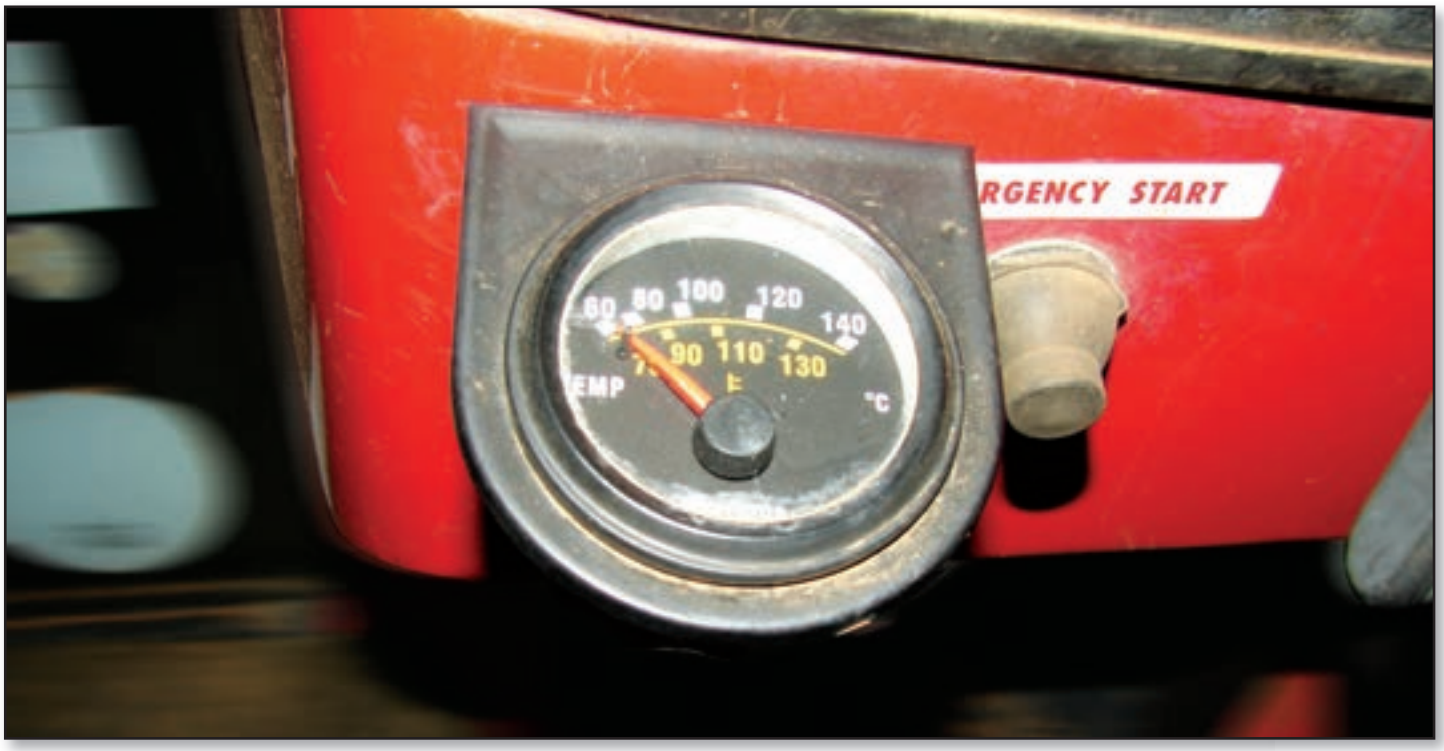
Types of cooling systems

Two types of cooling systems are used on modern engines:

- Air cooling – uses air passing around the engine to dissipate heat.
- Liquid cooling – uses water around the engine die dissipate heat.

Air cooling is used primarily on small engines or aircraft as it is difficult to route air to all the heat points of larger engines. Metal baffles, ducts and blowers are used to aid in distributing air.

Liquid cooling normally uses water as a coolant. In cold weather, antifreeze solutions are added to the water to prevent freezing. The water circulates in a jacket around the cylinders and cylinder head. As heat radiates it is absorbed by the water, which then flows to the radiator. Air flow through the radiator, cools the water and dissipates heat into the air. The water then recirculates into the engine to pick up more heat.



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GRAIN SA
PO Box 88, Bothaville, 9660
(056) 515-2145
www.grainsa.co.za

PROGRAMME MANAGER
Jane McPherson
082 854 7171

MANAGER: TRAINING & DEVELOPMENT
Willie Kotzé
082 535 5250

SPECIALIST: FIELD SERVICES
Danie van den Berg
071 675 5497

DISTRIBUTION: PULA-IMVULA
Debbie Boshoff
(056) 515-0947

PROVINCIAL CO-ORDINATORS
Daan Bosman
Mpumalanga (Bronkhorstspruit)
082 579 1124

Johan Kriel
Free State (Ladybrand)
079 497 4294

Tonie Loots
North West (Zeerust)
083 702 1265

Jerry Mthombothi
Mpumalanga (Nelspruit)
084 604 0549

Lawrence Luthango
Eastern Cape (Mthatha)
083 389 7308

Jurie Mentz
KwaZulu-Natal and Mpumalanga
082 354 5749

Ian Household
Eastern Cape (Kokstad)
078 791 1004

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Our aim is to produce the best publication possible. Please direct any comments on the editorial content or presentation thereof, to Jane McPherson.

A functional gauge could save you thousands

Liquid cooling systems

A liquid system may consist of the following:

- Radiator and pressure cap.
- Fan and fan belt.
- Water pump.
- Engine water jacket.
- Thermostat.
- Engine oil cooler.
- Connecting houses.
- Liquid or coolant.

The radiator is one of the major components of any liquid cooling system. It is here that heat in the coolant is released to the atmosphere. It also provides a reservoir for enough liquid to operate the cooling system efficiently.

Water pump

The water pump circulates the coolant through the system. The pump draws hot coolant from the engine block and forces it through the radiator for cooling. Some engines have distribution tubes and some have transfer holes which direct extra coolant flow to "hot" areas, such as exhaust valves seats. The water pump is normally a centrifugal type and might be called the "heart" of the cooling system. When the pump fails to circulate the coolant, heat is not removed from the engine and overheating damage may occur.

The thermostat

The thermostat is a heat operated valve. It controls the flow of coolant to the radiator to maintain the correct operating temperatures. The thermostat provides automatic control of the engine temperature at the correct level. This is necessary in order to get the best performance from an engine.

Some larger engines use dual thermostats for temperature control. The function and operation is the same as for a single thermostat system but allows for more capacity. Only a small part of engines cooling capacity is required under the light loads, even during warm weather.

During warm-up the thermostat remains closed. The water pump circulates coolant through the engine water jacket only, by way of the bypass.

The engine quickly warms up to its operating temperature before the thermostat opens. When the thermostat opens, hot coolant flows from the engine to the radiator and back.

Coolant

Coolant is the liquid that circulates through the cooling system carrying heat form the engine water jacket into the radiator for transfer to the outside air. The coolant then flows back through the engine to absorb more heat.

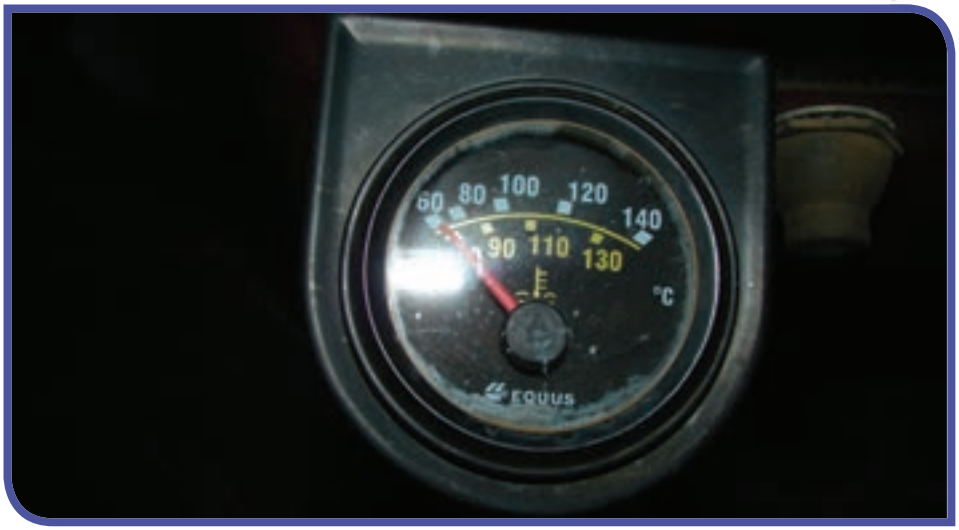
Servicing the cooling system

Correct cooling system servicing is vital for a smooth-running engine.

Overheating is a big danger and can be caused by:

- Clogging of the cooling system;
- Lack of coolant; and
- Defective water pump or thermostat.

Check the coolant level and temperature frequently. Service the entire coolant system at least twice a year. Efficient operation of the cooling system requires an occasional cleaning, particularly at seasonal changes when antifreeze solution is added or removed.



Temperature gauges that are not working properly can damage the engine of your tractor.

INFORMATION OBTAINED FROM THE GRAIN SA TRACTOR AND FARM IMPLEMENT MAINTENANCE COURSE