



EFFECTIVE LAND PREPS:
The Dos and don'ts

From drought to rain—managing the transition **41**

Producing the 'white gold' **6**

Pen-fattening: Where is the money? **71**

Common livestock diseases **161**



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EFFECTIVE LAND PREPS:

The Dos and don'ts



Rutendo Nhonghema

DURING this period of transitioning from a particularly dry 2023/24 season to a new one, farmers find themselves at varying stages of preparation. And given the seasonal forecast of a slow and delayed start followed by increased rainfall in the last half, farmers face the crucial and daunting question of how best to proceed under the circumstances.

The crux of the matter is that farmers may not be sure whether to wait for confirmation of increased rainfall activity before taking action or consider taking proactive steps, if any, to navigate the changing weather conditions ahead. The best option they can take is to go ahead with preparations in terms of readying the land, adopting a nutrient management plan, crop protection plan as well as securing resources.

Land preparation is one of the key steps that farmers must always get right for increased productivity. By now a farmer should have made a decision on whether he is going to use conventional tillage (ploughing, discing and many others) or reduced tillage commonly known as no till or zero tillage. Those using conventional tillage are expected to have done land preparation soon after harvesting (commonly referred to as winter ploughing). Facts for winter ploughing:

1. The ground will be soft due to residual moisture from the previous season and hence easier to achieve the required depth of more than 250mm.
2. This helps in locking up moisture making planting easier the following season.
3. To give the ploughed in crop residue time to decompose and add fertility for new crop.

Currently, the ground is very dry in most places unless a farmer had an irrigated winter crop. Farmers are not likely to get the required planting depth if they come in with a plough or disc, hence the need to do conservation or zero tillage. Poor land preparation may restrict root growth, promote poor weed control and compromise productivity. Farmers can direct seed either into fallow land or into wheat residue, which then acts as mulch for moisture conservation and weed control. If ploughing into wheat residue, farmers can do an initial application of 50-75kg/ha Ammonium Nitrate (AN). This is especially important this season when the season is expected to start late, which requires farmers to plant as soon as they receive effective rains and use moisture conservation techniques to sustain the crop till the season sets in.

Another important fact to consider going into the season is nutrient management. A farmer must have a nutrient management plan, which is specific for his soil, the crop he wants to grow as well as his water management plan. Nutrient management goes beyond just buying and applying fertilisers but also includes issues such as soil pH status taking into cognisance the 'R's of nutrient management — Right source and Right quantity. This entails increasing nutrient efficiency rather than quantity of nutrients.



In this regard, soil pH becomes an important parameter to consider. If soil pH is not optimum, most nutrients are unavailable to the plant, hence efficient uptake of nutrients and the subsequent yields are compromised. The idea is to ensure all nutrients applied in form of fertilisers end up in the harvest and not in the environment.

Nutrient uptake and yield are mutually dependent on the amount of nutrients that a crop needs to achieve maximum yields. Of course other forms of yields, for instance, field yield and marketable yield are not only determined by nutrients supplied but other factors such as moisture management, crop protection. Stresses caused by water scarcity and diseases reduce the amount of nutrients a crop will take up. Adding more nutrients will not compensate for yield losses due to these factors.

Economics play an important role when choosing a nutrient management plan. Applying more fertiliser than the required will reduce profit and increase pollution while applying too little will reduce yield and the subsequent profits. Each crop requires a different fertiliser type and application rate for the best financial returns depending on cost of fertiliser, responsiveness of the crop to fertiliser and other factors such as water management practices. Farmers must always remember the law of diminishing returns and aim for a point of stability where an increase in fertiliser rates will not lead to a corresponding increase in yields. There is an ideal amount of fertiliser farmers should apply (optimum rate rather than maximum rate). It is a critical calculation, which is determined over time through experience and skill acquisition.

Critical points to note in nutrient management are

- Apply fertiliser to achieve an identifiable objective rather than routine (which mostly is a known nutrient deficiency).
- Always prepare a management plan, which

talks to what type of fertiliser to be used (blended, straight, liquid or compounds), how much to use (informed by soil tests), when and where and how to apply the fertiliser.

- Consider the environment. If not used properly, can be a pollutant.

Another important point is crop protection, which basically covers weed, pest and disease control.

Weeds are one of the leading causes of low yields in crop production especially among smallholder farmers who end up spending more time doing manual weeding at the expense of other activities due to poor weed management strategies. Weeds account for over 50 percent yield losses if not controlled in the first three weeks of crop establishment for some crops hence the need for farmers to have a weed management plan to avoid such losses.

A weed management plan must integrate a combination of weed control methods from cultural, chemical to physical control and where possible, biological control, for improved effectiveness, sustainability as well as environmental considerations.

Cultural methods may include tillage where deep ploughing a couple of times followed by discing can be done to either bury weed seed beyond germinating depths or expose weed seed to harsh environmental conditions. Playing around with plant populations and achieving optimum populations can also be done so that the crop quickly develops a canopy that smothers weeds. Ensuring that weeds never flower in the field is another strategy that can drastically reduce weed pressure.

Chemical control is fast and convenient way of managing weeds. Herbicides are broadly categorised into pre-emergence and post-emergence. Pre-emergence herbicides are generally cheaper though they require a higher level of planning. Post-emergence herbicides are more expen-

sive and must be selective. High levels of weed control are achieved by using a combination of both pre and post emergence herbicides applied at the right time and at the right frequency. It is important to have an understanding of problematic weeds in your area as these inform the weed management strategy.

Knowledge of the weed spectrum is important given that some weeds, such as star grass, have no known or limited herbicides that control them post-emergence in maize. Farmers must always ensure that the herbicide that they are using is registered for that particular crop to avoid yield losses. Before using herbicides, knowledge of their residual effects and their impact on rotation is also a must.

Herbicides with long residual action can affect crops grown afterwards, for example, atrazine that is used in maize may have residual effects of 12-18 months after being applied on crops such as beans, pumpkins and tomatoes. Farmers are encouraged to consider their rotations before applying herbicides. It is important to note that water is very critical for activating weed control especially in pre-emergence herbicides. After applying a pre-emergence herbicide, a light irrigation of 10-20 mm is required within 4 days of application.

Too much water or rain soon after may wash away the herbicide. Post-emergence herbicides, in contrast, require a rain free or rain fast period, which usually ranges from 8-24 hours after application depending on the herbicide. It is discouraged to apply herbicides on weeds suffering from moisture stress or under drought conditions, as they will not be able to take up the herbicide. Crop protection is also key in terms of disease and pest management. Farmers must seek advice from their extension workers.

The author is the chief agronomist in the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development

Land preps, planting and fertilisation requirements

P. Klein and A. Zaid Date

I. Land preparation

THE purpose of land preparation is to provide the necessary soil conditions which will enhance the successful establishment of the young offshoots or the tissue culture plants received from the nursery. Considering the nature of the date palm, one can not "save" on this operation and hope for long term sustainability of the plantation.

The aim is to enable the date grower to plan and structure the implementation process in advance, ensuring the successful establishment of the date plantation. Planning forms part of the initial preparation and will help to limiting unnecessary stoppages during the implementation phase.

Critical factors to consider during this planning exercise are summarised as follows:

- Availability and quality of irrigation water;
- Field selection;
- Mechanical actions to be implemented;
- Chemical needs for pre-plant soil improvement;
- Tools and equipment needed for date cultivation;
- Labour needs;
- Irrigation design and installation;
- Leaching schedule;
- Hole preparation;
- Financial requirements and
- Time schedule.

1. Field selection

The area selected for the establishment of the date plantation can influence the cost of land preparation to the extent that it may not be viable to proceed with the development at all.

The authors' aim is to highlight the critical areas to be considered when selecting the land for the establishment of a new date plantation.

1.1 Availability of water

Although not always realised, the date palm requires a rather large quantity of water for sustainable growth. Critical factors regarding water for irrigation purposes are:

- the sustainability of the water source,
- the quantity of water available for irrigation,
- the distance to the field, and



- the quality of the water.

1.2 Soil depth

In time date palms grow very tall and become top heavy especially during the fruit bearing stage.

They therefore need sufficient room for proper root development to support the palms.

Besides the importance of root development, soil depth also influences drainage and leaching possibilities. Any obstructive layers must be evaluated to determine whether they will influence root development and whether they can be corrected.

1.3 Soil quality

Date palms can grow and produce in different types of soil in both hot arid and semi-arid regions. Adaptation could go from a very sandy to a heavy clay soil.

The soil quality is related to its drainage capacity mainly when soils are salty or the irrigation water is characterised with a high salt content. Sandy soils are common in most date plantations of the old world.

Rare cases of clay soils (i.e. Basra-Iraq) with drainage systems are found allowing the culture of date palms. The optimum soil conditions are found where water can penetrate to at least 2m deep.

When evaluating the soil quality, attention must be given to:

- the soil texture which will influence the water retention capacity, and
- the nutrient content to determine the corrective measures necessary for soil improvement.

1.4 Soil salinity or acidity

Plant growth is influenced by either saline or acid soil conditions which, in the end, will result in a loss of potential yield.

Saline and alkaline soils are common in date plantations and are characterised by a high concentration of soluble salts, and exchangeable sodium, respectively.

Soluble salts present in these soils belong to cations: sodium, calcium and magnesium and to chloride and sulphate anions.

Saline soils have an electric conductivity (EC) of their saturated extract higher than 4 mmhos/cm at 25°C, with a sodium absorption rate less than 15 and a pH generally less than 8.5. Saline soils can be recognised by the presence of a white layer on the surface of the soil resulting from the high salt concentration which may harm the growth and development of date palm.

Alkaline soils are characterised by an EC of their saturated extract less than 4 mmhos/cm at 25°C with a sodium absorption rate higher than 15, and a pH higher than 8.5. Alkaline soils do contain harmful quantities of alkalis with the hydroxyl group — OH, especially NaOH. These types of soil are usually difficult to correct coupled with a low production resulting from low content of calcium and nitrogen.

However, it is recommended to eliminate the excess of sodium by the addition of acidifying agents (gypsum, sulphate of iron or sulphur).

Saline and alkaline soils are usually the result of:

- an increase of the underground level caused by excessive drought situations (high evaporation);
- the use of high salt content water, and
- very poor drainage system.

Where date palm grows in climates of little rain, but great heat and much evaporation, irrigation or flood water evaporates quickly, and its salts are left on the surface of the soil.

The negative influence of saline conditions are:

- high concentration of soluble salts;
- high soil pH;
- poor drainage and aeration; and
- the negative effect of sodium on the plant metabolism.

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Editor's Note



LATEST weather projections seem to be suggesting that a weak La Niña state is likely for the 2024/25 summer season – a state that is generally associated with cooler and wetter summer seasons.

And given these weak signals, the climate models are not confident in their forecasts and hence it is unclear whether the early summer months are likely to be wetter or drier than average. However, the September forecasts are more confident of the likelihood of

a wetter-than-average mid-summer period from December to February.

I know this kind of situation will easily send mixed signals out there, and justifiably, some of you may even be caught napping and unprepared when the season finally sets in. Such a scenario will be very unfortunate for you as a farmer. You must always make sure you are ready for the season and waiting for the first effective rains or even have a portion under dry planting.

This will give you a head-start when the rains eventually hit your shores. I am sure you are aware that the astute farmer does not observe a stone that is about to strike her without ducking or blocking it. You have to find ways of fitting into the prevailing weather pattern lest your season fails dismally.

It is true that in some cases farmers aggravate the impact of a bad season because of their lack of innovativeness. Yes, a season may be bad but there is always a way of trying to cope and make the impact less painful. If rains are coming late, why not do all the preparations and wait fully prepared to spring into action with the first drop of the rains. Leaving everything to fate has always been most farmers' biggest undoing during bad seasons.

That talk about turning lemons into lemonade is not always in vain. Most difficult situations have a silver lining somewhere and farmers should search for it and find it. I know farmers do not have realistic chances of beating a drought if they do not have irrigation facilities but they can always play around with factors such as timeliness, correct crop variety selections and disposing a few assets to save the bulk especially for those doing livestock. It is an undisputed fact that most of you do not feel comfortable selling some of your cattle to save the entire herd during a state of disaster but such a move has always paid off for those who tried it.

Some of you keep assets like cattle for sentimental reasons but that does not make much business sense in the event of disasters like droughts, which indiscriminately crash everything in their path. For cropping options, droughts obviously require you to grow crops that are tolerant to harsh conditions so you have to temporarily abandon your traditional crop choices and deal with the emergency.

Until then, enjoy!!!



Covering water pan, collecting water with gutters, and storing water in tanks

From drought to rain – making the most of changing weather on your farm

PROLONGED periods of drought and then sudden downpours of rain are becoming increasingly common weather patterns around the globe. Where there used to be a more consistent and steady flow of the changing seasons, we are now experiencing more extremes on both ends of the scale.

Extremes in weather cause challenges for all ecosystems. Plants and animals are having to get used to drought conditions, then sudden flood conditions as well as fluctuations in temperature. On our farms, going from drought to rains can cause havoc to our soils with heavy rains unable to percolate into the parched ground resulting in soil erosion, crop damage and flash flooding.

A professor from the University of Reading in the UK demonstrated how water soaks into the ground in different conditions. It really shows how 'heatwave' drought conditions seriously affect how the water gets into the ground. If water cannot penetrate the soil it will result in more overland flow which can lead to flooding especially if the rains are heavy.

Unfortunately, with climate change, these extreme conditions are going to become more common so we will have to adapt our farming practices to make the most efficient use of the water when it comes.

Why does soil lose its water holding capacity?

Soil retains water by holding it in its pores — the number and size of pores is dependent on the soil type. For example, water is held more tightly in the fine particles of a clay soil or within organic matter, whereas sandy soils have coarse particles that water runs through more readily.

When we experience drought conditions, even a soil with good water retention properties struggles. As the soil dries out the pores in the soil shrink and it can become compressed and cracked.

Ideally the rain we would receive after a dry period would be slow and steady, gradually dampening the

soil and increasing its water holding capacity. However, due to extreme heat it is common to experience thunderstorms and heavy rain following drought — the worst combination.

Sudden rainfall will likely run-off over the surface of the soil (especially on sloped land) or divert down the cracks in the soil leaving large areas of soil without water.

Things you can do to increase the water holding capacity of your land

There are a few things you can do on your plot when rain is imminent, add organic mulch around your plants such as grass cuttings, compost or woodchip. This will help to trap water around the base of your plants and give it some time to percolate into the soil. The more water you can get into the soil, the better it will be at retaining further rainfall.

Offcuts from previous crops used as mulch

If you have open patches of ground with grass or similar crops on them, you can gently spike the earth to create more holes in the ground for water to run into rather than running over the surface.

Dig furrows around your plants or rows of crops to catch water instead of it running off straight away — do be careful not to damage the roots of your plants in the process as they are already in stress. Get some seeds into the ground ready to be watered in by the coming rainfall, this will save you having to water them in — plants like lettuce or spinach are great for this as they are fairly fast growing and prefer the cool weather after rain.

Preparing for drought in future years

The best way to improve the water retention of your soil in coming years is to increase the organic matter in your soil and the soil diversity. Plant a range of crops and avoid a monoculture. Also plan to rotate your crops around your farm each year.

Where possible don't leave ground bare, look into planting cover crops that can help to shade your soil, retain water and provide nutrients for the

land while it is not under food crop. This also helps your soil to not become compacted by people or animals walking on it — anything you can do to reduce soil compaction will help with reducing surface runoff.

You can also plant specific ground cover plants around your vegetables such as clovers, these have the same effect of helping to improve soil structure and water retention, but also help to reduce evaporation when there is at least some rain. Leaf cover also helps keep soil cool — most vegetables like to grow in soils at 20-25 degrees celsius, but dark compost soils can quickly retain heat and reach temperatures of double this. Plant roots and soil microbes alike struggle to survive in this environment.

Other things to do to make the most of rainfall

Everyone growing produce should be collecting rainwater to store as reserves for dry periods. During a drought is a great time to make sure that these are in good condition, that gutters leading to water butts or tanks are clear and there are no blockages stopping water from reaching your storage areas. If you have impermeable pathways on your land you can also look into diverting runoff from these into the ground or a downhill storage area.

Look for other containers that can be placed outside to capture rainwater, fill your watering cans with water from your storage tanks to ensure that you can capture as much as possible in them when the rain falls.

Irrigation from harvested rainwater

Once you have a good collection of rainwater on your farm you will be better prepared to get through future droughts. Tips for irrigating effectively are much like making the most of the rain. You want to make sure that you are irrigating slowly and gently to as close to the base of your plants as possible. This will ensure that the water you are adding to the land does not simply run off taking soil and nutrients with it.

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MAIZE PRODUCTION



Maize field

Regions (NR)

Variety classification	Days to Maturity	Suitable NR
a) Short season		
Ultra Early	90 - 120	III and IV
Very Early	115 - 127	III and IV
Early	127 - 140	III and IV
b) Medium season	130 - 146	II and III

c) Long season	140 - 170	I and II
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- Irrigate in NR III to V for commercial production.
- Short to medium season varieties can be grown in high rainfall areas if planting is delayed or soils have low moisture holding capacity.
- Popcorn varieties are available with maturity ranges of 90 to 110-days or later.

• To Page 12



PRESS STATEMENT

RESERVE BANK OF ZIMBABWE'S PARTICIPATION IN THE FOREIGN EXCHANGE MARKET TO CONSOLIDATE ZiG STABILITY

During the past three weeks of October 2024, the Reserve Bank has injected about US\$32 million into the interbank foreign exchange market to smoothen the mismatches between supply and demand. Traditionally, the last quarter of the year witnesses increased demand for foreign exchange to meet critical requirements for the summer agricultural season and for preparations for the start of the festive period.

In line with the recent monetary policy measures issued by the Monetary Policy Committee (MPC) on 27 September 2024, we have witnessed a satisfactory increase in the willing-buyer-willing-seller (WBWS) foreign exchange trading activities. Holders of foreign exchange, including exporters, have been selling their foreign currency in exchange for ZiG to fund their tax obligations and other payments denominated in local currency. However, with the end of the tobacco selling season, we have noticed a slowdown in the supply of foreign exchange to the WBWS interbank market and an increase in pipeline demand.

Over the past three weeks, foreign currency pipeline demand has averaged US\$15 million, and the Reserve Bank has been intervening in a timely manner to address the supply/demand mismatches. The pipeline demand for this week has risen to US\$25 million due to increased pressures to fund the 2024/2025 agricultural season requirements. Consequently, on 24 October 2024, the Reserve Bank offered a market-clearing foreign currency sale of \$25 million, and the market could only take up about US\$19 million because prospective buyers of foreign currency did not have enough ZiG liquidity to purchase available foreign currency. The recent market intervention has brought the cumulative participation of the Reserve Bank in the WBWS market to US\$50 million in October 2024 alone.

The Reserve Bank will continue with its tight monetary policy stance and ensure that reserve money is fully backed at all times.

I thank you.

John Mushayavanhu
GOVERNOR
25 October 2024

Brief background

- Maize is the most important grain crop in Zimbabwe as it is the staple food crop. It is grown for both subsistence and income generation.
- Successful maize production greatly depends on manipulation of the environment and crop growth.
- Maize is a warm weather crop which cannot stand frost at any stage in its growth.
- It is mainly grown in the hot summer months of September to April in most areas of the country although in the hot lowveld areas it can also be grown in winter. Winter production is possible under irrigation in low-lying frost-free areas with generally low yields.
- Optimum temperature range for maize growth and development is between 18 and 32 degrees Celsius. High temperatures (above 38 degrees Celsius) at tasselling and silking cause crop failure due to poor pollination. Irrigate the crop at that stage.

Moisture

- Maize requires a stretch of 110-140 days of evenly spread moisture, which must be at least 500 mm.
- It can withstand some moisture stress early in its vegetative growth but any moisture stress after about five weeks will certainly result in yield losses.
- Moisture is particularly necessary during the tasselling and silking stage. If moisture stress coincides with this stage, crop failure becomes imminent due to poor pollination. Moisture deficiencies at this stage reduce yields by about 7 percent per day.
- Maize cannot thrive under water-logged conditions. Prolonged water-logging has negative effects on the growth and development of the crop.

Variety selection

- The criteria used are numerous but some of the major ones are; variety type, cost of inputs, maturity class, yield potential, drought tolerance and disease resistance.
- A variety can either be a hybrid or an open pollinated variety (OPV). Maize varieties can also be classified as white, yellow or orange depending on grain colour.
- White varieties are preferred for mealie meal whilst yellow and orange varieties are preferred for roasting and for live-stock feed.

Hybrids: cannot recycle seed at all

- A hybrid is a cross between parents that are genetically different.
- The seed of these varieties cannot be recycled at all. New seed must be purchased every season.
- The hybrids are divided into three categories based on days to maturity, Long season, medium season and short season.
- The short season varieties have three categories: Ultra Early, Very Early and Early

Hybrid Variety Characteristics and Suitable Natural

Producing 'white gold'

Background

Cotton is the most widely grown cash crop in Zimbabwe's Middleveld and Lowveld areas. The Middleveld and Lowveld constitute about 63 percent of the land area of Zimbabwe. The history of commercial cotton production in Zimbabwe which dates back to 1923 was generally characterized by years of remarkable expansion and growth which was motivated by substantial producer prices and robust government driven research, input support system, extension, and marketing support services.

Varieties

CRI MS 1, CRI MS 2, and SZ9314 are the varieties that are being grown in most of the cotton growing areas.

Response of Cotton Varieties to Biotic Stress

Tolerance to Pests and Diseases	Albar SZ 9314	LS 9219	CRI-MS 1	CRI-MS 2
Jassids	Fair	Good	Good	Good
Aphids	Fair	Good	Good	Good
Bacterial blight	Good	Good	Fair to good	Good
Verticillium wilt	Poor	Poor	Very good	Fair

Fibre Quality Parameters

Key fibre attribute	Albar SZ 9314	LS 9219	CRI-MS 1	CRI-MS 2
Lint out-turn (%)	> 40	35-36	40-43	41-43
Length (mm)	28-29.5	30-32	28-29.6	28-29.6
Strength (HVI, g/tex)	31.5-32.6	31.68	30.9-33	31.3-33.3
Micronaire	4.2	4.2	4.3	4.35
Maturity (%)	96.100	95-100	>85	>85
Uniformity (%)	>86	>85	>80	>80
Elongation (%)	7	7	7	7
Whiteness (%)	78	78	78	77

Climatic and Soil Requirements

- Growing season of 180 frost-free days (6-7 months).
- High temperatures, long sunshine hours and an average rainfall of 600-700mm.
- Grown in altitudes of below 1200m.
- Require well drained, fertile soils with a high water holding capacity and unrestricted depth.
- Optimal pH 5.3-5.5

Planting and Spacing

- Earliest planting dates controlled by legislation for control of pink bollworm.
- Earliest dates are 5 and 20 October for the south-east Lowveld and the remainder of the country respectively.
- Inter-row and intra-row spacing of 100 cm and 30 cm respectively.
- Under marginal growing conditions, the inter-row and intra-row spacing 90 cm and 20 cm respectively.

Seed rate

- 15-20 kg/ha on light soils and 25kg/ha on heavy soil.
- Place 3-5 seeds together in the planting hole and cover to a depth of 20 mm.

Gap filling

- Gap filling within 3 to 5 days after emergence.

Thinning

- To be done 5 days after emergence and complete within 3 weeks after emergence.

Fertiliser Requirements	Good soil	Medium soil	Poor soil
N Lowveld Irrigated	80kg/ha	100kg/ha	150kg/ha
N Middle veld Irrigated	60kg/ha	80kg/ha	100kg/ha
N Middle veld Dry land	40kg/ha	60kg/ha	80kg/ha
P205 Irrigated			
Dryland	40kg/ha		
20kg/ha	60kg/ha		
40kg/ha	80kg/ha		
60kg/ha			
K20 Irrigated			
Dryland	40kg/ha		
60kg/ha	40kg/ha		
30kg/ha	80kg/ha		
60kg/ha			

Attributes of Some Current Zimbabwean Commercial Cotton Varieties

Key Attribute	Albar SZ 9314	LS 9219	CRI-MS 1	CRI-MS 2
Staple category	Medium	Long	Medium	Medium
Altitude (m)	200-1150 (Middleveld and Lowveld)	600-1200 (High Input Management)	200-1500 (Middleveld and Lowveld)	200-1500 (Middleveld and Lowveld)
Dryland/Irrigation	Both	Both	Both	Both
Yield Potential (kg/ha)	2000	2000	2600	2300
Dryland /Irrigated	4000	3500	4300	4200
Preferred spacing	0.3m x 1m	0.3m x 1m	0.3m x 1m	0.3m x 1m
Plant growth habit	Indeterminate	Indeterminate	Determinate	Determinate
Boll size	>5.5g	5-6g	5-5.5g	>5.5g
Seed size	Large	Medium	Small	Small
Earliness	Late maturity	Medium to late maturity	Early maturity	Medium to late maturity



Common name: Cotton
Scientific name: Gossypium spp.
Shona name: Donje
Ndebele name: Utshinda

Cotton field

Apply top dressing as a single dressing or split at 4 weeks and 8 weeks after planting.

Amounts of fertiliser		
Fertiliser	Rate (kg/ha)	Timing
Compound L	200 (good soil)	Before planting
	300 (medium soil)	4 and 8 weeks after planting
AN	100 (good soil)	
	150 (medium soil)	

Weeds, Disease, Pest and Control (See the IPM/IPPM, chemical control sections).

Weed Control

- Must be kept weed-free during the critical growth stages:
- First 8 weeks after crop emergence and at flowering.
- During the picking stage.

The 3 methods for weed control are:

- Hand hoeing
- Mechanical methods
- Herbicides (Pre-planting, pre-emergence and post emergence)

Cotton legislation

Successful cotton pest management requires strict compliance with Plant Pests and Diseases Act [Chapter 19:08] and proper application of management regulations and recommendations. The regulations and recommendations include the acaricide rotation scheme, the pyrethroid window, the use of pesticides from reputable suppliers, and use of non-expired pesticides. Plant Pests and Diseases (Cotton), (Amendment) Regulations enforces the creation of a "dead period" (or "closed season") by cotton growers during which all cotton plants and/or stalks are destroyed so as to prevent Pink bollworm (*Pectinophora gossypiella*) population build up and carry over. The closed season ensures that no living cotton plants are allowed for at least 66 days implemented by legal cotton destruction and planting dates as shown below:

Cotton slashing, destruction and planting dates			
Area	Slashing date	Destruction Date	Planting Date
South East Lowveld	01 August	15 August	05 October

Remainder of Country	15 August	10 September	20 October

NB. All applications for an extension of the cropping season should be submitted to the Research Services Division of the Department of Research and Specialist Services at least 3 weeks prior to the stipulated destruction date.

Pest Control

Scouting is the nexus of pest management. Application of control tools is based on economic threshold levels which vary from pest to pest. Pesticide use should be based on either the acaricide rotations scheme or pyrethroid window.

Major Cotton Diseases in Zimbabwe

Bacterial Blight, Verticillium wilt, Fusarium wilt, and, seedling diseases. Control is mainly through good cultural practices.

Harvesting

- The boll is ready for picking when the lint has fluffed out and feels dry against the face.
- Cotton must never be picked and packed when it is wet.
- If picking is delayed the fibre loses lustre, strength and silkness.
- When seed cotton is over exposed to sun it gets a harsh appearance resulting in downgrading by buyers and less revenue to the grower.
- DO NOT PICK IMMATURE COTTON. It has weak fibre and discolours easily.
- Adequate picking bags of the correct type must be provided to all pickers. Polythene fertilizer bags are cheap and ideal for tying round the pickers' waist provided they are clean.

Yield levels

Government of Zimbabwe bred cotton varieties can achieve 4 tonnes per hectare when provided with a conducive growing environment. A 20-year average yield in Zimbabwe was 0.7t/ha.

Marketing

- The growers should be registered with buyers/contractors by end of October of each year.
- Sell to registered buyers or contractors.

Source: Ministry of Lands, Agriculture, Fisheries, Water and Rural Development; Field and Horticulture Crops Handbook for Farmers

Where is the Money? (Part 2)



Eddington Gororo

In the first part of this article, we explored the major cost items in a feedlot and how to contain them. In this final part, we analyse the revenue streams, key margins and how to maximise returns.

1. Introduction

In a feedlot, one makes money out of selling more kilograms of premium quality, high priced meat. Hence the objective for putting animals through a feedlot could be to: add extra weight to them; improve their carcass grades; finish them for the market at a younger age; and take advantage of seasonal price and demand peaks. The slaughter value of a pen finished animal is determined by carcass weight, grade and price.

2. Revenue streams

A feedlot must profit from the difference between the purchase and slaughter weights of the animal. From the time that an animal is put in the feedlot, it must gain an average of 1.5 kg/day in live weight. A steer inducted at 260 kg would produce a 400 kg slaughter animal in a 90-day feeding period – that is, +75 kg more cold dressed mass (CDM) to sell.

Fattening improves the degree of fatness and fleshiness (finish) of the carcass in order to achieve higher grades and better prices. Price offered per kilogram of beef (CDM) sold would depend on grade into which the carcass is classified. The feedlot manager must have knowledge of how carcasses are graded, and pick the kind of animal that would produce premium carcass grades.

There are large differentials in prices offered to farmers for different grades of meat. In addition, these prices fluctuate with season and from one slaughter house to another, as shown in Tables 1 and 2. Thus, the factors season, abattoir and grade will make a big difference to the returns of a feedlot enterprise. The ultimate aim should be to get each fattened animal into the super grade.

Table 1. Producer prices (US\$/kg CDM) for different carcass grades and months at an abattoir

Grade	Code	Month of 2024			
		February	April	July	October
Super	S	3.10	3.70	3.60	4.00
Choice	O	2.70	2.50	2.60	2.80
Commercial	B	2.65	2.40	2.50	2.80
Economy	X	2.40	2.05	2.30	2.40
Manufacturing	J	1.30	1.10	1.15	1.20

Table 2. Price differential at a number of abattoirs for different carcass grades in September 2024

Grade	Code	Abattoir			
		A	B	C	D
Super	S	4.00	4.50	3.90	3.60
Choice	O	2.80	3.70	3.20	2.60
Commercial	B	2.80	3.30	3.10	2.50
Economy	X	2.40	3.00	2.45	2.30
Manufacturing	J	1.20	2.30	1.25	1.15

3. Feedlot margins

3.1 Beef to maize price ratio

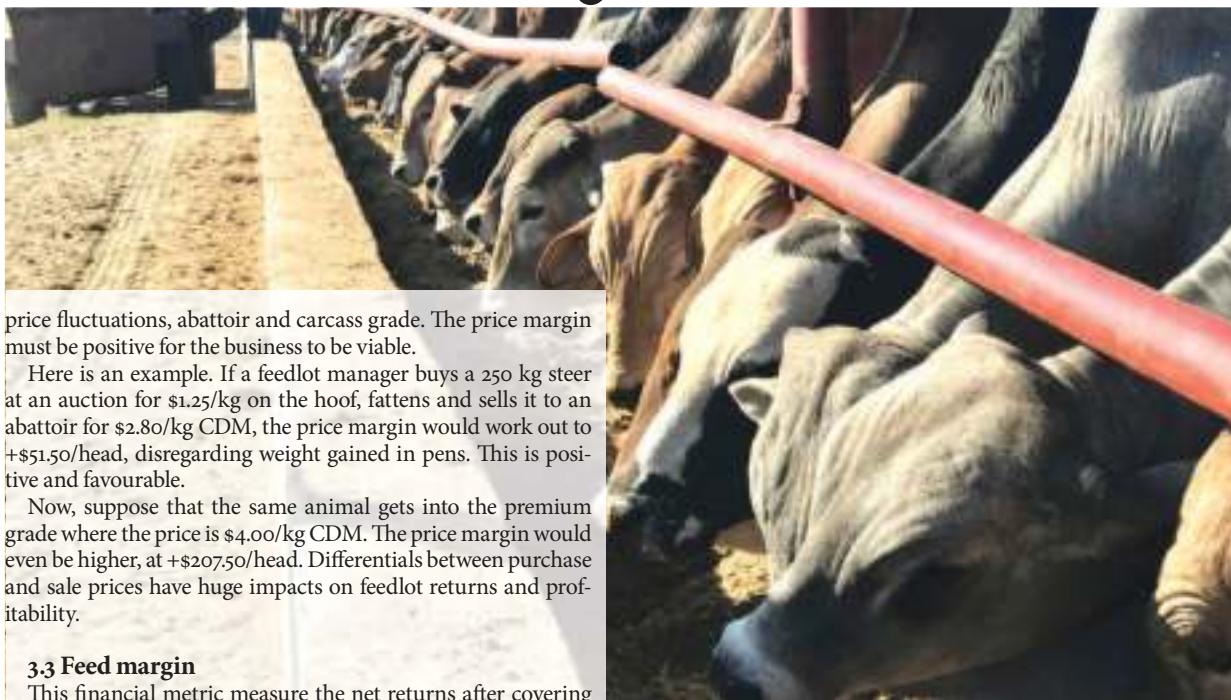
Carbohydrate, usually included in the form of maize, snap corn, hominy chop or sorghum, is the largest ingredient in feedlot rations by weight. As a result, the cost of maize in relation to the beef producer price is a significant factor impacting viability of a feedlot enterprise.

Pen fattening enterprises can make substantial profits when this ratio is favourable. A beef to grain cost price ratio should ideally be 13:1 or higher for pen fattening to be profitable. With the price of choice beef and maize grain at around \$2.80/kg and \$0.30/kg respectively, the ratio is currently below the economic threshold.

In this case, it may not make business sense to go for pen-fattening at this time, unless feed can be procured at lower cost or grown on the farm to push up the feed margin, or animals can be pushed into super grade (for a favourable price margin).

3.2 Price margin

The price margin shows how much value is added to the animal over the fattening period. It includes the difference between animal purchase price and selling price as determined by seasonal



price fluctuations, abattoir and carcass grade. The price margin must be positive for the business to be viable.

Here is an example. If a feedlot manager buys a 250 kg steer at an auction for \$1.25/kg on the hoof, fattens and sells it to an abattoir for \$2.80/kg CDM, the price margin would work out to +\$51.50/head, disregarding weight gained in pens. This is positive and favourable.

Now, suppose that the same animal gets into the premium grade where the price is \$4.00/kg CDM. The price margin would even be higher, at +\$207.50/head. Differentials between purchase and sale prices have huge impacts on feedlot returns and profitability.

3.3 Feed margin

This financial metric measure the net returns after covering cost of feed consumed to achieve weight gains, which is the largest expense in a fattening operation. A higher feed margin reflects high feed efficiency, optimal growth rates and a relatively low cost of feed. If the margin is low, growth rates may need to be optimised, feed procured at more economical prices or alternative feed used.

Let us suppose that our 250 kg steer gained 150 kg more in the feedlot, and the cost of feed to achieve that gain was \$400. The feed margin would work out to just +\$20/head if it grades commercial (\$2.80/kg CDM). If the animal grades to super (\$4.00/kg CDM) the feed margin would even be favourable, working out to about +\$200/head.

3.4 Feedlot profit margin

A summation of price and feed margins less other expenses would indicate profit or loss for the period of time over which the calculation is made. If profit margins are tight, adjustments to feed, procurement of animals or marketing strategies may be necessary.

For illustration, let us suppose that costs other feed and initial purchase of the steer amount to about \$80. In the case of our example carcass grading into commercial class, the result would be a net margin of -\$9.50 (that is, \$51.50 + \$20 - \$80). However, if the steer grades into super, the profit margin would be \$327.50. Based on these hypothetical calculations, the most critical revenue determinant is the final price given for the fattened animal.

4. Conclusions

The key to unlocking the potential of pen fattening lies in understanding where the money is and taking steps to capture it. In this article, we explored some variables and decision making tools that a farmer could use to assess the economics of a pen fattening operation. Anyone contemplating getting into fattening or making a decision would still need to consult an expert for a more informed advice.

About the author

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ZIMBABWE



MADZIWA TEACHERS COLLEGE PRINCIPAL, MR E. PHIRI, COLLEGE ADVISORY COUNCIL, MADZIWA STAFF AND THE ENTIRE MADZIWA TEACHERS COLLEGE STUDENT BODY express warmest Congratulations to Honourable Amb. Dr Frederick Shava on your appointment as Minister of Higher and Tertiary Education, Innovation, Science and Technology Development. Your wealth of experience in your erstwhile portfolios as Minister of Labour, Manpower Planning and Development and Ambassador to China and the United Nations will undoubtedly steer the nation forward in this new capacity. Your expertise, exceptional leadership skills and vision will propel Zimbabwe's Education.

Your continued sterling service to the country speaks volumes of your unstinting and selfless dedication to transform and progress our nation. May your appointment endear Zimbabwe to development, prosperity and Vision 2030.

ZIMBABWE NATIONAL ROAD ADMINISTRATION

DISBURSEMENTS FOR PERIOD 1 JANUARY TO 30 SEPTEMBER 2024

Introduction:

The Zimbabwe National Roads Administration (ZINARA) has made significant strides in funding the maintenance of the nation's road infrastructure through the disbursement of close to ZWG2,7 billion to the various road authorities across the country. This amount includes fuel disbursements of 1,5million litres drawn down during the period in line with ZINARA's strategic agenda to capacitate Road Authorities.

The disbursements, covering the period from January to September 2024, have supported much needed road rehabilitation in both urban and rural areas and ZINARA's strategic funding mix has ensured that local authorities have the resources required to attend to various road works.

Disbursement Overview:

General uptake of funds has been steady across respective categories of road authorities, closing the period at 91% uptake against the annual budget. On average disbursement values, 80% of provinces have accessed above 50% of their allocation, whilst projects currently underway are expected to push this uptake up significantly by the close of the year.

The top takers include Harare Metropolitan Province with 88% uptake, largely influenced by the Harare City Council's 98% budget utilisation. This has been driven by the extensive road works around the city before and after the SADC Summit, yielding positive transformation of the capital's roads.

Mashonaland East has also been a standout, drawing 73% of its allocated ZWG 26, 97 million. Marondera Municipality, Marondera Rural and Chikomba RDC positioned the province on the leader board with 98% uptake by the municipality and 89% respectively for both the rural district councils.

Meanwhile Bulawayo Province is also on the lead with a budget utilisation of 71% on year to date reporting, accounting for a significant number of projects completed and ongoing in the province.

Overall, most road authorities have executed their budgets well and this may be attributed to the improved investment in capacitation of road authorities by ZINARA, particularly with regards to technical competencies to coordinate, manage and acquit disbursed funds.

While disbursements have progressed well in many areas, there are still gaps in budget utilisation, with some road authorities trending below 20%. Support efforts are being rendered as ZINARA's technical department works with counterparts in road authorities to close these gaps.

National Planned Maintenance Projects Update:

In keeping with the workplans submitted to ZINARA, various projects are on course for completion nationwide. In terms of construction, reconstruction, and rehabilitation at the national level, 33,773km of road works have been completed in 568 different projects. This trajectory is very encouraging and ZINARA projects that as further funds are accessed in the fourth quarter, projects will be significantly accelerated to ensure a strong finish to the year.

Looking Ahead:

ZINARA remains committed to the effective discharge of its mandate as a road fund administrator. As a key player in the socio-economic development of Zimbabwe, ZINARA envisions a trafficable road network in line with the national vision of attaining an upper middle-income economy by 2030.

To this end, the administration continues to operationalise its strategic agenda anchored on four key pillars - Integrity, Capacitation, Engagement and Automation (ICEA). Under this strategic agenda, ZINARA is invested in improving service to clients and stakeholders by upholding highest standards of integrity while exploring capacity building alternatives for disbursements to Road Authorities.

To date, fuel disbursements have been effectively administered while work is in progress to facilitate purchase and handover of earthmoving machinery for respective Road Authorities. This is in addition to the technical support rendered in the scheduled regional workshops.

Further to this, ZINARA is open to continuous engagement and collaboration in order to ensure continual improvement in the discharge of its mandate, while investing in technology to automate some of its functions as a means to establishing a more efficient system of operation. The administration is confident of a strong finish to the year 2024 and calls on all stakeholders to continue to support its mission toward contributing to sustained national development into the future.

Road Authority	2024 Budget Allocations (ZWG)	Actual Quarter 1 (ZWG)	Actual Quarter 2 (ZWG)	Actual Quarter 3 (ZWG)	Actual Cumulative (ZWG)	REMAINING BUDGET (ZWG)	
Department of Roads Total	231,599,774	75,820,610	27,968,894	127,810,269	231,599,774	-	100%
National Emergency Works	273,142,239	1,123,197	5,054,692	10,877,103	17,054,992	256,087,247	6%
Rural Infrastructure Development Agency	158,690,698	21,177,196	21,500,000	8,310,936	50,988,132	107,702,566	32%
Buhera	2,272,974	-	-	593,566	593,566	1,679,408	26%
Chimanimani	2,397,340	297,980	365,252	-	663,232	1,734,107	28%
Chipinge	2,393,004	541,013	-	433,239	974,252	1,418,832	41%
Makoni	2,272,408	415,342	116,312	1,845,075	2,376,729	(104,322)	105%
Mutare	2,271,053	352,254	430,322	-	782,576	1,488,477	34%
Mutasa	2,391,819	337,838	468,927	-	806,766	1,585,053	34%
Nyanga	2,403,496	274,626	501,225	1,425,569	2,201,421	202,075	92%
Total RDC	16,402,173	2,219,054	1,882,039	4,297,449	8,398,542	8,003,631	51%
Mutare City	8,978,287	1,351,273	-	1,082,242	2,433,515	6,544,772	27%
Rusape Municipality	2,336,030	316,171	457,669	1,562,191	2,336,030	0	100%
Chipinge Town	2,703,012	237,765	-	569,595	807,360	1,895,652	30%
Total Urban Councils	14,017,329	1,905,208	457,669	3,214,028	5,576,905	8,440,424	40%
Manicaland Total	30,419,502	4,124,262	2,339,707	7,511,477	13,975,447	16,444,055	46%
MASHONALAND CENTRAL							
Bindura	2,272,932	212,481	-	500,000	712,481	1,560,452	31%
Chaminuka	2,272,475	212,438	-	1,000,020	1,212,458	1,060,018	53%
Guruve	2,273,095	1,432,671	-	840,423	2,273,095	(0)	100%
Mazowe	2,273,555	1,543,990	-	-	1,543,990	729,565	68%
Mbire	2,271,788	212,374	-	485,490	697,864	1,573,925	31%
Muzarabani	2,272,045	212,398	466,951	718,512	1,397,860	874,185	62%
Pfura	2,271,955	535,195	-	1,736,760	2,271,955	0	100%
Rushinga	2,274,857	212,661	59,364	306,624	578,648	1,696,209	25%
Total RDC	18,182,703	4,574,207	526,314	5,587,829	10,688,350	7,494,353	59%
Bindura Municipality	3,102,772	336,088	-	243,111	579,200	2,523,572	19%
Murwi town	2,176,857	-	113,712	355,340	469,052	1,707,805	22%
Total Urban Councils	5,279,629	336,088	113,712	598,451	1,048,252	4,231,378	20%
MASHONALAND CENTRAL TOTAL	23,462,332	4,910,295	640,026	6,186,281	11,736,602	11,725,730	50%
MASHONALAND EAST							
Chikomba	2,272,313	491,978	118,698	1,418,323	2,028,999	243,314	89%
Goromonzi	2,272,147	-	292,441	-	292,441	1,979,706	13%
Hwedza	2,271,743	-	120,003	1,450,000	1,570,003	701,740	69%
Manyame	2,296,635	-	179,953	1,049,698	1,229,651	1,066,984	54%
Marondera	2,509,965	611,088	131,112	1,494,445	2,236,645	273,320	89%
Mudzi	2,272,109	493,810	-	1,224,522	1,718,332	553,777	76%
Murehwa	2,275,046	-	118,841	1,517,841	1,636,682	638,364	72%
Mutoko	2,853,300	261,445	149,049	1,244,097	1,654,591	1,198,740	58%
UMIP Zvataida	2,271,879	-	178,013	1,624,379	1,802,392	469,487	79%
Total RDC	21,295,168	1,858,321	1,288,112	11,023,304	14,169,736	7,125,432	67%
Marondera Municipality	5,676,809	-	1,581,628	3,975,001	5,556,629	120,180	98%
Total Urban Councils	5,676,809	-	1,581,628	3,975,001	5,556,629	120,180	98%
MASHONALAND EAST TOTAL	26,971,977	1,858,321	2,869,740	14,998,305	19,726,365	7,245,611	73%
HARARE METRO							
Chitungwiza UC	4,457,584	-	232,850	-	232,850	4,224,735	5%
Epworth LB	2,091,911	187,460	-	699,000	886,460	1,205,450	42%
Harare UC	52,645,417	5,898,512	-	45,575,079	51,473,591	1,171,827	98%
Ruwa LB	2,088,599	-	109,102	959,174	1,068,275	1,020,324	51%
Total Urban Councils	61,283,512	6,085,972	341,952	47,233,253	53,661,176	7,622,336	88%
HARARE METRO PROVINCE TOTAL	61,283,512	6,085,972	341,952	47,233,253	53,661,176	7,622,336	88%
MASHONALAND WEST							
Chegutu	2,308,783	215,832	-	302,741	518,573	1,790,209	22%
Hurungwe	2,257,623	211,050	-	1,017,064	1,228,114	1,029,509	54%
Sanyati	2,274,623	2,197,731	-	-	2,197,731	76,892	97%
Makonde	2,273,597	309,036	-	1,500,000	1,809,036	464,561	80%
Mhondoro-Ngezi	2,272,525	256,791	474,837	1,540,897	2,272,525	0	100%
Nyaminyami	2,275,820	212,732	-	1,095,015	1,307,747	967,873	57%
Zvimba	2,270,001	1,071,221	-	1,189,048	2,260,268	109,733	95%
Total RDC	16,032,772	4,474,392	474,837	6,644,766	11,593,995	4,438,777	72%
Chegutu Municipality	3,603,970	372,798	-	-	372,798	3,231,172	10%
Chinhoyi Municipality	3,865,253	346,373	-	-	346,373	3,518,880	9%
Chirundu LB	2,162,566	-	112,965	1,000,000	1,112,965	1,049,600	51%
Kadoma Municipality	3,869,606	346,763	-	1,272,682	1,619,445	2,250,161	42%
Kariba Municipality	3,057,697	4,633,609	-	-	4,633,609	(1,575,912)	152%
Karoi Town Council	2,755,946	1,176,259	-	535,598	1,711,857	1,044,089	62%
Norton Town Council	2,792,558	3,237,393	-	-	3,237,393	(444,835)	116%
Total Urban Councils	22,107,596	10,113,194	112,965	2,808,280	13,034,440	9,073,156	59%
MASHONALAND WEST TOTAL	38,140,368	14,587,586	587,803	9,453,046	24,628,435	13,511,933	65%
MASVINGO							
Bikita	2,274,359	265,767	-	594,313	860,080	1,414,279	38%
Chiredzi	2,274,216	321,227	-	-	321,227	1,952,989	14%
Chivi	2,276,009	321,480	439,045	-	760,525	1,515,484	33%
Gutu	2,273,510	321,127	-	1,464,956	1,786,083	487,427	79%
Masvingo	2,272,506	321,172	-	-	321,172	1,951,334	14%
Mwenezi	2,273,004	265,609	-	1,492,353	1,757,962	515,042	77%
Zaka	2,274,212	321,226	-	1,172,326	1,493,553	780,659	66%
Total RDC	15,917,815	2,137,609	439,045	4,723,948	7,300,601	8,617,214	46%
Chiredzi	2,750,283	362,539	-	1,777,303	2,139,843	610,440	78%
Masvingo City	5,248,220	710,600	-	1,028,185	1,738,785	3,509,434	33%
Total Urban Councils	7,998,503	1,073,140	-	2,805,488	3,878,628	4,119,875	48%
MASVINGO TOTAL	23,916,317	3,210,749	439,045	7,529,435	11,179,229	12,737,088	47%

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ZIMBABWE NATIONAL ROAD ADMINISTRATION DISBURSEMENTS FOR PERIOD 1 JANUARY TO 30 SEPTEMBER 2024



Road Authority	2024 Budget Allocations (ZWG)	Actual Quarter 1 (ZWG)	Actual Quarter 2 (ZWG)	Actual Quarter 3 (ZWG)	Actual Cumulative (ZWG)	REMAINING BUDGET (ZWG)	
MATEBELELAND NORTH							
Binga	2,969,244	346,967	-	1,900,000	2,246,967	722,276	76%
Bubi	2,238,724	-	146,180	1,500,000	1,646,180	592,544	74%
Hwange	2,739,878	779,825	-	1,300,000	2,079,825	660,053	76%
Kusile	2,235,655	261,245	-	1,500,000	1,761,245	474,410	79%
Nkayi	2,512,392	355,247	-	492,211	847,457	1,664,935	34%
Tsholotsho	2,491,377	-	325,475	-	325,475	2,165,902	13%
Umguza	2,512,359	293,579	-	450,000	743,579	1,768,781	30%
Total RDC	17,699,628	2,036,863	471,654	7,142,211	9,650,728	8,048,900	55%
-	-	-	-	-	-	-	-
Hwange Town	2,547,151	319,075	-	1,296,962	1,616,037	931,113	63%
Lupane Town	2,139,095	-	139,647	1,464,674	1,604,321	534,774	75%
Victoria Falls Municipality	3,679,793	429,998	-	721,176	1,151,174	2,528,619	31%
Total Urban Councils	8,366,038	749,073	139,647	3,482,812	4,371,532	3,994,506	52%
-	-	-	-	-	-	-	-
MATEBELELAND NORTH TOTAL	26,065,667	2,785,936	611,301	10,625,023	14,022,260	12,043,407	54%
BULAWAYO METRO							
Bulawayo City	18,568,731	2,332,324	-	10,790,751	13,123,075	5,445,656	71%
BULAWAYO METRO TOTAL	18,568,731	2,332,324	-	10,790,751	13,123,075	5,445,656	71%
-	-	-	-	-	-	-	-
MATEBELELAND SOUTH							
Beitbridge	2,283,872	-	148,950	1,559,362	1,708,312	575,560	75%
Bulilima	2,277,779	125,053	148,730	1,745,260	2,019,042	258,737	89%
Gwanda	2,497,273	-	163,062	1,155,482	1,318,544	1,178,729	53%
Insiza	2,569,171	300,217	503,270	1,374,639	2,178,127	391,044	85%
Mangwe	2,443,786	474,402	-	1,941,741	2,416,143	27,643	99%
Matobo	2,276,522	266,020	-	1,110,026	1,376,046	900,476	60%
Umzingwane	2,499,584	292,086	-	1,326,962	1,619,048	880,536	65%
Total RDC	16,847,988	1,457,778	964,012	10,213,473	12,635,263	4,212,725	75%
-	-	-	-	-	-	-	-
Beitbridge Town	3,259,493	-	212,935	1,744,959	1,957,894	1,301,599	60%
Gwanda Municipality	3,468,884	-	226,613	-	226,613	3,242,271	7%
Plumtree Town	2,375,220	266,060	-	834,953	1,101,013	1,274,207	46%
Total Urban Councils	9,103,597	266,060	439,548	2,579,912	3,285,521	5,818,077	36%
-	-	-	-	-	-	-	-
MATEBELELAND SOUTH TOTAL	25,951,585	1,723,838	1,403,560	12,793,385	15,920,784	10,030,802	61%
MIDLANDS							
Chirumanzu	2,354,664	1,133,750	-	957,661	2,091,411	263,253	89%
Gokwe North	2,235,077	-	116,753	1,539,664	1,656,417	578,660	74%
Gokwe South	2,291,188	403,646	244,904	1,313,884	1,962,433	328,754	86%
Mberengwa	2,256,538	-	397,492	929,523	1,327,015	929,522	59%
Runde	2,242,695	269,901	150,404	315,000	735,305	1,507,390	33%
Tongogara	2,273,174	417,158	-	812,640	1,229,797	1,043,376	54%
Vungu	2,345,186	219,235	-	838,383	1,057,618	1,287,568	45%
Zibagwe	2,239,739	1,135,531	-	800,687	1,936,218	303,521	86%
Total RDC	18,238,260	3,579,221	909,553	7,507,442	11,996,216	6,242,044	66%
-	-	-	-	-	-	-	-
Gweru City Council	10,773,950	614,742	47,590	-	662,332	10,111,618	6%
Gokwe Town	2,857,720	1,554,736	186,598	1,021,610	2,762,943	94,777	97%
Kwekwe Municipality	4,403,441	596,219	-	1,267,055	1,863,274	2,540,168	42%
Redcliff Municipality	3,072,481	-	200,621	1,098,385	1,299,005	1,773,476	42%
Shurugwi Town	2,651,176	-	-	1,895,544	1,895,544	755,632	71%
Zvishavane Town	2,915,674	714,369	190,382	1,632,280	2,537,030	378,643	87%
Total Urban Councils	26,674,443	3,480,066	625,189	6,914,873	11,020,129	15,654,314	41%
-	-	-	-	-	-	-	-
MIDLANDS TOTAL	44,912,703	7,059,287	1,534,743	14,422,315	23,016,344	21,896,359	51%
GRAND TOTAL FOR ALL ROAD AUTHORITIES	983,125,405	146,799,574	65,291,463	288,541,578	500,632,615	482,492,790	51%
SUMMARIES							
BY PROVINCIAL	2024 Budget Allocations	QUARTER 1	QUARTER 2 (ZIG)	QUARTER 3 (ZIG)	YTD	REMAINING BUDGET (ZIG)	
National Emergency Works	273,142,239	1,123,197	5,054,692	10,877,103	17,054,992	256,087,247	6%
DEPARTMENT OF ROADS - NATIONAL	231,599,774	75,820,610	27,968,894	127,810,269	231,599,774	-	100%
RIDA - NATIONAL	158,690,698	21,177,196	21,500,000	8,310,936	50,988,132	107,702,566	32%
HARARE METROPOLITAN	61,283,512	6,085,972	341,952	47,233,253	53,661,176	7,622,336	88%
BULAWAYO METROPOLITAN	18,568,731	2,332,324	-	10,790,751	13,123,075	5,445,656	71%
MASHONALAND EAST	28,971,977	1,858,321	2,869,740	14,988,305	19,726,365	7,245,611	73%
MASHONALAND WEST	38,140,368	14,587,586	587,803	9,453,046	24,628,435	13,511,933	65%
MANICALAND	30,419,502	4,124,262	2,339,707	7,511,477	13,975,447	16,444,055	46%
MASHONALAND CENTRAL	23,462,332	4,910,295	640,026	6,186,281	11,736,602	11,725,730	50%
MASVINGO	23,916,317	3,210,749	439,045	7,529,435	11,179,229	12,737,088	47%
MIDLANDS	44,912,703	7,059,287	1,534,743	14,422,315	23,016,344	21,896,359	51%
MATEBELELAND NORTH	26,065,667	2,785,936	611,301	10,625,023	14,022,260	12,043,407	54%
MATEBELELAND SOUTH	25,951,585	1,723,838	1,403,560	12,793,385	15,920,784	10,030,802	61%
TOTALS	983,125,405	146,799,574	65,291,463	288,541,578	500,632,615	482,492,790	51%
BY GROUP DISBURSEMENTS							
	2024 Budget Allocations	QUARTER 1	QUARTER 2 (ZIG)	QUARTER 3 (ZIG)	YTD	BUDGET (ZIG) REMAINING	
National Emergency Works	273,142,239	1,123,197	5,054,692	10,877,103	17,054,992	256,087,247	6%
Department of Roads	231,599,774	75,820,610	27,968,894	127,810,269	231,599,774	-	100%
Rural Infrastructure Development Agency	158,690,698	21,177,196	21,500,000	8,310,936	50,988,132	107,702,566	32%
Urban Councils	179,076,188	26,341,126	3,812,310	84,402,850	114,556,286	64,519,902	64%
Rural District Councils	140,616,506	22,337,444	6,955,566	57,140,420	86,433,431	54,183,075	61%
Vehicle Inspection Department	60,005,313	3,849,076	2,757,965	4,216,716	10,823,757	49,181,556	18%
Disbursement towards Plumtree-Mtre Highway	275,714,482	85,572,880	79,339,364	53,109,000	218,021,244	57,693,238	79%
Disbursement to treasury	1,209,813,389	212,143,027	685,752,616	712,302,798	1,610,198,441	(400,385,053)	133%
Disbursement for Tollgate Infrastructure	51,271,180	-	-	7,885,481	7,885,481	43,385,700	15%
Infralink DBSA Loans Repaid	359,040,000	71,760,566	71,760,566	133,801,401	277,322,533	81,717,467	77%
Fuel Disbursement	-	48,023,753	-	-	48,023,753	(48,023,753)	-
Total disbursements	2,938,969,768	568,148,876	904,901,974	1,199,856,974	2,672,907,824	266,061,944	91%

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Dr. Edson Chifamba

Dairy Cow Nutrition (Part 2)

A dairy cow should be fed a ration that will maintain peak production as long as possible. For every 2 kg of expected milk production, large-breed cows should eat at least one kg of dry matter. The high producing dairy cow requires a diet that supplies the nutrient needs for high milk production. Water, Energy, protein, fatty acids, minerals and vitamins, are all nutrients required by the lactating dairy cow to meet the demand by the mammary gland to produce milk and milk components.

Water

- The body of a dairy cow is composed of 70 to 75% water. Milk is about 87% water.
- Water is essential to regulate body temperature. As well, water is involved in digestion, nutrient transfer, metabolism and waste removal. An abundant, continuous, and clean source of drinking water is vital for dairy cows.

Energy

- Dairy cows use energy to function (walk, graze, breathe, grow, lactate, and maintain a pregnancy).
- Energy is the key requirement of dairy cows for milk production. It determines milk yield and milk composition.

Protein

- Protein is the material that builds and repairs the body's enzymes, hormones, and is a constituent of all tissues (muscle, skin, organs, foetus).
- Protein is needed for the body's basic metabolic processes, growth and pregnancy.
- Protein is also vital for milk production.

Fibre

- For efficient digestion, the rumen contents must be coarse with an open structure and this is best met by the fibre in the diet. Fibre contains most of the indigestible part of the diet.
- Cows require a certain amount of fibre for rumen function.
- It ensures that the cow chews its cud (ruminates) enough and therefore salivates. Saliva buffers the rumen against sudden changes in acidity.
- Both the length and the structure of the fibre are important. These determine how much chewing a feed requires.
- Feeds which need extra chewing increase the flow of saliva.
- Fibre in the cow's diet also slows down the flow of material through the rumen and thus gives the microbes more time to digest the feed.
- Products of fibre digestion are important for the production of milk fat.

Vitamins and minerals

- Vitamins are organic compounds that all animals require in very small amounts. At least 15 vitamins are essential for animals.
- Vitamins are needed for many metabolic processes in the body, eg. for production of enzymes, bone formation, milk production, reproduction and disease resistance.
 - Minerals are needed for:
 - teeth and bone formation.
 - enzyme, nerve, cartilage and muscle function or formation.
 - milk production.
 - blood coagulation.
 - energy transfer.
 - carbohydrate metabolism.
 - protein production.

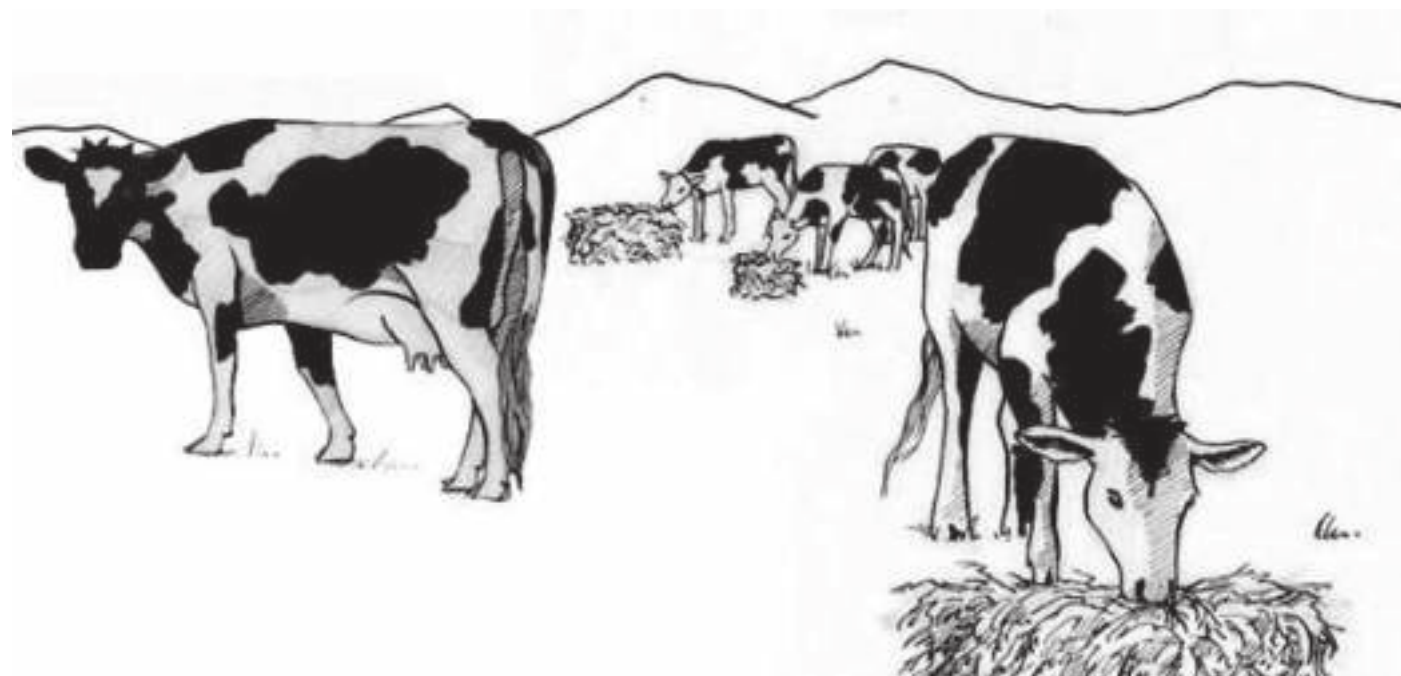


Table 1. Dry matter content of some feeds.

Feed (% of the fresh matter weight)	Dry matter content
Hay	90
Maize stover (brown, dry)	85
Cut grass	30
Silage	25
Napier grass > 1.8 m	25
Sweet potato vines	25
Weeds	25
Napier grass (1.8 m)	20
Banana leaves	12
Maize stover (green at harvest)	10
Napier grass (0.6 m)	10
Banana pseudo stem	5

Feed partitioning

The dairy cow requires adequate feed in order to remain healthy and in good body condition. The nutrients the dairy cow consumes are used for the following body functions:

Maintenance: Animals require nutrients to maintain the body functioning without losing weight.

Growth: Apart from maintaining the body, a growing cow (calf, heifer, even an animal in its first and second lactation) requires additional nutrients in order to grow to its full size.

Reproduction: A pregnant cow requires additional nutrients to support the growth of the unborn calf. Milk production: A lactating cow requires more nutrients in order to produce more milk.

When making rations for dairy cows, the above factors must be put into consideration.

The golden rules for feeding milk cows

- Milking cows have high requirements for water, which should be supplied separately as clean drinking water rather than as part of any concentrate slurry.
- Feed sufficient quality forages (20 to 40 kg fresh forage/cow/day). The daily amount will depend on the
- cows' live weight and milk yield and the farmers' available forage resources.
- Supplemented with concentrates which are formulated to overcome specific nutrient deficiencies.
- Consider wilting the forage, by leaving it out in the sun during the day before chopping it up, to reduce its moisture content and encourage the cows to eat more of it, hence produce more milk.
- At any one time, 60% of milking cows at rest should be ruminating. This is a good reflection

of the overall good herd management which includes appropriate feeding management.

- If concerned about unbalanced diets in milking herd, closely monitor the manure characteristics, changes in feed intakes, changes in milk yield and composition (fat and protein or solids-not-fat) and the proportion of cows that are ruminating.
- Remember that potentially higher yielding cows are more susceptible to other farm constraints such as insufficient quality feed, heat stress, poor animal health and the limited management skills of the farmer.
- Farmers need to develop the skills to identify when cows are on heat. This requires consistent observations, including night time observations. Milking cows may cost more to feed better but they will do more than simply return this investment and will also yield substantial profits in producing more milk and more calves over their lifetime.
- There is no benefit whatsoever in providing concentrates in the form of a slurry.
- When planning milking cow feeding programmes, it is important to feed more concentrates to higher yielding cows.
- It is better to feed green forages rather than dried ones, such as rice straw.
- Selection of forages to grow for livestock fodder should be based on those most suited to the soils, climate and local farmer skills.
- Growing forages requires additional inorganic fertilizers as well as cow manure and shed effluent.
- You must feed the grass as well as feed the cows. Use inorganic fertilizers for forage production.
- The optimum time to harvest forages should be based on their nutritive value rather than their total forage yield. Over mature forages have a low nutritive value.
- Concentrate supplements should be formulated to provide sufficient energy, protein, minerals and vitamins for good consistent milk yield and fertility.
- Calcium and phosphorus supplements are particularly important for milking cows.
- Sourcing ingredients for concentrate supplements should be based on their relative costs of feed energy and protein.
- Cows should be able to rest for as long as they need to, on comfortable and dry bedding as this increases blood flow to the udder and hence milk yield.
- It is best to set realistic target milk yields based on the genetic quality of the cows and the feed (forages and concentrates) available.

- It is more efficient to feed fewer milking cows better but the ideal target milk yields should depend on the farmers resources (for feed supplies), management skills and the motivation to have high yielding cows.
- Cows tend to "moo" when they are on heat or are hungry. Don't ignore their cry.

How much to feed

- Dairy cows have an enormous potential to produce useful nutrients (raw milk and body muscle and fat), but they also have very high nutrient requirements to achieve this potential. For example, over a 12 month period the quantity of protein produced by Friesian cows in milk can vary from 0 to 1 kg/day.
- To achieve such performance levels, dairy cows must be able to consume up to 4% of its live weight as dry matter each and every day.
- The appetite of a milking cow depends on the rate of breakdown of feed in the rumen, other stomachs and the intestines, which is largely dependent on feed quality.
- Her appetite also depends on her health status, her level of comfort if she is heat stressed or being bullied by other more dominant cows and if she is provided with sufficient drinking water.
- Feed intake is usually expressed in terms of kg DM/cow/day, rather than kg fresh feed/cow/day.
- The daily DM intake can also be expressed as a % of her live weight with the maximum appetite being designated as 2.5%, 3% or even 4% of her live weight, depending on her lactation status and how many l/day of milk she is producing.

Water

- Lactating dairy cows in the tropics require 60–70 litres of water each day just for maintenance, plus an extra four–five litres for each litre of milk produced.
- Water requirements rise with air temperature. An increase of 4°C will increase water requirements by six–seven litres/day. High yielding milking cows can drink over 150 litres of water/day during the hot season.
- Other factors influencing water intakes include DM intake, diet composition, humidity, wind speed,
- water quality (sodium and sulphate levels), and the temperature and pH of the drinking water.

Energy

Cows need energy for maintenance, activity

• From Page 10
 , pregnancy, milk production and for gaining body condition.

- Energy needed for maintenance Energy is used for:
- Maintaining the cow's metabolism which includes breathing and maintaining body temperature.
- Physical activities such as walking and eating.
- Physiological state (ie. pregnancy and lactation).
- With most cows in the tropics housed indoors, physical activity is negligible.

Table 2 shows the energy needed for maintenance at various live weights. These values include a 5% safety margin to take into account the energy required to harvest and chew the feeds.

Table 2 Energy requirements for maintenance.

Live weight (kg)	Energy requirement (units)
100	17
150	22
200	27
250	31
300	36
350	40
400	45
450	49
500	54
550	59
600	63

Energy needed for activity

- A small allowance for grazing and eating activity has been factored into the maintenance requirements in Table 2. In flat terrain, 1 unit of energy/km should be added to provide the energy needed to walk to and from the dairy.
- In hilly country, this increases up to 5 units of energy per kilometer.

Energy needed for pregnancy

- A pregnant cow needs extra energy for the maintenance and development of the calf inside her.
- From conception through the first 5 months of pregnancy, the additional energy required is approximately 1 unit/day for each month of pregnancy.
- Energy requirements for pregnancy only become significant in the last 4 months. Table 3 shows the average daily energy requirements during these last months in units of energy.

Table 3 Average daily energy requirements in the last 4 months of pregnancy.

Month of pregnancy	Energy requirement (units)
Sixth	8
Seventh	10
Eighth	15
Ninth	20

Energy needed for milk production

- Energy is the most important nutrient to produce milk.
- The energy needed depends on the composition of the milk (ie. fat and protein content).
- Milk with high fat content might need 7.1 units/l.

Energy needed for body condition

- When an adult cow puts on body weight, it is mostly as fat. Some of this fat is apparent on the backbone, ribs, hip bones and pin bones and around the head of the tail.
- More fat is needed to produce one extra body condition score on a large-framed cow than on a small-framed cow.

Energy requirements from calving to peak lactation

If the forage is very moist, say with a dry matter content of only 12 to 17%, the rumen cannot hold sufficient fresh forage to meet the DM needs

of the cow. Peak milk production occurs around weeks 6 to 8 of lactation. So, when a cow should be gorging herself with energy, she is physically restricted in the amount she can eat.

The level of feed intake is primarily determined by stage of lactation, but can be manipulated. Table 4 shows the feed intakes required for cows to meet their energy needs to produce target milk yields. By providing a high quality diet during early lactation (10 units of energy/kg DM), the physical restrictions of appetite would be reduced.

Table 4 Quantities of dry matter consumed by cows fed diets of different energy density and producing 3 levels of milk.

Milk yield (l/day)	Daily energy requirement (units/day)	Required intake (kg DM/d)	
8 units/kg DM	10 units/kg DM		
13	125	15.6	12.5
17	146	18.2	14.6
20	161	20.1	16.1

The 20 l/day cow could probably not eat 20 kg DM of feed at 8 units of energy/kg DM at any time during lactation, let alone in early lactation when intake is restricted. During early lactation, they will produce more milk from more energy-dense feeds because they have to eat less DM to receive an equivalent intake of energy. Nutritional requirements generally exceed voluntary food intake until week 12, so body fat reserves are drawn upon to make up the nutrient deficit.

Protein

The amount of protein a cow needs depends on her size, growth, milk production, and stage of pregnancy. However, milk production is the major influence on protein needs. Table 5 shows protein needs at different levels of milk production.

Table 5 Crude protein needs of a cow at different stages of lactation.

Milk production	Protein requirements
Early lactation	16 - 18%
Mid-lactation	14 - 16%
Late lactation	12 - 14%
Dry	10 - 12%

Fibre

- Cows need a certain amount of fibre in their diet to ensure that the rumen functions properly and to maintain the fat test.
- Fibre requirements are the absolute minimum values.
- Acceptable levels of fibre in the diet are in the range 30 to 35% of dry matter (DM).
- Low-fibre, high-starch diets cause the rumen to become acid. Grain poisoning (acidosis) may occur. Adding buffers such as sodium bicarbonate to the diet reduces acidity and hence reduces this effect. Buffers are usually recommended when grain feeding exceeds 4 to 5 kg grain/cow/day. Buffers are not a substitute for fibre. Long-term feeding of low-fibre diets should be avoided.

Vitamins and minerals

- Some farmers spend a great deal of money on vitamin and mineral supplements for their cows. Production benefits only occur when the supplements correct a deficiency.
- Before purchasing the vitamin and mineral supplements, it is important to find out whether a deficiency actually exists. In some instances, supplementing animals that don't have a deficiency may lead to poisoning and even death.

Dairy Cow Nutrition (Part 2)

- Mineral deficiencies are less likely if green forages are the major part of the diet. High-producing herds fed diets high in cereal grain or maize silage may need added minerals.

Concentrates feeding

Concentrates are expensive and they should be used economically. Two feeding methods can be recommended:

a Challenge feeding:

This is recommended for cows in early lactation. The farmer is to begin with low levels of dairy meal concentrates (4 kg per day) and increase the amount by 0.5 to 1 kg per day as long as there is an increase in milk production until the point at which further increase does not result in an increase in milk production. Maintain this amount until the milk production starts dropping then reduce the amount of concentrate gradually.

As a rule of thumb, 1 kg increase in concentrate fed should result in an increase in production of milk of 1.5 to 2 l. Feeding concentrates is economical only as long as the price of 1.5 litres of milk is higher than the price of 1 kg concentrate.

b Concentrate re-allocation:

Most farmers have been advised and known to feed their cows a flat rate of 2 kg concentrate per day throughout the lactation period. This amounts to about 10 (70 kg) bags of the concentrate for the whole lactation.

Reallocation means feeding all of the ten bags during early lactation, amounting to about 8 kg concentrates per day for the first 12 weeks of lactation and providing good quality forage only for the rest of the lactation. If the cow is not already accustomed to concentrates, after calving start off by giving 2 kg and increase gradually over the first week to 8 kg.

Reallocation is advantageous in that by targeting the feeding during early lactation when the requirements are high, the cow is able to produce over 20% more milk during the whole lactation. The cow remains in good body condition and is able to come on heat and conceive faster.

Supplements for milking cows

The diet of milking cows must consist of a combination of forages and concentrates. These other feeds are called supplements to the major forage source.

To be continued

• From page 5

Fertiliser Requirements

Average NPK Requirements for Certain Soils (for high rainfall/irrigation)

Fertilizer

Nutrients	Soil Fertility Status		
	Good	Medium	Poor
	Kg/ha of fertilizer nutrient required		
*N	Up to 100	100-160	160-200 *(reduced by about 20% in dry areas)
P ₂ O ₅	30-50	50-70	70-90
K ₂ O	20-30	30-50	50-70

- Marginal areas' requirements based on soil type and climatic conditions.

General recommended fertiliser rates according to Natural Farming Region (NFR)

NFR	Base dressing fertilizer		Top dressing fertilizer		Urea	
	Compound D/ Maizefert	Ammonium nitrate (AN)	Kg/ha	Bags/ha	Kg/ha	Bags/ha
I - II	300 - 400	6 - 8	300 - 350	6 - 7	225 - 265	5 - 6
III	250 - 300	5 - 6	200 - 250	4 - 5	150 - 190	3 - 4
IV - V	200 - 250	4 - 5	150 - 200	3 - 4	115 - 150	3

Time of application

- Generally, all the P, K and the micronutrient requirements and about 1/3 of the N are applied before or at planting in compound fertilizers while the other 2/3 of the N is applied as top-dressing in the form of ammonium nitrate or urea.
- The top-dressing fertilizer is recommended at 4-6 weeks after planting or at maize knee height if applied once. The top dressing can be split applied in sandy soils and/or with high rainfall, which causes leaching. The first 1/2 can be applied at 4 - 6 weeks and the last 1/2 at 8 weeks after planting.
- Secondary (sulphur, calcium and magnesium) and minor/trace (zinc, copper, boron, molybdenum) elements deficiencies should be monitored and corrected.

Methods of fertiliser application:

Fertiliser can either be a) banding in rows/planting stations and b) broadcasted. Banding is usually more efficient than broadcast as fertilizer is concentrated near the plant roots.

Station application of top-dressing fertiliser using the Hand methods

Other soil nutrient replenishing methods

These include organic fertilisers such as Cured animal manure, compost, termite mound soil, incorporation of green manure crops like velvet bean, cowpea and sunhemp, and agroforestry.

Approximate quantities of major nutrients required by maize at different plant populations

Spacing (cm)	Plants/station	Plants/ha	Nutrient amount required (kg)			Expected yield (t/ha)
			N	P	K	
-	-	one plant	0.0087	0.0051	0.004	
100 x 60	2	33 300	289	170	133	6
100 x 50	2	40 000	348	204	160	7
90 x 60	2	37 000	322	189	148	6.5
90 x 30	1	37 000	322	189	148	6.5
90 x 25	1	44 400	386	226	178	8
90 x 50	2	44 400	386	226	178	8
90 x 40	2	55 500	483	283	222	10
75 x 60	2	44 400	386	226	178	8

Land Preparation

The objective of preparing the land is to have level and well-structured soil seed bed which encourages good soil-seed contact. The land must be level at the same time promoting water infiltration. Land preparation can be done as below:

a) Conventional tillage

- It uses all land tillage methods from ripping, ploughing, discing and harrowing. This method is normally very expensive and it promotes destruction of soil texture.
- Land preparation usually starts with winter ploughing immediately after harvesting in April/May when the ground is still moist. Winter ploughing kills weeds, conserves moisture, controls pests and promotes early decomposition of weeds and residues.

Maize production



Station application of top-dressing fertiliser using the hand method

- idues. An ox-drawn or tractor-drawn plough is used.
- Secondary tillage is done in September/October to control weeds and prepare a fine seedbed. It involves ploughing, discing and harrowing using either ox- or tractor-drawn implements.

b) Conservation Agriculture (CA)

There is Commercial CA which focuses on large scale production and Small-Scale CA which focuses on small-scale production.

Commercial CA (Small scale CA)

This refers to any type of tillage practice, which leaves at least 30 percent of the soil surface covered with residue. It follows three main principles namely; practising minimal soil disturbance, protecting the soil by covering it with residue and crop rotation. Emphasis is on residue retention and minimum soil disturbance.

- Tools used include the dibble stick which is used to open small planting stations, the jab-planter which opens small planting holes, applies basal fertilizer and sows seed in one operation and the specialised hand hoe called Chaka hoe for preparing planting basins. Ox-drawn implements include the ripper which is used for marking planting lines and the direct seeder combines row marking, basal fertilizer application and planting in one operation. Larger versions of the ripper (sub-soiler) and the direct seeder are tractor drawn.
- Land preparation in CA starts with winter weeding soon after harvesting in April/May. This reduces moisture loss through uptake by the weeds, controls pests and diseases and adds residues for soil cover. Digging of basins and furrows and ripping then follow from July to September. Application of lime, manure, compost or compound fertilizer is done in October.

Planting (Time of planting)

- Early planting at the beginning of the rainy season is desirable, since yields reduce as planting is delayed after the first week of November.
- The reduction factor is much less in the hotter lowveld areas because the hot conditions accelerate growth and the crop matures early.

Planting Date and Depth Guide

Type	Time	Depth
Water planting	Plant with irrigation or apply water to each planting station about 4 weeks before the rains, end of September to beginning of October. Ideal for late maturing varieties as it lengthens the growing season.	50 mm
Dry planting	Plant in dry soil 2-3 weeks prior to the anticipated first effective rains, usually as from mid-October.	75 mm

Rain planting	Plant with the first effective rains (20mm for sandy soils and 25+ mm for heavier soils) within 24 hours. Plant within two days of an effective rain event and stop until the next rains.	50 mm
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Exact planting dates depend on the farming area and variety/cultivar.

- As a rule of thumb, planting depth should be shallower in heavier soils than in sandy soils. Generally, seed is planted down to 5cm in sandy soils and down to 3cm in clay soils.
- A crop intended for green mealies may be planted much earlier than the summer crop. In frost prone areas of the high and middle veld, the best planting time for an early green mealie crop is at the beginning of August, while in the low veld it could even be earlier in July.

Seed Rate

- Depends on the plant population and seed size.
- General seed rate is 25kg/ha.
- Use certified hybrid seed every year; recycle OPV seed for about 3 seasons.

Plant spacing and population

- Major influencing factors are variety type and stature, farm yield potential, water availability, cultural practices and soil type and fertility.
- Close spacing which gives rise to high plant population is recommended for high yield potential areas, which are found in Natural Regions I and II (800 to 1 200 mm rainfall) or in irrigated areas.
- Wider spacing which gives rise to lower populations is recommended in low yield potential areas of Natural Regions III to V (650 mm rainfall)

Table below shows some guidelines which can be used in selecting the appropriate spacing and plant populations according to natural regions.

Guidelines for choosing maize spacing dimensions

Natural region	Spacing (cm)	Plants/station	Plant population
III and IV	100 x 50	2	40 000
III and IV	90 x 60	2	37 000
III and IV	90 x 30	1	37 000
I and II	90 x 25	1	44 400
I and II	90 x 50	2	44 400
I and II	90 x 40	2	55 500
I and II	75 x 60	2	44 400

Source: Ministry of Lands, Agriculture, Fisheries, Water and Rural Development; Field and Horticulture Crops Handbook For Farmers



Tractor Drawn Disc Plough

Ploughing using Ox-drawn plough



A gilt (first time mother) that farrowed 21 piglets at PIB in May 2024

Critical considerations to enable piglet survival during the farrowing process

FARROWING is a critical process which needs to be managed well to reduce piglet deaths in the first hours of life.

Signs of farrowing

These should be properly noted and understood

Sign	Average onset	Range
Abdominal contractions	1-3 hours prior farrowing	20 min-10 hours
Nesting behaviour	5 hours prior	1-22 hours
Restlessness	Increases	
Respiratory rate	Increases from 25-30/min prior	To 50-80/min 4 hours prior
Reddish vaginal discharge	2 hours prior	20 min-6 hours
Tail twitching	2 hours	5 min-10 hours
Distended udder and milk drawn from teats		Within 6-8 hours

Farrowing Phases

Phase	Key Sign	Comment
0	Signs described	
1	Cervix is open	
2	Litter expulsion	Gilts tend to expulse piglets every 15-20 min, while mature sows tend to do every 20-40 min. Ensure that sows are not under stress during this phase. It lasts 2-6 hours.
3	Placenta expulsion	Typically, farrowing is complete when placenta is out
4	Uterus clearance	Normal secretion for a couple of days, white, and without any smell.

Get the basics done

- Ensure that the environment given prior to farrowing is ideal.
- Ensure that the sows' parentage have a history of achieving piglet survivability and produce piglets with minimum defects
- Drinkers/water troughs should be well placed and ensure that adequate water is given to the sow to reduce unnecessary stress.
- Farrowing crates should be in good working order
- Piglets should be mature at birth, which is at least 1.5kg at birth.
- The sow should be comfortably housed and it should not be over-fat

The stockman should know that achieving pre weaning mortality of not more than 10 percent is possible.

Delivery of pigs

Muscular contractions cause the actual delivery of pigs. The contractions expel the pigs from the uterus, through the dilated cervix and out through the vulva. Twitching of the tail is a signal of piglet movement through the birth canal. Delivery of pigs is considered normal whether the front feet and nose or the hind legs are first to exit the sow. The average time between birth of pigs is 15 minutes with a normal range of 30 minutes. Longer intervals are associated with higher stillborn rates and reduced vigour and survival of pigs. Total delivery times normally averages two and half hours. Farrowings taking 5 hours and above should be considered problem farrowings. Problem farrowings normally result from over fatness, severe constipation, heat and other physical stresses.

Monitoring

The sows should be monitored continuously.

Assisting sows with farrowing problems during farrowing It is recommended not to interfere unnecessarily during a normal farrowing. The navel cord if still attached to the sow should not be pulled so as to minimise bleeding.

If the farrowing interval extends beyond 30 minutes to an hour the stockman should be concerned. If the sow is having contractions but no delivery then the birth canal should be checked for blockages.

Gently enter the sow's birth canal using a well lubricated gloved hand and search the birth canal for misrepresented piglets. Clean the sow's external genitalia and enter the vulva with the fingers and thumb in a close, pointed form, rotating the hand slightly. It is easier to use the right hand if the sow is lying on its right side and vice versa.

Oxytocin usage

Oxytocin injection can be used to supplement the effects of naturally occurring oxytocin. The hormone will not induce farrowing and should never be given before the sow is physically prepared to give birth. It is recommended to use the hormone only in exhausted pigs and use should be limited only to sows that appear to have stopped farrowing before completion of delivery. It is always critical to read instructions to ensure administration of the right dosage and interval. Before using the hormone, it is essential to check that there is no piglet stuck in the birth canal.

It has to be borne in mind that breeding herd is regarded as biological asset which need constant maintenance whether in production or not. It thus becomes cheaper to maintain a sow that gives birth to a large litter size with the right farrowing index as that translates to efficiency in production, one of the determining factors of viability. Piglet survival during the farrowing process should thus be given adequate attention.





Mr Chinembiri examines a tomato plant in a greenhouse



Preparing onions for the market

Claremont Ishaya Farm: A signature of innovative entrepreneurship



Obert Chifamba

A PERCEPTIVE and creative agricultural entrepreneur.

This aptly sums up Dr Fulton Hupenyu Mangwanya's personality as a farmer who has successfully diversified farming operations and integrated other businesses on his 400-hectare Claremont Ishaya Farm situated just 12 kilometres outside Chegutu on the route from Harare.

Dr Mangwanya's keen eye for innovation and immense passion for sustainability have transformed his traditional farming practices into a modern and thriving enterprise. He has turned his fields into a harmonious blend of crops, livestock, agro-forestry and horticulture, showcasing his commitment to holistic agricultural practices.

And that's not all. He has also established a farm shop on the property, offering fresh farm produce, home-made goods and artisanal products to the local community and visitors alike. The place has become a popular destination, attracting customers from far and wide who appreciate the quality and authenticity of his offerings. He has also ventured into recreational activities – opening his farm for musical entertainment, sports and social gatherings providing a unique opportunity for people to reconnect with the land and also learn about sustainable farming first hand.

Through his innovative approach and entrepreneurial spirit, he has created a successful multi-faceted business, which not only supports his family but also contributes positively to the local economy and community.

"My husband has always been in love with farming. You will be interested to know that he went to Chibero Agriculture College where he attained a qualification in agriculture just after completing his secondary education. Farming runs in his blood. The good thing is that I also love farming so we are a couple of farming



Madondo in the farm butchery

enthusiasts," his wife Sheila said during a telephone interview recently.

Mrs Mangwanya observed that they treated their farm, as their retirement home and so they were investing heavily in every facet of production to ensure the place transforms into a real agro-business empire where production and value addition can take place to optimal levels.

Her remarks were easily corroborated by developments on the ground on which they have since given their farm a fresh look that is completely different from what it was when they settled there in 2008.

When this news crew visited the farm recently, it was entertained by the manager Mr Fray Chinembiri and his assistant Philomina Madondo who had been tasked to do so by their bosses, Mr and Mrs Mangwanya who were both away.

Mr Chinembiri related how they hit the ground running when they started farming operations on Claremont Ishaya Farm and went on to produce seed maize, soya beans, commercial maize, tobacco, groundnuts, sorghum and tobacco in their debut.

"We have since dropped some of the crops owing to either labour or water shortages.

Seed maize, for instance, is labour intensive and requires the farmer to have readily available labour. For now, we are concentrating on commercial maize, horticulture (tomatoes, cabbages, onions). Over the years we have been performing decently but not to levels that we expected because we were still trying to gain a strong foothold on the core business of farming while investing in other businesses too," explained Mr Chinembiri.

He remembers 2010 as the year he would want to quickly forget in his life as a farm manager after excessive rains ruined what would have otherwise turned out to be the best tobacco crop produced on the farm in years.

"We lost 50 hectares of a very promising tobacco crop to excessive rains that left it rotting after falling incessantly. That was the point at which we decided to temporarily opt out of tobacco farming, albeit, for the time being," added Mr Chinembiri.

Today, the farm boasts a variety of activities and enterprises ranging from livestock to crop production, value addition, formal businesses (shop, bar, canteen) to recreational. Products that are sold in the shop are produced on the farm while the butchery runs on meat products generated there as well.

"As you can see we are constructing a swimming pool, building a conference centre, play centre for children and booking houses that can be used by those guests who feel like resting after a day's work. We also have a soccer field that we plan to use on rental basis too. Our idea is to provide all services ranging from employment creation, business interactions, agricultural production to social events," said Mr Chinembiri.

They have, however, not forgotten the key business of the farm and plan to build on last season's momentum to continue producing large tonnages particularly for maize as part of their contribution to both national and household food securities.

"Despite the hardships associated with last season's El Nino-inspired drought, we managed to record 262 tonnes of maize, thanks to our irrigation facilities. We are, however, very disappointed after our 100ha of wheat were ruined following the drying up of our water reservoirs. This grossly compromised our yield expectations but gave us the push to increase our irrigation capacity and hectares for some crops this coming season," Mrs Mangwanya commented separately.

She added that they were also adding drip irrigation to the existing three centre pivots to ensure they use water conservatively in the face of unrelenting climate change challenges. They have also drilled four solar-powered boreholes to augment their water supplies while addressing potential power shortages caused by load-shedding.

Besides cropping activities, the farm also has cattle, sheep, goats, broilers and layers to name some of the livestock units available. The butchery they run relies on meat products produced on the farm, making it part of the establishment's value addition initiatives that have also created employment opportunities for the local community.

There are 34 permanent workers with extra hands always hired as and when it becomes necessary. After all is said and done, the Claremont Ishaya Farm is literally being transformed into a multi-disciplinary business entity that will take care of the community's socio-economic and recreational concerns at the same time.

Indigenous chickens: Housing and nutrition

Senzile Ndlovu

Background

INDIGENOUS chickens are the most common and play a vital role in the livelihoods of many communities, particularly in rural and developing areas. They provide a source of income through meat and egg sales as well as contributing towards food security especially for protein. The meat and eggs are tastier and preferred by most consumers to those obtained from commercial breeds. The products are also rich in vitamins and minerals. Indigenous chickens are more tolerant to harsh conditions and are also diseases resistant. They can be fed on cheap locally available feed resources and this keeps production costs lower.

However, productivity is hampered by constraints that result in low average flock sizes, poor reproductive performance and high mortality. Indigenous chickens are exposed to many environmental stresses that include frequent threats from disease outbreaks, pests, predation and adverse climatic conditions.

Indigenous chickens are reared in free range system or semi-intensive system. In a free-range system chickens wander around homestead scavenging for insects, worms, kitchen waste and greens. Some households provide grains such as maize, millet and rapoko to their chickens. In the evening the birds are kept in small shelters. A semi-intensive system is practiced where there is limited space. Chickens are housed in well-built structures and set free in the morning for scavenging but are also supplemented with crushed maize, green vegetables and some commercial feeds.



Housing

Housing protects chickens against predators, thieves, adverse weather (rain, sun, cold winds, and low night temperatures as well as shelter for egg laying and broody hens. Chicken houses are also important for efficient production and management. Chicken houses vary depending on availability of materials, weather and traditions and the type is based on cost, durability and usage. Locally available material like timber, thatch grass, or clay poles can be used. The bark should be removed from wood to reduce parasite load.

The houses should:

- Be built on well drained soils where there should be no mudding to avoid harboring diseases and pests for example mosquitoes.
- Be built in an east west direction
- Have mesh wire if available to allow light entry and free air circulation.
- Have concrete floors for easy cleaning when using dip litter system
- Have perches in the house for chickens to roost on at night.

The roof can be thatch, corrugated zinc or asbestos. If not dip litter system the house should be raised to keep away droppings and protect birds from predators. Chicken houses should have openings on the long sides for ventilation. High temperatures and humidity may cause deaths, drop in egg production, low



Free-range chickens

shells quality and reduced weight gain. To reduce build-up of disease-causing agents and parasite, the house must be accessible, easy to clean and have foot bath at the entrance. Sharp objects should be removed from house to prevent possible injury to the birds and humans. Overcrowding chickens in the fowl run may result in cannibalism.

The table below shows space requirements for chickens at different ages:

Age (weeks)	Birds per square metre
1-4	20
5-10	10
11-18	8
19-78	4

Perches are important for chickens to roost and reduce perching and fighting. Five mature chickens require a one metre perch. Perches are made from rounded sticks which match the chicken's feet. They should be treated with kerosene or used engine oil to keep away parasites.

Nests should be made from durable material and should be 60cm off from the ground. They can be made from wooden boxes or crotched baskets. They must measure 45 by 45 centimetres and should be padded with soft litter. Nests should be placed at a dark place to avoid vent pecking and cannibalism.

Nutrition

Poor productivity of Indigenous chickens is attributed to poor quality and quantity of feeds compounded by poor management practices. Chickens scavenge to meet their nutritional needs. Nutrition is crucial for their growth, health and productivity. Where chickens have nutritional deficiencies, untidy and not smooth feathers will be noticed. They hang wings and are listless. They will often start cannibalizing each other. Calcium deficient hens will start eating eggs or may eat old shells that are left in nests after hatching.

Proteins are very important for growth, egg production and keeping good health status. Protein is usually obtained from plant or animal sources. Examples include crushed soybeans, sunflower seeds, termites, termites' eggs, insects, worms, cotton seed-cake, oil cakes from groundnuts and sunflower cake.

Water is also vital for softening of feed and for the bodily function of birds. Deprivation of water may result in dehydration and can cause death. Chickens should have access to clean water. This can be achieved by placing water troughs at usual feeding points or around the homestead.

Vitamins are supplied by giving a lot of green vegetables. Deficiency in Vitamin A and E may cause ill health. Deficiency of

minerals especially calcium will cause poor eggshell quality and increase egg breakages. Minerals are important for bone and eggshell formation. Phosphorous and calcium should be balanced.

Indigenous chickens can also supplement their diets with other crop products such as seeds, grasses or weeds as well as consumption of insects (locusts, termites), worms, larvae, pupae and any other animal matter. However, the availability of these is variable and seasonal. Commercial feeds are also another option for feeding indigenous chickens though few farmers can afford to buy for their birds.



Confined birds should be given a balanced ration, in the form of a commercial feed or home mixed ration. Home mixes are cheaper than commercial feeds.

The following should be noted when feeding confined birds:

- Buy correct feed for your type and age of birds
- Seek expert advice when formulating homemade rations
- Feed must be gradually changed from one ration to another to allow for adaptation.
- Fresh feed and water should be offered daily in clean troughs to avoid contamination.
- Provide enough feeding and watering space.
- Feed should be kept away from wild birds and rodents.

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Zimbabwe: Livestock diseases to look out for in summer

ProAgri Specialist Writer

SOUTHERN Africa can get really hot during summer, and these are the conditions under which various diseases thrive. Livestock farmers must know what summer diseases to look out for, what the symptoms are and how to treat them.

All ill animals should be provided with nutritious feed, plenty of water, a clean pen protected from dampness, and drafts, and isolated from healthy animals. If these measures and your vaccine still does not help, the services of a veterinarian must be called in.

Cattle diseases:



Bloat

Bloat is also called hoven or ruminal tympanites, and is a disorder of ruminant animals involving distention of the rumen. Bloat cattle are very restless and noticeably uncomfortable. Bloat often occurs in cattle that have grazed rich, young crops, or ingested large amounts of concentrate rations.

Signs

The first sign of bloat is bulging of the area between the last rib and the hip. As gas pressure increases inside the rumen, the entire abdomen enlarges on both sides of the animal. This causes pressure and pain, resulting in difficult breathing.

Prevention

Bloat can be prevented by avoiding rich feeds such as lush alfalfa, and by feeding sufficient quantities of roughage with concentrates. Forgetting to feed the animal or changing its feed abruptly can also cause bloat.

Treatment

- Depending on the severity of the condition, it may be required to quickly relieve the gas pressure.
- Treatment means to slow down fermentation in the rumen and help relieve the excess gas pressure.
- Veterinarians have their own treatment methods that differ from animal to animal.
- For emergency treatment, cooking oil may be administered via the mouth.
- Another emergency treatment is passing a stomach tube or piece of garden hose into the rumen to release the gas, but this should be done by someone with experience.
- A veterinarian or an experienced farmer may also insert a surgical instrument, called a trochar, into the rumen through the exact place high up in the side of the

animal to immediately relieve the pressure.



Pinkeye

Usually animals have a lot of flies around them in summer. Pinkeye is an eye infection that happens when flies deposit the bacterium in the eyes. In most severe cases, it can permanently blind an animal in one or both eyes. Pinkeye can also spread from animals to humans.

Signs

Affected eyes are sensitive to bright light. The first thing a farmer will see is a clear discharge running from the affected eye down the side of the face. The eye appears red and may bulge. A white spot will appear and may remain if the eye does not heal properly. Calves will generally exhibit a more frightened behaviour, as they may have more difficulty to see their surroundings.

Prevention

- Separate infected calves from healthy calves.
- Control flies by spraying, dipping, or dusting calves and spraying calf pens.
- Dispose of manure frequently to eliminate places for flies to lay eggs.
- To avoid getting pinkeye yourself, wash your hands frequently and avoid touching your eyes.

Treatment

- Keep affected calves in a cool, darkened pen and give them plenty of feed and water.
- Apply antibiotic ointments on the affected eyes under the direction of a veterinarian.
- Severe cases may require additional veterinary treatment.



Warts

Warts are viral infections of the skin and can spread among animals.

Signs

Warts commonly appear and spread slowly on the neck, shoulders, and head. Most warts are small, but in extreme cases, they become so large that they break off and can easily become infected.

Prevention

Isolating affected calves will help prevent the disease from spreading to others.

Treatment

Small warts often disappear without treatment, but larger warts will need to be removed and healed. Ask your veterinarian for the best treatment.



Theileriosis

Theileriosis is a disease caused by a species of Theileria — a blood-borne parasite, or also called January disease. It only affects cattle and is primarily transmitted by ticks. To become infected by Theileria, a cow must be bitten by a tick carrying the disease. Once the animal is bitten, it takes about 6 to 8 weeks for the parasite to build up to significant levels in the blood.

Signs

- Pale or yellow, rather than healthy pink, vulva (open up the vulva to look at the colouring).
- Pale or yellow whites of eyes (a sign of jaundice).
- Lethargy — exercise intolerance, cows lagging behind on the walk to the shed.
- Sick cows not responding as expected to treatment for conditions such as milk fever.
- Cows are off their food and appear hollow sided.
- A decrease in milk production.
- Sudden death, especially in late pregnancy or early lactation.

Prevention

This disease can be prevented if you spray and control the ticks around the cattle.

Treatment

- Immediately reducing pressure on the affected animal by:**
- Milking once a day.
 - Minimised handling.
 - When bringing into the shed, let them go

at their own pace (do not push them).

- Good quality feed.
- Medical intervention.
- Treatment of concurrent illnesses (for example ketosis or black mastitis).
- Supplementation of trace minerals and iron (hemo15 multi-mineral injection).
- Blood transfusions.
- Buparvaquone (Butalex).

Sheep diseases



Blue tongue

Blue tongue is an insect-borne, viral disease affecting sheep, cattle, and goats. Although sheep are most severely affected, cattle are the main mammalian reservoir of the virus and are very important in the epidemiology of the disease.

Signs

- High rectal temperature (up to 42,0° C).
- There is swelling of the face and ears, and also pulmonary oedema which may cause breathing difficulties.
- Animals are stiff and reluctant to move.
- Eye and nasal discharges.
- Drooling as a result of ulcerations in the mouth.
- Swelling of the mouth, head, and neck.
- Lameness with inflammation at the junction of the skin and the coronary band.
- Difficult breathing.
- Abortion.

Prevention

The main prevention is vaccination. The vaccines also do not act immediately, with cattle requiring two doses of vaccine (the second at least 6 weeks after the first) to be protected.

Treatment

Treatment is limited to antibiotic therapy to control secondary bacterial infections.

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