



ZIMPAPERS

MAY 2024

ISSUE No. 20

AGRICULTURE JOURNAL



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Summer to dry season transition: Livestock survival and grazing strategies



Eddington Gororo

Introduction

AS Zimbabwe's landscapes gradually shift hues from vibrant greens to earthy browns, livestock farmers face the challenge of transitioning into one of the most difficult dry seasons this year. The dry season in Zimbabwe is very long – roughly seven to eight months in many regions. It can be divided into the cool dry season (mid-April to mid-August – autumn and winter) and the warm-dry season (mid-August to November) – spring period. Each of these periods has its unique challenges (and opportunities). For grazing animals such as cattle, goats and sheep, the dry season situation demands careful planning and adaptive management to minimize the impact of the drought on livestock herds. This article explores key strategies and practices that may help livestock producers to transition into the cool dry season, given the El-Nino induced drought in the last rainy season.

1 Dry season challenges

Following the El-Nino induced drought this season, pasture and water will become limited in supply and quality, threatening the survival of ruminant and other grazing animals. In some cases, pastures may be destroyed by veld fires and depleted from continued grazing with no re-growth. Thus, veld and forage quality and quantity deteriorate significantly.

As the dry season advances, water supplies may start to get depleted and the little water available often becomes warm and stale. Livestock may have to travel long distances to access water and the frequency of watering goes down. There is also increased risk of plant poisoning, since poisonous forbs are the first to appear with the spring flush or following a veld burn.

As a consequence, grazing livestock lose body weight and condition over the dry season, reversing the gains made in summer and reducing pregnancy rates in the next breeding season. In the worst situation, animals may die from starvation, plant poisoning or a lack of water.

2 The opportunities

This dry season may also create opportunities for producers and other livestock value chain actors that have a positive approach and clear objectives. These include cheaper grazing land, cheaper cattle and higher demand for feed and feeding facilities. Significant market opportunities exist for the supply of baled grass, straw, grain and other feed resources to farms in dryer regions and areas hard hit by the recent drought. Researchers and academics may also be able to highlight on-going research and innovation efforts and test technologies that proffer solutions to specific dry season management challenges for ruminant livestock in the country.

3 Drought survival strategies

As we transition into the cool dry season following a severe drought, a number of strategies may be used to make it through the entire season. Farmers are urged to utilize a number of fundamental strategies and practices, as described in the following paragraphs.

3.1 Situation assessment and planning

The current drought conditions have exacerbated the intensity and duration of the dry season, necessitating proactive planning and adaptation. Successful management of the situation requires a positive approach with clear objectives. Objectives and plans must be established with regards to assessment of the quantity and quality of available feed and water; alternative grazing resources and how they can be accessed; feed resources that can be procured including cost and availability; number of animals that can be stocked until the end of the dry season; and strategies for utilization of feed, forage and water resources. Forage quantity and quality can be assessed through a combination of visual assessment, forage sampling, and laboratory analysis.

3.2 Early disposal of excess stock

With limited feed and water availability, difficult decisions regarding herd size and composition may need to be made. Astute and timely stock disposal should be done to match the drought carrying capacity. Often after the carrying capacity calculations, moderate to severe levels of destocking may be necessary. Market prices for beef are already very low, but disposal can still be a viable option to survive the drought. One should prioritise for retention productive breeding cows and growing stock whose value appreciates most after the drought.

3.3 Utilisation of existing and alternative feed resources

Marshy (vlei) grazing areas, paddocks or areas with failing water sources and those most susceptible to veld fires should be utilized early before the abundant grazing becomes unavailable to the farmer. In addition, utilisation of alternative grazing sources such as hired, and lease grazing may be considered. Animals may be moved to areas with abundant grazing for the duration of the dry season.

Paddocks or areas with failing water supplies or those most susceptible to veld fires should be utilised early before the abundant grazing becomes unavailable to the farmer.

Fireguards should also be made early to save most of the grazing that is available. Wean early and leave the calves in smaller

holding pens with adequate roughage, while the dams are herded into the grazing paddocks.

Alternative feed resources such as baled hay, maize stalks, wheat straw and other crop residues may need to be prepared or procured now. Crop residues can be grazed in situ, or carted to the animals for feeding. In some cases, residues need processing and proper utilisation to unlock their value and reduce possible effects of poisoning. Urea treatment helps to improve digestibility, protein content and consequently animal performance.

Another cost-effective feed resource for dry season feeding is chicken litter. It is a good source of natural protein and roughage. Often chicken litter is thoroughly dried and fortified with molasses or grain to mask its bad smell and supply degradable energy. Addition of salt and molasses to roughages helps to fortify them and improve palatability.

Other feed sources that can be used include tree pods collected from indigenous trees such as *Acacia* spp, *Dichrostachys cinerea* (mupangara/ugagu), *Piliostigma thonningii* (musekesa/uhabababa), *Colophosperm mopane* (iphane/mupani) and other species, and dried leaf meal from multi-purpose trees. Such tree-legume species that can be grown in a fodder bank on a farm include *Calliandra calothyrsus*, *Acacia angustissima*, *Leucaena leucocephala*, *Gliricidium sepium* and *Sesbania sesban*, among others.

3.4 Strategic feeding

Feeding objectives and targets must also be established, adhered to and performance monitored through periodic sample weights and condition scores. For young growing stock allowing moderate weight losses through survival feeding may suffice, in the worst case scenario. For pregnant cows, ewes and does, feeding for performance closer to maintenance makes sense. Some compromise may be necessary between the short term and long term objectives, as there is often a conflict between the costs during the drought and cost of recovery after the drought.

Farmers should assess the nutrient content of available fodder and forages and formulate balanced diets through supplementation and



Summer to dry season transition: Livestock survival and grazing strategies

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feed management. Utilising alternative feed sources, such as baled grass hay, crop residues and agro-industrial by-products, can supplement nutritional deficiencies and ensure optimum livestock health and performance.

In this cool-dry season, it is advisable to start supplementing protein before animals start to lose weight. It can be given in the form of urea or winter protein blocks. This will enable animals to better utilise poor quality roughages available as dry graze (foggage), crop roughages or hay. As the drought worsens, there may be greater need to supplement energy in the form of grains, snapped corn (maize husk, grain and cob) or molasses.

3.5 Water Management

Water availability for drinking is non-negotiable during the dry season. In case of failing water supplies, consider providing water to prevent dehydration and maintain animal health.

Water provision options include rivers, dams, troughs, boreholes or carted (tractor and bowser) water. Well-designed watering points help to provide easy access to water for livestock and minimize wastage and spillage.

3.6 Health management

The dry season presents various health challenges for livestock, including drought-related stress, nutrient deficiencies and risk of plant poisoning. Farmers should implement preventive measures to minimise the risk of diseases, such as vaccination, dosing and dipping programmes.

Regular inspections and vigilant monitoring of livestock health enable early detection and timely interventions. Providing shelter, shade and windbreaks for livestock may help to mitigate the effects of heat stress.

During a drought, risks of plant poisoning are higher. Animals grazing on drought stressed crops and their residues (particularly fertilised maize and sorghum) and frosted pasture grasses may be exposed to nitrate and prussic acid poisoning. These must be grazed with caution or measures implemented to reduce risk of poisoning.

3.7 Collaboration and support

To cope with the challenges of the dry season, farmers should work together. Community-based networks, farmer associations and online forums help with regards to information exchange and collective action. This could involve collective grazing and watering arrangements, bulk purchase of feed and hay bales, and group marketing efforts.

4 Conclusions

As livestock farmers navigate the transition into the dry season, proactive planning, and adaptive management are essential. Fundamental strategies and practices as we transition into one of the worst dry seasons include: situation assessment and planning; early disposal of excess stock; early procurement of economic feeds; utilisation of existing and alternative feed resources; strategic feeding of stock; water management; herd health management and community collaboration.

By implementing these strategies and practices, farmers can minimise the impact of seasonal challenges, optimise target livestock performance, and ensure their operations make it through the drought.

About the author

Eddington Gororo is an animal scientist, researcher and academic working for Chinhoyi University of Technology, Zimbabwe. He blogs at <http://letsfarm-zw.com> and can be contacted on +263 77 391 6375 or gorororedington@gmail.com.



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17 April 2024

PRESS STATEMENT:

National Biotechnology Authority Calls for Responsible Importation and Handling of Genetically Modified Grain

The National Biotechnology Authority (NBA) is cognisant of the measures that have been put in place to ensure that the country imports grain for food, feed, or industrial processing. This includes the importation of genetically modified (GM) grain. As you are aware, Zimbabwe is a non-GM producing country. To that effect, the NBA wishes to advise all importers or handlers of imported GM grain to adhere to Statutory Instrument (SI) 157 of 2018, (Food, Feed, Food and Feed Additives and Seed) (Imports, Export and Transit) Regulations. This SI entails that anyone wishing to import GM grain must be registered with the NBA and must have a valid biosafety import permit. The importer is also required to notify the NBA when their consignment of GM grain enters the country, to enable the NBA to deploy inspectors to the site where the grain will be processed. The GM grain is to be processed under strict supervision by the NBA.

The nation is hereby cautioned that it is an offence to import GM grain without a permit from the NBA. In addition, it is also an offence to process GM grain without NBA supervision. Violating provisions in SI 157 of 2018 will result in the perpetrator being liable to a fine not exceeding level 12 or to imprisonment not exceeding five years or to both such fine and such imprisonment.

For any further clarifications, or information, please do not hesitate to contact us.

Thank you for your cooperation.

Dr. D.T. Savadye
Chief Executive Officer and Registrar, National Biotechnology Authority

Board: Prof. F. Mtambanengwe (Board Chair), Mr E.K. Moyo (Vice Board Chair), Dr D.T. Savadye (Board Secretary), Prof. M. Masocha, Dr F. Chatiza, Mr Z. Dhlamini, Dr Eng. W.D. Ganda, Ms N. Mazadza

Editor's Note



WE meet once again during a transitioning time from summer to winter. You will appreciate that change is never a simple thing for you on the farm. I bet most of you would find it rather so much easier to keep doing things the way you have been doing throughout the summer season than adopt something new.

Winter comes with a lot of demands for the farmer. There is the vegetable garden to keep safe from the biting frost, lest some

of the delicate veggies get frost-bitten. There is also the orchard to protect from the cold weather and the chickens to keep warm and appropriately fed.

You must also not forget the labour involved in stocking crop residues and other edible materials for livestock during the cold dry months of the year, which later turn into infernos come the month of October. This is the most difficult period of the year, as most of the shallow water sources would have dried up and livestock units such as cattle have to be driven for distances to get water.

In the country's arid regions, farmers will be doing relief grazing. Yes, they will take their cattle to areas where there is still some grass and vegetation and stay put until the onset of the rains to make sure they have draft power animals in good shape for tillage activities.

I must hasten to say that this is also the time you can scout for replacements for your ageing span of oxen so that you start the season with energetic steers that will not give you problems. It is also the time to train your rookie steers to adjust to working under the yoke while those implements that would have found the going tough during summer should either be replaced or rehabilitated for the better.

The dry season is also the time you should be gathering your inputs for the season and making sure your boundary fences are in good shape lest your crops for the next term will be sitting ducks for marauding stray animals that do not stop at anything they find in their path. Let me also remind you that the stocked feeds should be monitored for safety and must not be where they are easily accessed by passing animals. They should also be protected from veld fires that have become a common problem in recent times.

Till we meet again. Enjoy!!!



Stover urea treatment in Bubi district

Supplementary feeding key in livestock nutrition



Sinzile Ndlovu

SUPPLEMENTARY feeding aims to supply livestock with nutrients, which have become deficient in natural grazing. This is usually done in peak dry season especially with cattle being the most vulnerable species being affected by drought and it should be coupled with enough clean water since animals can survive for long periods on water only compared to when they only feed without water. It prevents decline in animal condition and is required before animals lose 15 percent of their body weight. Mineral elements are supplemented during the wet season at recommended feeding rates. Commercial feeds and indigenous feed resources mainly crop residues, tree leaves, Acacia and Dychrostachys cenerea pods are the options that farmers use to supplement their livestock. The availability of crop residues is constrained by the frequency of drought.

Cattle

In communal areas, both protein and energy may be limiting because of inadequate grazing. Therefore, supplementary feeding should be considered any time of the year especially in winter according to animal's requirements in respect of cows in production, calves and draught animals. During winter cattle survive on stover, which can be treated with urea or molasses at recommended rates. This is done to increase protein content, palatability and digestibility of stover. Salt is also used to improve palatability and if dissolved and sprayed on stover. Cattle fed with urea treated stover need close monitoring after feeding to be able to treat those affected by urea poisoning as soon as

possible.

- Levels of protein supplementation:
- Lactating heifers 500g of crude protein/day/animal
- Lactating cows 350g of crude protein/day/animal
- Young stock 150g of crude protein/day/animal

Urea Treatment of Stover

It is usually done after harvesting when the stover is quite dry between May and July. The treatment period is 4 weeks in areas in high temperatures and 5 weeks in cool areas.

Stover urea treatment in Bubi district

Method:

- The pit should be 4m long, 3m wide and 1m deep. The pit should be lined with a heavy plastic sheath to prevent air and rain water.
- 1 tonne stover chopped to about 5cm or matchbox size.
- 50kg urea fertiliser and 200 litres or drum of water should be thoroughly mixed
- Put a layer of stover into the pit and sprinkle urea solution on stover using fine rose can or knapsack sprayer to attain even distribution of water. NB: make sure the knapsack sprayer used has not been used for other chemicals.
- Compact the roughage and add another. The process is repeated until all the roughage is moistened and compacted to ensure an airtight condition. Air is excluded because it promotes decomposition and mould or fungus development which is detrimental to livestock health.
- The pit is covered with a plastic then soil is placed on top to ensure rain water dose not penetrate the treated stover.

- After four to five weeks the and only the quantity required for animal is taken and placed under a shade for seven days to allow ammonia to dissipate from the feeding material. The feeding material is placed under the shade to avoid moisture, water and direct sunlight as it spoils the nutritive value of the feed.

Feeding:

- Calves and donkeys should not be fed urea treated stover because they will die.
- Animals should be fed lower quantities (minimum 500g) in the initial days so that the animal get used to the feed. The amount can be increased slowly until it reaches not more than 3kg per day.
- Water should be provided 3 to 4 hours after feeding and close monitoring of animals should be done so that those affected by urea poisoning can be treated as soon as possible.
- If the animal skips a day without being fed urea treated stover, the process of feeding is started again by giving smaller quantities and increased until the maximum required quantity.

Sheep and goats

Preference should be given to does in the last 6 weeks of pregnancy, lactating does and their kids and slaughter goats being prepared for the market. Adequate protein and energy is important for good conception rates, milk production and kid growth rates

Sources for protein supplementation can be

- legume fodders (lablab, leucaena, velvet bean,
- legume hays (all dried forms of the above)
- purchased agro-industrial protein supplements (goat meal, cotton seed meal, sunflower meal and soya bean meal)
- High-energy supplements include
- Maize, rice or wheat bran
- Goat meal or goat pellets from feed manufacturers.

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Importance of body condition of dairy animals



Dr Edson Chifamba

Body Condition (What is it? Why is it important? How to measure it?)

CONDITION scoring is the visual evaluation of the amount of muscle and fat covering the bones of an animal.

- It can be assessed independently of live weight, gut fill and pregnancy status and involves observing specific points on the animal.
- Body condition affects milk production and reproductive performance. Enables farmers to compare the condition of their cows with recommended targets.
- Knowledge of condition scoring enables farmers to manage their feeding programs better.
- A very useful tool to monitor feeding management by providing a subjective estimate of the amount of muscle and subcutaneous fat between the pin bones and the tail head, over the hip and covering the lumbar vertebrae.
- Increases when energy intake exceeds energy output and decreases when energy output exceeds energy intake.
- For an overweight cow, there is a risk that around the time of calving and in early lactation, she will consume too little feed.
- Sharp falls in condition may also lead to fertility problems e.g. poor or non-existent heats.
- Body condition scores can be based on a 1 to 5 system as in Table 1 with pictorial standards presented in Figure 1.

Condition Descriptors*

1) Very poor Very thin; Spine like teeth on a saw; Transverse processes prominent with more than half the length visible; Pin bones are very prominent, with a deep V shape cavity below the tailhead and no fatty tissue under the skin

2) Moderate

Skeleton clearly visible; Individual vertebrae can be identified on the spine; Transverse processes are 1/2 to 1/3 visible with the ends rounded and can be identified individually; Pin bones are prominent with a U cavity below the tailhead and some fat under skin

3) Good Skeleton and covering are well balanced; Spine form a sharp ridge; Transverse processes are 1/4 visible and individual vertebrae can still be identified but only by pressing on them; Pin bones are rounded and smooth, with a shallow cavity below the tailhead and fat cover over whole area, skin smooth, pelvis can be felt

4) Fat There is excess fat covering; Individual vertebrae cannot be identified; Transverse processes have a smooth and rounded edge; Pin bones are covered in fat with a shallow cavity below the tailhead and patches of fat evident

5) Grossly fat or obese Spine is covered with fat; The ridge of transverse processes is barely visible; Pin bones are completely covered in fat with the cavity filled with fat rolls; The pelvis is impalpable, even with firm pressure

* The spine is assessed over the lumbar vertebrae. The transverse processes are the horizontal parts of the lumbar vertebrae. The pin bones are the bones on either side of the tail head.

Target body condition scores for cows and heifers are as follows:

Situation	Cows	Heifers
Pre-calving	2.5 – 3	2.5 – 3
Pre-service	2 – 3	2 – 2.5
Drying off	2.5 – 3	

If the average body condition score is:

- Within the normal range, the cows are receiving sufficient energy in their ration.
- High, there is a risk that feed intake will be depressed at the beginning of the next lactation, so ensure cows are not too fat at the end of the current lactation.
- Low, energy intake has been insufficient and resistance to disease could be adversely affected, so increase feed intake and/or energy density of the ration.
- Cows should be condition scored repeatedly to assist with feeding decisions. They can be interpreted as follows:
 - If the score is within the normal range, then feeding management is correct.
 - If the score is below the normal range and changes by less than 0.75 points, then feeding management throughout lactation is correct but overall condition can be improved.
 - If the score decreases by more than 0.75 points during early lactation, then energy intake is too low hence dry cow, transition and early lactation feeding should all be reassessed.
- If cows become over fat towards the end of lactation, then the energy: protein balance in the milking ration should be fine-tuned.

Milk production and body condition

- Cow body condition has a large effect on milk production and fertility. The cow either store body fat or mobilises it, depending on the level and type of feed and the stage of lactation. Figure 1.2 depicts the changes during lactation of the partitioning of feed nutrients between the udder and body reserves.
- Adequate body reserves enable high production peaks to be achieved, which contributes to high milk production for the whole lactation.
- Body condition in early lactation
- If cows are fat enough at

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Supplementary feeding key in livestock nutrition

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Poultry

Farmers usually neglect their free range chickens by not feeding them with feed required to improve their production. This is the main reason why scavenging chickens take a longer time to grow and reproduce. Diet for scavenging chickens is limited in quality and quantity. The food components in the table below need to be considered:

Nutrient	Supplement
Carbohydrates	Grains (maize, sorghum, millet), crushed dried sadza
Protein	Crushed roasted soya beans, crushed sunflower seeds
Fats	Crushed sunflower seeds, crushed roasted soya beans
Vitamins	Green grass/vegetable, Vitamin stress packs (purchased and manufacturer's recommendations to be followed)
Crude fibre	Maize husks, crushed ground nuts shells, vegetable leaves
Minerals	Thoroughly crushed eggshells (calcium), salt, vitamin stress pack

- Penned birds should be given balanced rations in the form of commercial feed or home mixed ration

Home mixes

These are feeds mixed at home. The farmer buys raw materials and mixes at his farm. This is usually cheaper than buying complete feeds. The raw materials are soya bean meal, maize/grain crash, vitamins and minerals (premix). The mixes should be in the following ratios:

- The starter
 - soya bean meal 36%
 - crushed maize 60%
 - vitamins and minerals (premix) 4%
- The finisher
 - Soya bean meal 27%
 - Crushed maize 69.2%
 - Vitamin and minerals (premix) 3.8%

The following should be noted when feeding confined birds.

- Buy correct feed for your type and age of bird
- Seek expert advice when formulating home-made 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 stored away from wild birds and rodents preferably on raised platform

The author is the Acting Livestock Specialist Supplementary Feeding for ARDAS

RUSAPE TOWN COUNCIL



PROPOSED LEASE OF COUNCIL LAND

Notice is hereby given in terms of **Section 152** of the **Urban Councils' Act (Chapter 29:15)**, that Rusape Town Council intends to dispose 1 (one) institutional stand and 1 (one) industrial stand. The stands will be disposed in terms of Council standing policies.

Stand No.	Location	Area (m ²)	Land Use
7764	Crocodile	5 034	Institutional (Church)
8364	Delta industries	1 360	Industrial

The proposed development conditions are available at Council for scrutiny during the 21 day period. Any persons wishing to make objections can lodge the same with the undersigned within a period of 21 days from the date of this publication.

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RUSAPE.

Antimicrobial Resistance: Risks to agricultural production systems and human health



Addmore Waniwa

MANY people may not understand the quality and safety issues associated with milk that has traces of antibiotics when it gets into the food chain. This article seeks to provide an insight into the issue of antimicrobial resistance and outlines the responsibility which dairy farmers as other livestock farmers have in order to ensure public health.

What are Antimicrobials?

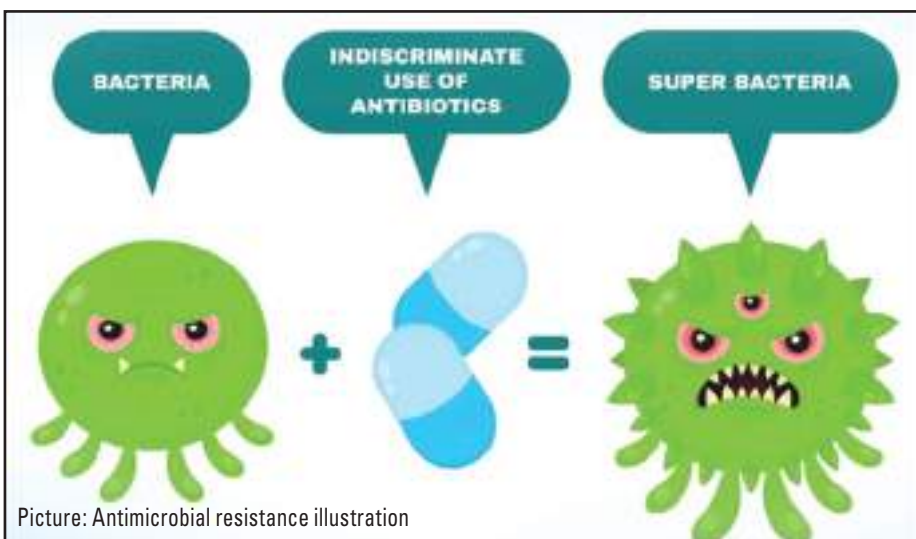
Antimicrobials are medicines that kill or stop disease causing germs (bacteria, viruses and fungi).

What is Antimicrobial Resistance (AMR)?

Antimicrobial Resistance happens when microorganisms (such as bacteria, fungi, viruses, and parasites) can survive and grow even when they are exposed to antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics).

Causes of Antimicrobial Resistance

- The excessive and inappropriate use of antimicrobials leading to the emergence and spread of antimicrobial-resistant micro-organisms



Picture: Antimicrobial resistance illustration

Risk to human health posed by Antimicrobial Resistance

- Resistant bacteria and resistance genes may be transferred to humans from animals and food.
- Without effective antibiotics, the success of major surgery and cancer chemotherapy would be compromised.
- The cost of health care for patients with resistant infections is higher than care for patients with non-resistant infections due to longer duration of illness, additional tests and use of more expensive

drugs.

- Can also result in a post-antibiotic era in which common infections and minor injuries can kill.
- Risk to agricultural production systems (e.g. dairy production) posed by Antimicrobial Resistance
- Threat to disease control resulting in prolonged illness, disability, and death of animals.
- Animal losses and reduced production resulting in implications for food security and the economic wellbeing of farming households.



Picture: Antimicrobials for human treatment



Picture: Dairy cows being injected with antimicrobials for udder health

How can dairy value chain actors decrease AMR spread in Zimbabwe?

1) Farmers

- Adhering to good farm hygiene, bio-security and animal health practices can greatly reduce the need to use antimicrobial medicines.
- Always vaccinate against diseases; prevention is better and cheaper than treatment.
- Use antimicrobials for treating animals only when advised and under the super-

vision of veterinarians.

- Use correct dose! Give antimicrobials for the whole recommended time, even if the animal appears better.
- Only buy drugs from approved or licensed outlets.
- Do not use counterfeit antimicrobials.
- Always wait the full withdrawal period after treatment before milking or slaughtering animals.
- Do not feed antibiotic milk to other livestock classes e.g. calves, pigs.



Picture: Lab testing Kit for antimicrobials

2) Processors

- Test for antimicrobial residues at milk reception.

Discard all milk with antimicrobials; it is

not suitable for human and animal consumption.

The author is a Regional Dairy Officer, Department of Veterinary Technical Services

Importance of body condition of Dairy Animals



Pictorial standards of body condition scores in milking cows

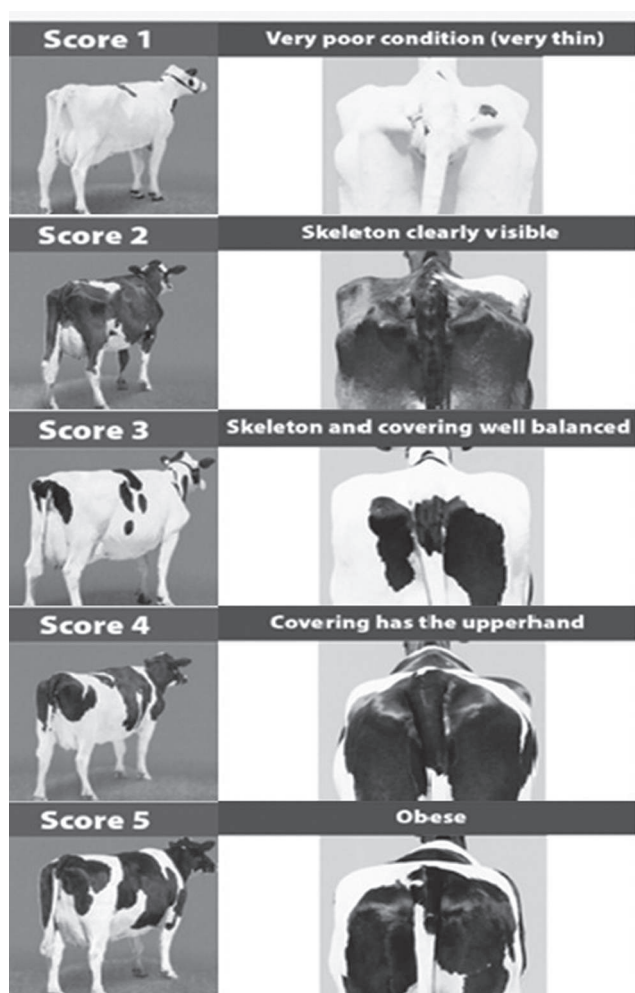


Table 1. Descriptors for condition scoring of dairy cows for the 5-point body condition scoring system.

Condition	Descriptors*
1) Very poor	Very thin; Spine like teeth on a saw; Transverse processes prominent with more than half the length visible; Pin bones are very prominent, with a deep V shape cavity below the tailhead and no fatty tissue under the skin
2) Moderate	Skeleton clearly visible; Individual vertebrae can be identified on the spine; Transverse processes are 1/2 to 1/3 visible with the ends rounded and can be identified individually; Pin bones are prominent with a U cavity below the tailhead and some fat under skin
3) Good	Skeleton and covering are well balanced; Spine form a sharp ridge; Transverse processes are 1/4 visible and individual vertebrae can still be identified but only by pressing on them; Pin bones are rounded and smooth, with a shallow cavity below the tailhead and fat cover over whole area, skin smooth, pelvis can be felt
4) Fat	There is excess fat covering; Individual vertebrae cannot be identified; Transverse processes have a smooth and rounded edge; Pin bones are covered in fat with a shallow cavity below the tailhead and patches of fat evident
5) Grossly fat or obese	Spine is covered with fat; The ridge of transverse processes is barely visible; Pin bones are completely covered in fat with the cavity filled with fat rolls; The pelvis is impalpable, even with firm pressure

* The spine is assessed over the lumbar vertebrae. The transverse processes are the horizontal parts of the lumbar vertebrae. The pin bones are the bones on either side of the tail head

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calving — this is an important source of energy at a time when cows are trying to achieve peak milk production and their appetites have yet to reach 100 percent. Cows in higher condition at calving also have better fertility.

- If cows are low in body condition at calving and are underfed in early lactation, their peak milk production will be depressed and they will partition less feed to milk and more towards body condition over the whole lactation.
- Rapid loss in body condition during early lactation can adversely affect cow performance, through metabolic problems and delayed conception.

Body condition in late lactation and the dry period

Milk production falls in late lactation because:

- Cows are using more of their food intake to build body condition rather than to produce milk, their intake ability has decreased or they

are being offered less feed or lower quality feed.

- Cows with high genetic production potential tend to continue partitioning nutrients to milk rather than to body condition during late lactation. They must then be fed very well at this time to put on body condition ready for their next calving.
- The dry period may be the only opportunity for cows to put on condition. However, cows use feed energy more efficiently to put on body condition while still milking compared to when dry. Therefore, it is better to plan feeding management to replace body condition during late lactation, rather than during the dry period.

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POSB
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PUBLIC NOTICE

Business Conditions Review

The People's Own Savings Bank (POSB) wishes to advise that the Bank will be reviewing its business conditions effective May 2024. The updated business conditions will be available on the POSB website www.posb.co.zw in due course.

In the interim, the current business conditions can be accessed on the same POSB website.

For more information and assistance, contact us on:

Switchboard - +263 242 793 831-7
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A guide to broccoli production

BROCCOLI is a vegetable, rich in vitamin C, protein, fibre and flavour. It is also known as a "Super Food."

Broccoli belongs to the "Brassica –Genus" closely related to Cabbage, Brussels sprouts and Cauliflower. Broccoli types are, Large-headed varieties, Sprouting varieties and Romanesco varieties.

Large-headed are the standard type with heads weighing from 400 up to 850 grammes.

Sprouting broccoli like purple and green sprouting broccoli produces numerous heads on long stalks and romanesco varieties produce elegantly swirled heads composed of symmetrically pointed spirals.

The Broccoli is grown during the cool weather conditions of winter. During the hot, wet conditions of summer the head sizes tend to be smaller.

Broccoli is easier to grow than its relatives, cauliflower and brussels sprouts and can produce bountiful crops. Broccoli is always in high demand on the dinner table.

Site Selection

Broccoli grows very well in medium to medium heavy-clay loam soils with good water holding capacity. It can be grown however, in sandier soils but will require more frequent irrigations and higher fertiliser rates. PH levels should be from 5.8 to 6.5 as broccoli likes to have an alkaline soil.

Broccoli responds very well to compost and organic enriched soils.

Levels round 25 to 35 bags per hectare of well- prepared compost or farmyard manure will benefit the crop and help reduce the levels of costly fertilisers.

Make sure compost and manure are well broken down when put in the fields or root burn may occur.

Chicken litter can also be used at two to five bags per hectare but must be well composted.

If ploughing, plough to a depth of 30 to 35 centimetres which will make sure that the soil is prepared for good root development, but make sure any old plough pan is broken up.

If ripping, then discing is preferred to prepare a fine tilth. The soil should not be too cloddy, also not too fine.

During winter months, if possible, plant on North facing slopes to achieve better soil warmth.

Spacing

If planting on beds which are at 1,5 metres, centre to centre the in-row should be 30 centimetres apart and two rows placed on the bed 50 to 60 centimetres apart. This should give approximately 44,000 plants per hectare. Planting on the flat, rows can be 40 centimetres apart and in row of 35 centimetres apart. Higher plant populations give smaller heads so populations should be governed by market requirements.

Fertiliser

Broccoli can be susceptible to hollow stem problems caused by a Boron deficiency. If there is a Boron deficiency in the soil, apply Solubor as a foliar spray every two weeks at a rate of 10 grammes/litre of water.

A balanced Basal type fertiliser of either "A" "B" or "C" should be applied before

"Integrated Crop Solution"

planting.

A vicon spreader can be used to broadcast the fertiliser on the flat or a ridge type applicator to apply the fertiliser if the crop is to be grown on beds.

Cupping with fertiliser cups by hand into the pre-marked planting holes can also be done but the fertiliser must be well mixed in the hole with the soil to prevent root burn.

Based on soil analysis results, the rates of fertiliser can be adjusted to the rate to be applied and if compost or manure have been applied the rate can also be reduced.

Fertiliser rates of 500 to 750 kilogrammes per hectare can be applied.

Broccoli requires around 400 kilogrammes per hectare of Ammonium Nitrate (AN), split into three applications from three up to six weeks after transplanting.

If the crop is being planted on sandier soils and during the rainy season, extra top dressings might be required after heavy leaching rains. Plantings going into mid-winter should be top dressed with Calcium Nitrate, instead of A.N. as it works quicker in cool soils.

Seedlings

Planting with seedlings is the most practical method. Use a recognised nursery where strong and healthy seedlings are produced.

Transplanting good seedlings this gives a base for a more uniform crop, which reduces costs at harvest time.

Order around 10 percent more seedlings for your selected plant population from the nursery to ensure best seedling selection when transplanting.

When using seedlings or speedlings as they are most commonly known, at

transplanting make sure that good plug to soil contact is made so the root system can leave the plug and quickly enter the soil enriched with either fertiliser or compost.

Plant the speedlings as soon as possible after collecting them from the nursery to avoid the tiny hair roots from drying out.

Plant the plugs/speedlings into pre-irrigated soils in which the field has been brought up to field capacity. After transplanting a light settling-in irrigation is required to remove tiny air pockets between the plug and the soil.

Varieties

Selection of a variety depends if it is to be marketed as fresh or frozen. Broccoli is usually a cool weather crop but can be grown year-round with correct variety selection

Broccoli is quite frost tolerant. There are two types, heading and sprouting. Sometimes selected varieties might produce side shoots once the main head has been harvested. Variety selection will also have maturity dates varying from 60 to 75 days.

Harvesting

Time of harvest is primarily determined by the tightness of the florets and not by the size of the head.

The head should be firm and compact, not opening and loose. If leafy points have come through the head before harvesting it shows harvesting is late, or the plant has been under stress. This is more common in hot summer weather conditions when head size is generally smaller than in winter production.

When harvesting cut the central stalk at a 45-degree angle, 13 to 20 centimetres below the head. This will keep water from pooling inside the cut stem and causing rot.

Broccoli has a poor shelf life at ambient temperature.

so the harvested heads will require cold storage or to be delivered to the fresh market in the shortest possible time. Brown or Purple beads is a physiological problem that is more prevalent under hot humid conditions.

Irrigation

Regular water applications during the dry winter months is essential. Overhead irrigation or centre pivot irrigation is the most common followed by flood and more recently drip irrigation, which is becoming more affordable.

Broccoli like cauliflower, the irrigations must be spot on or "Hollow stem" will occur due to fluctuations of water levels in the soil.

Approximately 600 to 750 millimetres of irrigation should be allowed to produce a quality Broccoli crop. Therefore, planning water usage from dams, rivers and boreholes can be worked out to match hectares to be planted.

As the plant increases in size and leaf area and the head starts to form, the amount of water required also increases.

Irrigation should be planned on a weekly basis and the soil depletion area checked regularly to plan for the next irrigation cycle.

A quick test is to take a fist full of soil in your hand, squeeze it to form a ball then tap the "ball" with your finger, if it collapses it is becoming dry and irrigation should be applied immediately. Preferably it should not have gone as far as this stage. The use of an evaporation pan should help with scheduling.

Rotations

In rotation planning do not follow with Broccoli if the previous crop has been a Brassica type that is Cabbage, Cauliflower or Rape. Always rotate with a legume or root crop.

Adapted from Seedco



European fine beans export market



Bolton Kudzai Kakava

Introduction

FINE beans are a common vegetable in Europe. There are ample opportunities to export off-season fine beans to ensure an all-year-round supply. According to Centre for Promotion of Imports (CBI), the Netherlands and United Kingdom (UK) remain the largest importers of fine beans. Fine beans represent 20 percent of vegetables exported from Zimbabwe.

Fine bean description

Fine beans (*Phaseolus vulgaris* L.) are adapted to the Zimbabwean climate and are usually grown during winter months. Fine beans are smaller and tender and quicker to cook. They are also called haricots verts, filet beans or needle beans. Fine beans have vitamin C, vitamin A and vitamin K as well as beta-carotene, folate and potassium. The varieties grown Samantha, Boston, Serengeti among others. Fine beans take 60-90 days depending on the season and variety. Fine beans can yield 8-15 tonnes per hectare if good agronomic practices are followed. During postharvest, they are hand-picked, sorted and graded to guarantee high quality pods. The ideal temperature for storage and transport is 4-8 degrees Celsius with a high relative humidity of 95 percent.

Market

The demand for fine beans in Europe is all year round. They are imported throughout the year. Most fine beans imported arrive in Europe between October and June outside the local production season. The import of fine beans from non-European countries increased from 210 000 to 241 000 tonnes from 2017 to 2021. The Netherlands and the UK offer the best opportunities and growing imports of fine beans. The UK is an essential consumer of imported fine beans. Two thirds of the beans consumed in the UK are imported. Kenya is the largest supplier to the UK followed by Morocco and Egypt. Kenya exports all year round and Morocco, Egypt and Senegal are much more seasonal. The Netherlands remains an important trade hub for exporters from developing countries. In 2021, the Netherlands imported 45 000 tonnes of fine beans from developing countries. Trade prices for fine and extra fine beans are between € 1, 50-2, 00 per kg, excluding air freight costs. Importers usually calculate a minimum profit margin of eight percent in addition to their commercial costs such as customs clearance and inspections.

Mandatory requirements

Fine beans are a high-risk product for excessive pesticide residues. Producers must avoid or minimise pesticide residues and contaminants. Pesticide residues are one of the crucial issues for fruit and vegetables suppliers. The European Union has set maximum residue levels (MRLs) for pesticides in and on food products. Fine beans containing more pesticides than allowed will be withdrawn from the market. The same applies

to contaminants such as heavy metals. Retailers in Germany, the Netherlands and Austria, use MRLs that are stricter than the MRLs laid down in the European legislation. Producers must also follow phytosanitary requirements and each consignment of exported fine beans must accompany it with a phytosanitary certificate guaranteeing that they are properly inspected, free from quarantine insects-pests and diseases and in line with the plant health requirements of the EU or country of destination. In Zimbabwe, the Plant Quarantine Services is the National Plant Protection Organisation (NPPO) that issues phytosanitary certificates.

Certification and sustainability

The common certification for fine beans is GLOBAL G.A.P. for good agricultural practices and BRCGS, IFS or similar HACCP based food safety management systems for packing and processing facilities. Producers are recommended to use Global Food Safety Initiative (GFSI) recognised food safety management systems. Sustainable and social standards are now a norm in the global fruit and vegetable markets. Besides GLOBAL G.A. P, a social certificate such as Sedex Members Ethical Trade Initiative (SMETA) or GLOBAL G.A.P. Risk Assessment on Social Practice (GRASP) are highly recommended to get your product to meet retail standards. In addition, retailers such as Tesco have their individual standards, such as Tesco Nurture (GLOBAL G.A.P. add-on) and Mark and Spencer (M&S) Field to Fork.

Organic certification is another way to set your product apart and market it at a higher price. Organic fine beans must comply with the EU organic regulations. The new Regulation (EU) 2018/848 has been in force since January 2022.

Trade Fairs

Potential exporters are recommended to attend international trade fairs have Business to Business (B2B) matchmaking. These trade fairs are held annually and help them connect with importers of fine beans. There several trade fairs that Zimbabwean exporters can participate in such as Fruit Logistica (Berlin, Germany), Mac-Frut (Rimini, Italy), Fruit Attraction (Madrid, Spain) among others.

Trade agreements

Zimbabwe had signed trade agreements with the UK and the EU such the United Kingdom Eastern Southern Africa states Economic Partnership Agreement (UK-ESA EPA) for our produce and products to enjoy duty and quota free access in the UK market. Zimbabwe is also a signatory the EU-ESA interim EPA agreement for Zimbabwean produce to be given preferential treatment through enjoying duty and quota free access. Furthermore, Zimbabwe signed trade agreements with UAE and China.

In conclusion, fine beans are a highly profitable crop and producers should take advantage of the growing demand in Europe. Investment in cold chain facilities will go a long way in ensuring high quality fine beans that are highly competitive on the European export market.

Bolton Kudzai Kakava is a Regulations and Compliance Consultant, Organic Consultant, Soil Scientist, Plant Nutrition Expert.



Sorting fine beans



Packaging

Fine beans are packed in perforated polyethylene bags or film-covered punnets in cardboard boxes or better in modified atmosphere packaging (MAP) that allow lower oxygen levels. The packaging boxes range from 2-5 kilogrammes, for example: 12 x 250 g, 6/8/10 x 500 g or 8-24 x 150-200 gramme punnets.

Call for the CAUSEWAY Women and Youth-led Agribusinesses Initiatives

(Deadline 30 April 2024).

The overall objective of the CAUSEWAY Project is to improve access to finance for Youth and Women involved in viable and scalable Agribusiness Initiatives in Peri-urban and Rural areas of Zimbabwe to sustainably undertake and implement projects that improve and increase their household incomes and food security. This will be achieved through strategic layering of various access to finance activities inclusive of training women and youth in financial literacy and business planning and proposal writing and linking the women and youth-led agribusinesses for market led funding by financial institutions (i.e. Banks and Microfinance Institutions).

The CAUSEWAY project, launched on August 1st, 2023, aims to capacitate 6,000 Youth (aged 18 to 35 Years); and 5,000 Women (aged 36 to 65 years) Agri-entrepreneurs, as well as Business Incubation and mentorship for 300 In-school Youth from selected tertiary agricultural colleges over three years (June 2023 - May 2026). The project aims to attract proposals from all ten (10) provinces in Zimbabwe, encompassing various agricultural value chains excluding Cotton and Tobacco.

In terms of eligibility, ZADT is particularly interested in applications from Youths (aged 18 to 35 Years) and Women (aged 36 to 65 years) led growth-oriented Agri-businesses that have been running for at least two (2) years and have proven to be viable, and impactful but struggling to access finance for their businesses.

ZADT therefore invites and welcomes qualifying women and youth-led agribusinesses in Zimbabwe to apply for participation in the program that will include access to finance training, mentorship, and links to financial institutions for financing.

Applications to be submitted on the following link: <https://forms.gle/RkXpVHGgFpP9szws8>
Deadline for applications: **30 April 2024**. Late submissions will not be considered.

For any enquiries phone ZADT on the following numbers:
Office Fixed Cell: +263 776 557 894/ +263 776 557 993
Fortunate Vengesai Programs Manager: +263 71 274 5350, Land Line: +263 242 303 560

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Instagram Profile: zad_tonline
You Tube: @zadt2075
Website: www.zadt.co.zw

Agriculture Reporter

HE belongs to that class of exceptional people who lead by example, set the standards embodying the principles they preach and inspire others through their actions while demonstrating integrity, dedication and unwavering commitment to their vision.

That is the Lands, Agriculture, Fisheries, Water and Rural Development Deputy Minister Davis Marapira for you! He is a man driven by passion and the willpower to succeed, as is demonstrated by his commitment to investing on his Lamote Farm in Masvingo.

Situated 10 kilometres West of Masvingo city along the highway to Zvishavane, Lamote Farm has become the theatre in which the Deputy Minister is living his dream of specialising in livestock farming. He rears cattle for beef, sheep and goats – all for commercial purposes.

And deservedly, he is the Deputy Minister responsible for livestock production in the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development. Naturally, Dep Min Marapira is doing justice to his job designation by leading from the front.

He recently added fisheries to his growing list of livestock farming activities with over two million fish in his farm dam. The farm sits on 500 hectares. The farm's boundary is demarcated right round with a state-of-the art perimeter fence that keeps nearly 400 breeding cattle for beef production, 200 sheep and 400 goats from straying into neighbouring farming communities.

In a recent interview with this publication, Dep Min Marapira revealed plans to invest in a US\$1 million dairy parlour by the end of this year. He also intends to construct at least two more dams as part of plans to expand his fisheries project. He has also secured four dairy cows from South Africa for demonstration purposes ahead of the planned dairy project. The soft-spoken Deputy Minister said was through passion for livestock production and determination to reach greater heights that pushes himself to invest on his farm.

“I am very passionate about livestock production. The determination to succeed is what continues to drive me into this venture where I have invested a significant amount of money. I am so passionate about livestock that when I am not doing my ministerial duties, I spend most of my time at the farm.

“Here (Lamote) we have almost 400 breeders that include the Beefmaster, Simbrah, which is a cross of Brahman and Simmental. We also have the White Brahman and Red Brahman and a few Simmental,” he said.

Dep Min Marapira is also developing 6 000ha of farmland in Nyahunda, Bikita District that he is renting for cattle breeding. He is mainly targeting the Simbrah breed.

Said the Deputy Minister: “We are also plan-



Exemplary leadership: A tale of inspiration and influence



ning to set up a US\$1 million milking parlour by the end of this year and as part of the build-up towards starting the project, we have already imported from South Africa four dairy cows for demonstration purposes.”

The dairy project is expected to have 1 500 cows from which 1 200 will be milked. He said that would be part of good animal husbandry practices to guarantee the best genetics for his livestock and ensure the cows successfully conceive and give birth to healthy calves. The cows are kept with at least 75 percent of their weight.

“One other thing that happens when cows do not have enough feed is that they do not get pregnant. They also do what we call forced eradication of pregnancy or they abort naturally (if they feel they cannot carry the pregnancy, they will abort naturally,” explained Dep Min Marapira.

Meanwhile, at his Lamote Farm he is using 220 hectares for various projects including pasture production through irrigation with water being drawn from Mucheke River. The other 280ha are providing pastures under dry land. The irrigation system is supported by two weirs on Mucheke River that the Deputy Minister constructed about four kilometres from the farm. He has three centre pivots for irrigation.

Deputy Minister Marapira has also drilled 15 boreholes at the farm that also serve as water reservoirs when the need arises, particularly during drought periods.

“Here (Lamote Farm), we also have sheep and goats. For the sheep, we keep the dooper breed and our numbers are not yet very reasonable to

start marketing. We have about 200 sheep and for us to be able to chase the market in Harare, we need 600 breeders at the bottom to start supplying butcheries in Harare. The same applies for our goats whose numbers are not yet ideal for commercial purposes.

“The goats we have here are local breeds crossed with the Boer goats and we have the pedigree Boer goats that we imported from South Africa. The numbers of Boer goats are slightly above 50 but the cross breeds are more than that,” he said, adding that for the aquaculture venture, about five million fish would be harvested in July this year.

Dep Min Marapira explained that he is planning to keep 10 million fish at Lamote Farm that will be sold all over the country once construction of the dams they are planning to establish is completed. At the moment they cannot take orders from the market because the volumes that some people want are still too big to be availed since the project is just taking off.

One exciting observation is that Dep Min Marapira started his cattle project with just 13 beasts. This is the herd that has been growing over the years. Of course he has also added impetus to its growth through improving the genetics of the animals.

“I did not wake up having more than a thousand cattle. In fact, I started with 13 cattle and growing their numbers over the years and improving their genetics is the most important thing. If you want to know the who's who in genetics, you come to this farm because we

house the best genetics. Even on semen, we house what we call V8 Brahman, which is an American breed that is the best globally. You can buy one straw of semen for US\$200.”

A beneficiary of the successful the land reform programme the Government embarked on in 2000, Dep Min Marapira has been at Lamote Farm since 2011. He readily acknowledges that the land reform programme is one of the country's success stories and people must remember that as they enjoy 44 years of Independence that came through a protracted struggle from white colonial rule.

“To fellow farmers, I would like to say let's invest on our farms and use the land productively. I know some people do not have money yet farming needs money. When I started in 2013 as Deputy Minister, I introduced what we call contract farming and it's still there to serve those that do not have money through partnering with investors that have money to develop their farms.

“If you cannot do that and your land remains idle and unproductive, the best thing is to surrender the farm to the State for Government to re-allocate it to someone who is productive because the economy is looking up to us as farmers.

“As I see it, agriculture has the potential to contribute 40 percent to the gross domestic product (GDP),” said Dep Min Marapira who presently employs 12 people at his farm with this figure expected to grow when the dairy project comes on board.



Peas field

Peas are one of the most strategic vegetables Zimbabweans can grow for export. Peas are a good pick if you want to grow crops that are not that hectic to deal with. Peas take on average at most, 5 months to mature (even a bit earlier). Varieties that mature faster can be ready for harvest at as early as two or two and a half month. Peas have two main types that you can pick from. Some varieties will require shelling when they have been harvested. Then some varieties do not require shelling – they are consumed as is. The scientific name for peas is *Pisum sativum*.

Importance of Peas

Peas have a lot of health benefits for human consumption. They can be eaten raw or added to a variety of dishes. Peas are laden with vitamins and antioxidants. They are good for overall heart performance. They are good for dealing with high blood pressure. They have a very high protein content – exceeding plenty of other crops in this regard. This makes them a hit with vegetarians as they can substitute meat. They are also good for regulating blood sugar levels. They promote good skin health; they are low in fat content and thus good for shedding weight. These are some of the health benefits of peas which augment their importance.

Production Considerations

Land Preparation

One of the issues to look at in land preparation is the site you choose. Peas are sensitive to the extent of sunlight exposure that they get. Essentially peas do well when they have complete exposure to the sun. It has been noted that their taste quality is diminished if they do not get full exposure to the sun. They can grow in partly shady areas but it is not wise. When preparing the soil there are two key operations to be done namely, ploughing and harrowing.

Favourable Climate

Peas prefer cold conditions to grow well. Temperatures of 21 degrees or below (starting at 13 degrees Celsius) are the best for peas farming. The best temperature is 22 degrees Celsius. Extremely hot temperatures will lead to lack of growth or hard pods. Thus here in Zimbabwe, it would be prudent to plant peas

What You Need to Know About Peas Farming

anytime in the first five months of the year.

Soil Requirements

Soil fertility is extremely important – the addition of organic material to the soil is most definitely indispensable. Roughly anything from 25 to 30 tonnes of organic material should be added to one hectare. Soil drainage is also central to good growth. If the soil does not have this attribute water logging becomes inevitable and that does not play out well for the growth of the peas. Soil pH must be in the range of 6 to 7.5. The best soil type is sandy loam – clay soils can also cut it.

Sowing and Planting

Seeds must be sown about two to three centimetres into the ground. Seed treatment (you can use Rhizobium) is highly recommended as it drives up the chances of germination. The germination process takes place within at most one week. When growing peas, you just sow directly into the soil where they will ultimately grow. Around 70 kilograms of seed is what is needed for one hectare of peas.

Water Requirements

Watering is necessary but does not overdo it – water depending on the state of the pea plants. Lack of adequate moisture will show how firm or not the plants will be. Generally, peas do not require lots of water.

Pest, Disease and Weed Control

Aphids, beetles, leaf weevils, nematodes, and leaf miners are some of the common pests to look out for. Powdery and Downy mildew are some of the common diseases to look out for. As much as you can use chemical methods to deal with pests, diseases and weeds you can still do it otherwise. Most of the pests and

diseases that affect peas can be dealt with by doing certain routine processes. For instance, getting rid of affected plants and plant debris can go a long way in pest and diseases control. Weeding should be done occasionally as informed by the state of the field.

Harvesting and Storage

Just like many other crops I have discussed, harvesting is best done early morning. Harvesting is typically done by hand and caution must be exercised to not harm the plant. The thing is, harvesting can be done progressively as and when pods mature. Thus, when harvesting, pull off the matured pods in such a way that does not harm the actual plant so that other pods get to mature unhindered. Storage is critically important because the freshness of peas is short-lived. After harvesting the peas must be put in plastics to preserve freshness. By refrigeration peas can stay fresh for almost a week – however, deep freezing lengthens the shelf life.

Important Factors to Consider

When sowing seeds, the in-row spacing should be five centimetres whereas the inter-row spacing should be 25 centi-

metres. One of the most important things to note in peas farming is the need for stacking. Just like tomatoes, they need to be supported given how they spread as they grow. Stacking can be done using any of the three approaches. One, you can stack using chicken wire mesh; two, you can use tree branches and three, you can use other crops. The third option would involve growing the peas along with other crops – a good example is maize. Stacking should be done as soon as significant growth begins to show.

Some of the common varieties to grow are Snowbird, Sabre, Serge, Alaska, and Recruit. Here in Zimbabwe, the most common variety is Sugar snap peas — this is a whole class of different varieties. Yields of anything from three to four tonnes can be realised per hectare. Some of the key export markets for peas grown in Zimbabwe are the UK, France, Netherlands, Ireland, South Africa and Canada.



AFRICAN BOLLWORM

Pest

Identification

- Fruit is mined into leaving circular holes
- Fruit matures rapidly and drops off the plants

Management and control

- Apply a fungicide spray for example Belt (flubendiamide), Denim Fit, Emma (Emamectin benzoate) and indoxacarb.
- Apply a biological such as Metarhizium, Bacillus thuringiensis var aizawai (Bt)

ANTHRACNOSE

Disease — Colletotrichum spp

Identification

Circular lesions on fruit which contain tan to orange to black concentric rings in the Centre lesions usually reach three centimetres (1,2 in) in diameter but may enlarge to cover most of the fruit surface

In some cases, the lesions are brown, not orange, and are followed by black fruiting bodies.

Management and control

- Apply disease specific fungicides, for instance, Mancozeb, Chlorotharonyl
- Deeply incorporate any plant residues into the soil

APHIDS

Pest

Identification

- Leaves affected may appear distorted or curled upward or downward
- leaf yellowing occurs, and plants maybe stunted

Management and control

Apply an insecticide, for example, Acetamid, Thiamethoxam

BACTERIAL LEAF SPOT

- Disease — Vesicatoria

Identification

- Leaf lesions begin as small, brown, water soaked spots
- As disease progresses the lesions turn brown and become necrotic at the centre

Management and control

Disease is hard to control once in the field but disease specific bactericides can be used to suppress the disease, for example, Copper based product or kasugamycin

Overhead irrigation method should be replaced with drip irrigation and the field should not be accessed when plants are wet.

BACTERIA WILT

Disease-Ralstonia Solanacearum

Identification

- Upper leaves of plant wilt on hot days and recover in the evening and early morning
- Affected leaves remain green and attached to the plant, if conditions are favourable to the development of the disease then the entire plant may wilt
- Vascular tissue in lower stems is often discoloured brown when the stem is cut open
- leaves finally die and fall off

Management and control

No curative treatment is available but remove and destroy wilted plants including roots from the field immediately infection is seen

Irrigation management: plants should not be irrigated excessively to prevent build-up of water which favours the development of the disease

Apply Trichoderma and Copper Hydroxide as preventative measures

BLOSSOM END ROT

Peppers: Pests and diseases

Disorder

Identification

- Large water-soaked spots develop at the distal end of the fruit (the blossom end)
- It then dries and turns brown or black

Management and control

Apply a Calcium based fertilizer, a foliar spray can be done for quick action

Ensure that an even and adequate water regime is maintained

BROAD MITE

Pest

Identification

- Fruit are scarred and discoloured, with premature fruit drop
- Can also attack leaves causing them to curl downward and turn purple in colour

Management and control

Apply a pest specific acaricides like Abamectin

CERCOSPORA LEAF SPOT (FROGEYE)

Disease — Cercospora Capsici

Identification

- Initial symptoms of infection are the formation of small, circular, water-soaked spots
- Spots are circular to oval with a light grey centre and a reddish-brown margin.
- Spots later become tan with a dark ring and a yellowish halo around the ring, resulting in a "frog-eye" appearance.
- The disease can affect leaves, stems, petioles and fruit

Management and control

Remove and destroy infected plants as soon as disease is noticed in the field.

Apply a disease specific fungicide e.g. Chlorothalonil, Strobilurin fungicides.

Rotate your peppers with a non Solanaceous crop like Cabbage.

DAMPING OFF

Disease-Pythium, Pytophthora, Rhizoctonia OR Fasarium

Identification

- Plant will starts dying soon after emergence they generally rot at ground level and topple over.
- Often, the stem just above the soil line is dark and shrivelled.
- If dug up, the seedling's roots are usually dark

and shrivelled too

Management and control

Avoid overcrowding seedlings especially from nursery.

Apply Fungicides containing metalaxyl, fludioxonil, dimethomorph/mancozeb

Avoid splashing of water when irrigating, using Drip irrigation is advised

Practice Crop Rotation: rotate crops of different families in each field to break the disease cycle e.g Plant cabbages after a pepper crop

NITROGEN DEFICIENCY

Disorder

Identification

Poor nitrogen uptake gives a pale colour to small plants.

Management and control

Apply the necessary compound fertiliser

Apply a nitrogen based foliar fertiliser

POWDERY MILDEW

Disease — Leveillula Taurica

Identification

- Disease commonly occurs on older leaves just

before or at fruit set

- White powdery mild on the underside of leaves, pale yellow lesion maybe seen on the upper leaf
- The edges of infected leaves may roll upwards exposing the white, powdery fungal growth

Management and control

Provide good air circulation by using correct row and intra row spacing of 50 centimetres,

Apply a Fungicide like Sulphur 80WP or Tebuconazole can be used as a systemic curative

SPIDER MITE

Pest

Identification

- Leaves appear bronzed, turn brown and eventually fall off
- Plants will have a dusty appearance to the undersides of their leaves
- Plants may also have some webbing on the underside or on the branches of plant

Management and control

Apply plant oils (neem oil).

Apply a pest specific acaricides like Abamectin

Adapted: Seedco



Kundai Zvaraya

HORTICULTURE stands as a vital pillar in Southern Africa's agricultural landscape, contributing significantly to the region's economy and food security. Zimbabwe, in particular, boasts a rich horticultural heritage, with farmers cultivating a diverse array of fruits, vegetables, and flowers. However, navigating the horticulture market system in this region presents both opportunities and challenges, especially concerning the role of middlemen, farmers' market penetration, and sustainable reinvestment of profits.

Middlemen's Influence on Prices:

Middlemen play a pivotal role in the horticulture supply chain, acting as intermediaries between farmers and consumers. While they facilitate market access for farmers, their influence on pricing can sometimes lead to disparities, with farmers receiving lower prices for their produce compared to the market value. These price differentials can erode farmers' profits and hinder their economic sustainability. Horticultural farmers cry foul of Mbare Musika prices which are usually low and don't give room for profit yet they influence the whole industry.

Tobacco farmers are also never happy with market prices considering effort required in growing the crop.

Empowering Farmers for Market Penetration:

To overcome the challenges posed by middlemen and maximize their market opportunities, horticulture farmers in Zimbabwe can adopt several strategies:

Formation of Cooperatives:

By banding together in cooperatives, farmers can aggregate their produce, gain collective bargaining power, and negotiate better prices with middlemen or directly with retailers and wholesalers.

Value Addition:

Farmers can add value to their produce by processing or packaging them into marketable products such as dried fruits, jams, or ready-to-eat salads. Value-added products often command higher prices, increasing farmers' revenue streams.

Direct Marketing:

Leveraging digital platforms and farmer's markets, farmers can bypass middlemen and establish direct connections with consumers. Direct marketing not only ensures fairer prices but also fosters relationships with consumers, leading to increased brand loyalty.

Market Research and Diversification:

Conducting market research to identify high-demand crops and niche markets can guide farmers in diversifying their produce portfolio. Diversification not only mitigates risks associated with market fluctuations but also opens up new revenue streams.

We have seen a lot of farmers lacking business principles of saving and reinvesting money after marketing crops. It has become a norm for some farmers to seek capital every season, below are some points to note.

Reinvesting Profits for Sustainable Growth:

Investing profits back into agricultural projects is crucial for farmers to sustain and grow their operations in subsequent seasons. Here are several ways farmers can reinvest their money effectively:

Infrastructure Improvement:



Rose production under green house

Maximising Profits and Sustainable Growth through horticulture

Upgrade farming infrastructure such as irrigation systems, storage facilities, and machinery to enhance efficiency, reduce labor costs, and increase productivity.

Soil Health and Fertility: Allocate funds towards soil testing and soil health management practices such as cover cropping, crop rotation, and organic amendments.

Research and Development: Allocate resources to research new farming techniques, crop varieties, and technologies that can optimize yields, reduce input costs, and mitigate risks.

Diversification: Explore opportunities for diversifying farm enterprises or introducing complementary activities such as agro-tourism, value-added processing, or livestock integration.

Training and Capacity Building: Invest in training programs, workshops, and educational resources to enhance farmers' skills and knowledge in agronomy, business management, and marketing.

Market Development: Allocate funds towards market development initiatives such as branding, packaging, and market research to increase product visibility, expand market reach, and capture higher-value market segments.

By strategically integrating these strategies, horticulture farmers in Southern Africa can strengthen their agricultural enterprises, mitigate risks, and position themselves for sustained growth and success in subsequent seasons.

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Soya beans field



Desire Tavengwa

THE Diamondback moth, also known as *Plutella xylostella*, is a common pest that attacks cruciferous vegetables such as cabbage, broccoli, and cauliflower. It is named for the diamond-shaped pattern on its back wings. The larvae of the Diamondback moth feed on the leaves of these plants, causing significant damage to crops. Farmers often use insecticides and other control measures to manage infestations of Diamondback moths in agricultural settings.

The Diamondback moth belongs to the following taxonomic classification:

Kingdom: Animalia
Phylum: Arthropoda
Class: Insecta
Order: Lepidoptera
Family: Plutellidae
Genus: *Plutella*
Species: *Plutella xylostella*

This classification places the Diamondback moth within the broader group of insects known as Lepidoptera, which includes butterflies and moths.

Diamondback moth Life Cycle

The life cycle of the Diamondback moth consists of four main stages: egg, larva, pupa, and adult. Here is an overview of each stage in the Diamondback moth life cycle:

1. Egg: The adult female Diamondback moth lays tiny, oval-shaped eggs on the underside of leaves of cruciferous plants. The eggs are usually yellowish in color and hatch within a few days, depending on environmental conditions.

2. Larva: Once the eggs hatch, the larvae emerge and begin feeding on the leaves of the host plant. The Diamondback moth larvae are green caterpillars with a distinct diamond-shaped pattern on their back. They feed voraciously and grow rapidly, causing damage to the plant.

3. Pupa: After feeding and growing to a certain size, the Diamondback moth larvae pupate by forming a cocoon or pupal case typically attached to the underside of leaves or other surfaces near the host plant. Inside the pupa, the larva undergoes metamorphosis and develops into an adult moth.

4. Adult: The adult Diamondback moth emerges from the pupa after a period of development, ready to mate and lay eggs to start the cycle again. The adult moths are small, grayish-brown in color, and have distinctive diamond-shaped markings on their wings. They are active at night and can fly long distances to find suitable host plants for egg-laying.

The entire life cycle of the Diamondback moth can be completed in as little as 3-4 weeks under favorable conditions, allowing for multiple generations to occur within a single growing season. Understanding the life cycle of the Diamondback moth is essential for implementing effective control measures to manage infestations and protect cruciferous crops from damage.

Effects of Diamondback moth in Cruciferous

The Diamondback moth can have significant negative effects on cruciferous crops due to its feeding habits. Some of the effects of Diamondback moth infestations in cruciferous vegetables

Diamondback moth – damage and control



Diamondback moth



include:

1. Defoliation: The larvae of the Diamondback moth feed on the leaves of cruciferous plants, causing extensive damage by skeletonizing the leaves. This can reduce the plant's ability to photosynthesize and negatively impact its growth and yield.

2. Reduced crop quality: Infestations of Diamondback moths can lead to reduced quality of cruciferous vegetables, including deformed or damaged produce. This can affect marketability and overall crop value.

3. Economic losses: Farmers may incur economic losses due to reduced yields and lower-quality produce resulting from Diamondback moth infestations. Additionally, the cost of controlling and managing these pests can add to the financial burden.

4. Increased susceptibility to other pests and diseases: Plants that have been weakened by Diamondback moth damage may be more susceptible to other pests and diseases, further compromising crop health and productivity.

Diamondback moth infestations in cruciferous crops can have a significant impact on agricultural production, leading to reduced yields, lower crop quality, and increased costs for farmers. Effective pest management strategies are essential to mitigate these effects and protect cruciferous crops from damage.

Diamondback Moth Damages

The Diamondback moth can cause significant damage to cruciferous crops, including cabbage, broccoli, cauliflower, and other vegetables. Some of the common types of damage caused by Diamondback moth infestations include:

1. Defoliation: The larvae of the Diamondback moth feed on the leaves of cruciferous plants, causing extensive damage by skeletonizing the leaves. This feeding behavior can result in significant defoliation, where the leaves appear lacy or have large holes, reducing the plant's ability to photosynthesize and negatively impacting growth and yield.

2. Stunting: Severe infestations of Diamond-

back moth larvae can lead to stunted growth in cruciferous plants. The feeding damage can disrupt the plant's normal growth and development, resulting in smaller, weaker plants with reduced vigor.

3. Reduced yield: Damage from Diamondback moth larvae can directly impact the yield of cruciferous crops. Plants that have been defoliated and stunted by the larvae may produce fewer and smaller heads or florets, leading to decreased harvestable yield.

4. Quality issues: Infestations of Diamondback moths can also result in quality issues with cruciferous crops. Damaged leaves, deformed heads, and contamination from larvae or their excrement can reduce the marketability and overall quality of the produce.

5. Increased susceptibility to diseases: Plants that have been weakened by Diamondback moth damage are more susceptible to other pests and diseases. The feeding wounds created by the larvae can serve as entry points for pathogens, increasing the risk of secondary infections and further compromising crop health.

Diamondback moth infestations can have a significant economic impact on cruciferous crop production, leading to reduced yields, lower-quality produce, and increased management costs. Implementing effective control measures and monitoring populations closely are essential for protecting crops from damage caused by Diamondback moths.

Diamondback Control Methods

There are several control methods that can be used to manage Diamondback moth infestations in cruciferous crops. Here are some common strategies:

Cultural control: Implementing cultural practices such as crop rotation, planting resistant varieties, and maintaining good field hygiene can help reduce Diamondback moth populations. Removing crop residues and weeds can also limit the availability of host plants for the moths.

Biological control: Introducing natural enemies of the Diamondback moth, such as parasitic wasps and predators like ladybugs and lacewings, can help keep populations in check.

Biological control agents can be an effective and environmentally friendly way to manage infestations.

Mechanical control: Handpicking and destroying Diamondback moth larvae and pupae can be an effective control method for small-scale infestations. Additionally, using physical barriers such as row covers can help protect crops from adult moths laying eggs.

Chemical control: In cases of severe infestations, insecticides may be necessary to control Diamondback moth populations. It is important to choose insecticides that are effective against the moths while minimizing harm to beneficial insects and the environment. Proper application timing and rotation of different chemical classes can help reduce the risk of resistance development.

Integrated pest management (IPM): Implementing an integrated pest management approach that combines multiple control methods, including cultural, biological, mechanical, and chemical controls, can help effectively manage Diamondback moth infestations while minimizing environmental impact and reducing reliance on pesticides. By using a combination of these control methods and monitoring Diamondback moth populations closely, farmers can effectively manage infestations and protect their cruciferous crops from damage.

As an agronomist, I would advise farmers on how to effectively manage Diamondback moth infestations in their cruciferous crops. Here are some recommendations:

Monitoring: Regularly monitor cruciferous crops for signs of Diamondback moth activity, including the presence of eggs, larvae, and feeding damage. Implement a monitoring program using pheromone traps or visual inspections to assess population levels and determine the need for control measures.

By following these recommendations and staying proactive in monitoring and managing Diamondback moth populations, farmers can protect their cruciferous crops from damage and optimize yield and quality. It is essential to tailor control measures to the specific conditions and needs of each farm to achieve effective and sustainable management of Diamondback moths.

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Farm records mandatory in taking farming as a business

Edgar Vhera

Introduction

A FARM record is a document that is used to keep track of various farm-related activities, events and materials. Farm records are key tools where the farmer may base his future decisions. A good farm record is also a tool used in assessing and mitigating farm business risks and opportunities.

This article has been prepared under the following key deliverables;

- Understand the importance of record keeping in a family farm business.
- Understand the common types of records required in a family farm business.
- Appreciate the dangers of not keeping records for a family farm business.
- Appreciate some tips for improving record keeping for a family farm business.
- Make decisions based on records.
- Demonstrate competence in design and use of appropriate farm records.

Importance of Farm Records

These play an important role of evaluating profitability and track individual enterprise performance. They also provide a basis for price setting and negotiations. Planning and decision making are made easier when past records are kept. Financiers need these documents for access to credit while contractors are increasingly demanding these to contract farmers. Among other uses of farm records are for income tax management.

Categories of farm records

1. Relating to physical records of inputs (crops and livestock), buildings and machinery.
2. Relating to production — crops grown, dates of planting and harvesting, quantity of inputs used and yields.
3. Relating to financial transactions — purchases, expenses and sales receipts.

Types of farm business records

- Income and expenditure record
- Stock record book
- Labour journal
- Sales record
- Livestock inventory
- Asset inventory
- Farm plans
- Farm diary
- Cash flow statement
- Bank statement
- Weather records

Financial records important for management

The following are the four main financial statements:

- Balance sheet
- Income statement
- Owner's equity
- Statement of cash flows

Income Statement

This can also be referred to as income and expenditure record and it shows;

- Income
- Costs incurred to produce that income
- Resulting net farm income for a certain period of time

Revenues	Source	US\$	US\$
	Total Crop Revenues	236,363	
	Total Market Livestock Revenues	252,606	
	Total Breeding Livestock Revenues	0	
	Total other Operating Revenues	133,239	
	Gross Revenues	622,208	
Operating Expenses	Total Operating Expenses	439,524	
	Operating Margin		182,684
Financing Expenses	Total Financing Expenses	26,967	
	Net Farm Income from Operations	155,717	
Other Revenue and Expense	Total Gain (Loss) on Sale of Assets	0	
	Net Miscellaneous Revenue and Expense	0	
	Net Farm Income, Accrual Adjusted	155,717	
Income Tax Expense	Income Tax Expense	0	
	Net Income before Extraordinary Items	155,717	
Extraordinary Items after tax		0	
	Net Income, Accrual Adjusted	155,717	

It gives information on whether the farm is making a profit or loss.

Structure of the Income Statement

The income statement shows among others the following;

- Revenues
- Operating expenses
- Financing expenses
- Other revenue and expenses
- Income tax expense
- Extraordinary items after tax

Summary of Income Statement

Building an Income Statement

The following information is required to come up with an income statement;

1. Cash income and expenses from farm accounting.
2. Inventory information from the inventory process.
3. Purchases and sales of inventory items.
4. Depreciation from the depreciation schedule.
5. Net Farm Income calculated.

Income and Expense Record

Date	Description	Income US\$		Expenses US\$		
		Chicken	Maize	Feed	Seed	Fertiliser
1/10/2023	Sold 2,000 birds @ US\$5/bird	10,000				
12/10/2023	Purchased 100 bags of fertiliser @ US\$30/bag					3,000
15/10/2023	Sold 20 tonnes of maize @ US\$250/tonne		5,000			
22/10/2023	Purchased maize seed @ US\$1,700/tonne				1,700	

Sales record from a maize enterprise

Harvest Date	Quantity (tonnes)	Sale Date	Quantity Sold (tonnes)	Price/tonne (US\$)	Value (US\$)	Buyer	Notes
30/3/2023	10	4/4/2011	10	200	2,000	CBD Foods	Cash
10/4/2023	6	16/4/2011	6	180	1,080	Agro Millers	Cash
TOTAL	16		16		3,080		

This is done by accountant/bookkeeper. Can hire one specifically for this purpose but you need to have your records in order.

Common livestock records

Record Type	Description
Mating Records	Taking note of female number, male number, when mated and whether aborted or not.
Farm Diary	Record of every transaction on the farm, recorded daily.
Birth Records	The date, sex and weight of offspring.
Financial Records	Record of income and expenditure.
Weather Records	Record of rainfall, temperature, humidity, among others
Death Records	Date and cause of death, if known.
Sales Records	Quantity of sale, value, and name of buyer.
Health Records	Record of vaccination, dosing and treatment.
Stock Records	Record of all animals by age and gender.

Common records for crop enterprises

Record Type	Description
Planting Records	Planting dates, inputs used (for example, quantity and type of seed and fertiliser) and labour requirements.
Farm Diary	Daily record of every transaction on the farm.
Financial Records	Record of all financial transactions (income and expenditure).
Land Use Records	Record of land preparation, conservation and other land uses.
Weather Records	Record of rainfall, temperature, humidity among others.
Maintenance Records	Record of operations such as planting, weeding, fertiliser application among others
Sales Records	Quantity of sale, value and name of buyer

Tips for improving farm record keeping

- Requires a shift in mind-set. Develop a habit to record all transactions.
- Under normal circumstances transactions through a bank are better.
- Entries should be brief and precise.

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Agriculture Commodity Prices — Mbare Market 24 April 2024		
Product	Description	Price
Potato/Pocket	Chat	US\$4-US\$5
	Small	US\$9-US\$10
	Medium	US\$11
	Large	US\$12
	Extra large	US\$13
Tomatoes	30kg sandak	US\$10-US\$18
	Wooden box	US\$2-US\$3
Vegetables	Plastic dish	US\$1
	Cabbage head	US\$0,50-US\$1
	Covo/bundle	US\$3
	Rape/bundle	US\$3
	Tsungu/bundle	US\$2
	Red cabbage	US\$1
	Beetroot/bundle	US\$1
	Muboora/bundle	US\$1-US\$2
	Onions -10kg pocket	US\$7-US\$8
	Red onion	US\$13
	Mushroom wild/bucket	
	Cauliflower/kg	US\$2-US\$2,50
	Broccoli/kg	US\$2-US\$2,50
	Ginger/kg	US\$3
	Garlic/kg	US\$2-US\$4
Turmeric/kg	US\$2-US\$2,50	
Chilli pepper	US\$2-US\$2,50	
Green pepper/kg	US\$2	
Red and Yellow pepper	US\$2-US\$2,50	
Cherry tomatoes/punnet	US\$2	
Lettuce head	US\$0,50-US\$1	
Pumpkins	US\$1-US\$4	
Jamsquash/kg	US\$4	
Egg plant/kg	US\$2	
Okra/5litre tin	US\$2-US\$3	
Parsley/head	US\$0,50	
Radish	US\$2	
Celery	US\$2	
Coriander	US\$0,25	
Fresh mint	US\$0,25	
Fresh leaches	punnet	US\$1

	White carrot/kg	US\$2
	Bottle guard	US\$1,50
	Bitter guard pannet	US\$0,50-US\$1
	Baby marrow/crate	US\$18-US\$22
Matemba	20 litre tin	US\$38-US\$43
Matemba	60 kg	US\$270
Madora	20 litre tin	US\$90
Madora	60kg	
Magandari	20l tin	US\$90
Magandari	60kg	
Sugar beans	20 litre tin	US\$35-US\$36
Soyachunks	5 kg	US\$2-US\$3
Munyemba	20 litre tin	US\$8
Munyeve	Bucket	US\$14-US\$16
Fresh munyeve		
Mutsine	Bucket	US\$14-US\$16
Dried Covo	20 litre tin	US\$8-US\$10
Dried Cabbage	20 litre tin	US\$8-US\$10
Dried fish	Small	US\$2
Dried fish	Medium	US\$4
Dried fish	Large	US\$8
Sweet potato	20 litre tin	US\$7-US\$12
Sweet potato	60kg	US\$50-US\$55
Butternuts	60 kg	US\$40-US\$45
Green pepper	60 kg	US\$15
Carrots	60KG	US\$30-US\$35
Peas	20 litre bucket	US\$60
Fine beans	60kg bag	US\$40-US\$45
Cucumber	60kg	US\$18
Magogoya	20 litre bucket	US\$7-US\$8
Magogoya	60kg bag	US\$80-US\$85
Green mealies	Dozen	US\$2,50
	Horned cucumbers	US\$10-US\$15
Apple	box	US\$18-US\$25
Avocado	basket	US\$9-US\$10
Banana	crate	US\$9-US\$11
Banana	Unripen 90kg	US\$40-US\$50
Blueberries	Crate	
Strawberry	Crate	US\$12-US\$14
Pawpaw	Each	US\$1-US\$3,50
Coconut	Single	US\$1-US\$2
Water melon	Single	US\$1-US\$3,50

Masawu	5litre tin	US\$2
Matohwe	5litre tin	
Nyii	5litre tin	US\$2
Rusika (Tamarind)	5 litre tin	US\$2
Oranges	Pocket	US\$4-US\$8
Pears	box	US\$9-US\$10
Naartigies	Box	US\$12-US\$14
Mazhanje	5l tin	
Leaches	pallet	
Peaches	box	US\$20-US\$24
Mango	20L	US\$7
Oranges	BOX	
Sweet melon	box of 7	US\$15
Grapes	Pallet	US\$1-US\$1,50
Maize grain	20 litre tin	US\$10
Maize mumhare	20 litre tin	US\$24-US\$26
Shelled groundnuts	20 litre tin	US\$20-US\$24
Fresh nzungu	20 litre tin	US\$6-US\$7
Unshelled groundnuts	Bucket	US\$6-US\$8
Nzungu mumhare	20 litre tin	US\$8-US\$10
Nyimo dried	20 litre tin	US\$23-US\$24
Fresh Nyimo	20 litre tin	US\$10-US\$14
Macadamia nuts		US\$1
Pecan nuts		US\$1
Chestnuts	pallet	US\$1
Soyabean	20 litre tin	US\$10-US\$12
Wheat	20 litre tin	US\$10-US\$12
Popcorn	20 litre tin	US\$15
Cowpeas (Nyemba)	20 litre tin	US\$10-US\$12
Sunflower	20 litre tin	US\$8-US\$12
Finger millet (Zviyo)	20 litre tin	US\$20
Mhunga	20 litre tin	US\$8-US\$10
Sorghum (mapfunde)	20 litre tin	US\$12
Shelled brown rice	20 litre tin	US\$80

Unshelled brown rice	20 litre tin	US\$50
Broiler Ordinary		US\$5-US\$6
Broiler Mother		US\$9-US\$10
Road runner hens	each	US\$6-US\$7
Road runner cocks	each	US\$10
Guinea fowl (hanga)	each	US\$6-US\$7
Ducks	each	US\$8-US\$10
Turkey	each	US\$15-US\$20
Pigeons	each	US\$2-US\$2,50
Rabbits	each	US\$8-US\$12
Eggs (small)	crate	US\$3,50
Eggs (medium)	crate	US\$3,80
Eggs (large)	crate	US\$4,20
Roadrunner eggs	crate	US\$3-US\$3,50
Refined cooking oil; palm oil, Sunflower	2litre	US\$3
Maheu	packet	US\$2
Meal-meal	10kg	US\$6-US\$7
Dovi	1 litre	US\$2-US\$2,50
Chimera	5l tin	US\$4
Finger millet meal	5l tin	US\$6-US\$8
Sorghum meal	5l tin	US\$6
Millet meal	5l tin	US\$6
Wheat meal	5l tin	US\$6
Soya meal	5l tin	US\$6
Cassava meal	5l tin	US\$8
Rice meal	5l tin	US\$10
Tealeaves tangada	20l tin	US\$18
Makoni tea leaves	5l tin	US\$1-US\$2

Market information comes to you courtesy of The Herald & eMKambo 0772137717

Worm compost can be a cheap source of nutrients for many different agricultural and horticultural applications. It is also an easy way to not just getting rid of food and paper waste, but converting it to good use at the same time.

The following methodology to create worm compost to be very useful (source). Different types of bedding materials as well as food sources will be experimented with.

How You Do It

Buy or build a box with holes in the bottom. Fill the box with moistened bedding. Add the redworms. Pull aside some of the bedding, bury the food waste and cover it up with the bedding. Add one cup of soil or sand to provide grit for worms' digestive process.

What You Need

1. a container (made of wood or plastic)
2. worms (500-2,000 redworms)
3. bedding (shredded newspaper, corrugated cardboard and/or leaves)
4. food waste (fruit and vegetable waste)

1. The Container

Buy or build a container or use an old dresser drawer, trunk or barrel. Wood containers are absorbent and good insulators for worms. Plastic containers do work but compost tends to get quite wet.

The container should be between 8-12 inches deep and provide one square foot of surface area for every pound of food waste per week (e.g., 6 lbs of waste requires a bin 2 feet by 3 feet or 2 bins 1 foot by 3 feet).

Depending on the container's size, drill 8 to 12 holes (3/16- 1/4 ") in the bottom for aeration and drainage. A plastic bin may need more drainage — if contents get too wet, drill more holes. Raise the bin on bricks or wooden blocks for air circulation. Place a tray underneath to capture excess liquid, which can be used as liquid plant fertilizer.

Worms like a moist, dark environment. Their bodies are 75 to 90 per cent water and worms' body surfaces must be moist

for them to breathe. Cover the bin to conserve moisture and provide darkness. Indoors, place a sheet of dark plastic or burlap sacking on top of the bedding. Outdoors, use a solid lid to keep out unwanted scavengers and rain.

Worm bins can be located in the basement, shed, garage, balcony or kitchen counter. They need to be kept out of the hot sun, heavy rain and cold. When temperatures drop below 40 degrees, bins should be indoors, heated or well-insulated. The container can be heated with an electric heating cable placed in the bottom third of the container. To insulate, surround the container with rigid Styrofoam.

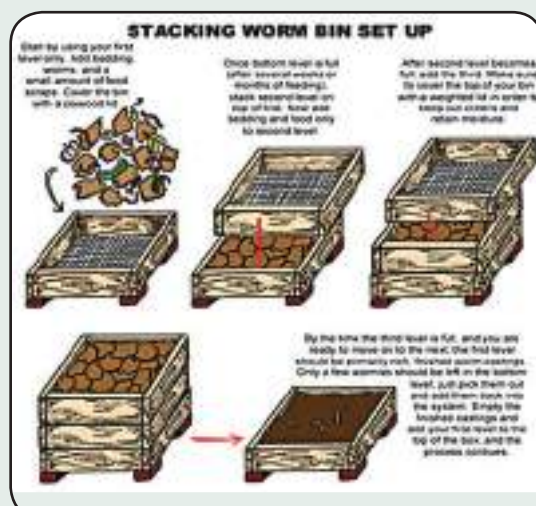
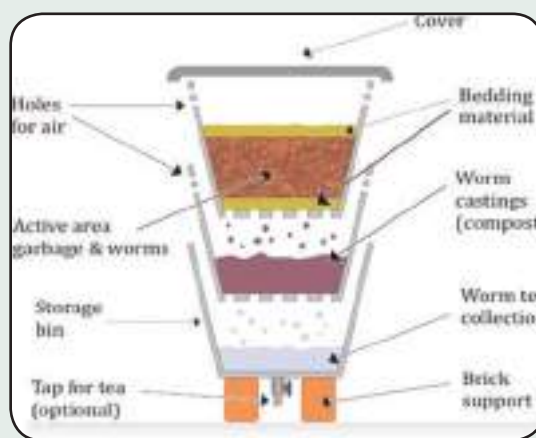
2. The Worms

Redworms are best suited to worm composting. They are often found in aged manure, compost heaps, and piles of leaves. They are also known as red wiggler, brandling and manure worms. Their official names are Eisenia foetida and Lumbricus rubellus. Redworms are best suited for composting because they thrive on organic material, such as food waste. Dew-worms, on the other hand, are better suited to life in the soil and shouldn't be used in a worm bin.

You can get your worms from a compost bin, purchase them or find a horse stable or farmer with an aged manure pile.

For one pound per day of food waste, you'll need two pounds of worms (roughly 2,000). If you are unable to get this many worms at the start, reduce the amount of food waste until the population increases. And the population will increase. Redworms mature sexually in 60-90 days and can then produce cocoons which take 21 days to hatch baby worms. Once they start breeding

they can deposit two to three cocoons per week with two baby worms in each cocoon.



The limits on their reproduction include availability of food and room to move and breed. So worm populations don't usually exceed the

size of the container.

3. The Bedding

Provide damp bedding. Suitable bedding material includes shredded newspaper and cardboard, shredded fall leaves, chopped-up straw and other dead plants, seaweed, sawdust, dried grass clippings, aged manure and peat moss. Peat moss is quite acidic and should be well soaked and combined with other bedding material. Vary the bedding in the bin to provide more nutrients for the worms and to create a richer compost. Two handfuls of sand or soil will provide the necessary grit for worms' digestion of food.

Fill the bin with a mixture of damp bedding so the overall moisture level is like a "wrung-out sponge." Lift the bedding gently to create air spaces. This maintains aerobic activity, helps control odors and gives the worms freer movement.

4. The Food Waste

Your worms will eat food scraps such as fruit and vegetable peels, pulverized egg shells, tea bags and coffee grounds. To avoid potential rodent problems do not compost meats, dairy products, oily foods or grains. No glass, plastic or tin foil. Pull aside the bedding, bury the food waste deep and then cover it up with the bedding again. Divide the bin into three or four imaginary sections (larger bin, more sections) and bury successive loads in different locations in the bin.

Keeping a chart of burial sites can be helpful. Weekly food waste will help determine the size of bin and number of worms you'll need. Collect food waste in a container and weigh it. Do this for two weeks to get an estimate of average food waste. Your bin should provide one square foot of surface area for every pound of food waste per week. And you will need two pounds of worms for every pound of food waste per day.