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El Niño versus small-scale farmers



Kundai Zvaraya

Kundai Zvaraya

El Niño is a climate pattern that occurs in the Pacific Ocean. It is characterised by warmer-than-normal water temperatures in the central and eastern Pacific Ocean. El Niño can have a significant impact on weather patterns around the world, including in Africa. During El Niño, rainfall patterns in Africa can change dramatically, leading to floods or droughts. El Niño is a natural phenomenon, but it can have devastating consequences for farmers who are not prepared for the changes in weather. How familiar is the reader with El Niño's impact on agriculture in Africa?

The impact of El Niño on agriculture in Africa can be significant. For example, during El Niño years, parts of Southern Africa may experience extreme droughts, while East Africa may experience floods. This can have a devastating effect on crops, leading to reduced yields and food insecurity.

El Niño can also affect livestock, as animals may not have enough to eat or may be vulnerable to disease due to the changes in weather patterns. In addition, El Niño can increase the risk of pests and diseases, as insects and pathogens thrive in the warmer, wetter conditions. All of these factors can have a major impact on farmers' livelihoods.

El Niño has a significant impact on Southern Africa, particularly on countries like Zimbabwe, Angola, Botswana, Malawi, Mozambique, Namibia, South Africa, Swaziland, and Zambia.

These countries are vulnerable to drought and floods, and these events can cause food insecurity and other problems. For example, during the El Niño of 2015-2016, millions of people in Southern Africa experienced food insecurity and malnutrition. The impact of El Niño on Southern Africa can be devastating, and it can cause long-term damage to the region's economy and food security.

As mentioned, the impact of El Niño on agriculture in Africa can be significant. One of the biggest impacts is on crop yields. During El Niño years, crop yields can be reduced by up to 30 percent in some areas. This can lead to a loss of income for farmers and can also cause food shortages. In addition, El Niño can cause livestock losses due to increased disease and poor nutrition. Overall, El Niño can have a devastating effect on the agricultural sector in Africa, leading to poverty and increased food insecurity.

What can small holder farmers do in the face of El Niño?

In the face of El Niño, smallholder farmers can take a number of steps to protect their crops and livelihoods. First, farmers can adopt drought-resistant crop varieties, such as sorghum, millet, and cassava. They can also plant crops early to take advantage of the early rains and use mulching and water harvesting techniques to conserve water.

In addition, farmers can diversify their income sources to include livestock and off-farm activities, and they can seek out micro-credit or government support to help them weather the drought. Lastly, farmers can join farmer organisations and work together to share information and resources.

... aftermath of first significant rains



El Niño can have a significant impact on weather patterns around the world

Can farmers plant with early rains during El Niño?

Yes, farmers can plant crops during the early significant rains that are associated with El Niño. In fact, planting crops early during El Niño is often the best strategy for smallholder farmers, as it can help them take advantage of the extra rainfall and protect their crops from the extreme drought that often follows El Niño. When planting early, farmers should choose crops that are drought-resistant, such as millet, sorghum, and cassava, and they should prepare the soil by adding organic matter and nutrients.

How can farmers prepare in time so when early rains come they will not miss planting?

In order to prepare for the early rains during El Niño, farmers should first pay close attention to the weather forecasts and the advice of local experts. Then, they can make sure they have the seeds and tools they need to plant in time. Farmers can also create a planting calendar so they know when to plant

each crop, and they can prepare their land in advance by removing weeds and debris and adding organic matter. It's also important for farmers to have access to irrigation, so they can water their crops during the dry periods that often follow the early rains.

What to do when first significant rains come during El Niño?

When the first significant rains of El Niño arrive, farmers should do several things to make the most of the rain and protect their crops. First, farmers should plant the crops that are most likely to benefit from the early rains, such as millet and sorghum. Second, farmers should make sure their land is well-prepared by removing weeds and adding organic matter. Third, farmers should mulch their crops to retain moisture and suppress weeds. Fourth, farmers should plant in raised beds or terraces to prevent erosion and conserve water.

1. Choosing the right crops is critical.

Crops like millet and sorghum are resilient in the face of drought, as they need less water than other crops, and they can be planted early. Crops like beans, groundnuts, and pigeon peas can also be planted early and benefit from the extra rainfall.

2. Preparing the land is crucial.

Clearing the land of weeds and rocks and adding organic matter like compost or manure can improve soil fertility and moisture retention.

3. Mulching is an important step in protecting crops during El Niño.

Mulching helps to prevent soil erosion, suppress weeds, conserve moisture, and keep the soil cool. There are many types of mulch that can be used, including straw, grass clippings, leaves, and even black plastic.

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El Niño versus small-scale farmers

♦ From Page 2

- 4 Planting on raised beds or terraces is another important way to protect crops from erosion and help retain moisture during El Niño.

Raised beds are particularly effective because they allow water to drain away from the plants' roots, preventing the roots from becoming waterlogged. Terraces also slow down the flow of water.

How to maintain that crop after rains are gone?

After the rains are gone, it's important to continue taking care of the crops. First, it's important to keep the soil moist by using mulch and water-conserving irrigation techniques. Second, it's important to monitor the crops for pests and diseases and take action if necessary.

Third, it's important to harvest the crops at the right time to maximise yield and quality. And finally, it's important to store the harvested crops properly to prevent spoilage.

To expand on the above practices, let's take a closer look at each one.

- Mulching is a crucial practice for maintaining crops after the rains have gone. Mulching helps to keep the soil moist and prevents it from drying out. It also suppresses weeds and prevents evaporation from the soil surface. There are many types of mulch that can be used, including hay, straw, and leaves.
- Water-conserving irrigation techniques are another important practice for maintaining crops after the rains have

gone. Drip irrigation, which delivers water slowly and directly to the roots of the plants, is an effective technique.

Moving on, we can talk about monitoring crops for pests and diseases. Pest and disease occurrence in crops increases during El Niño. This is an important practice because pests and diseases can cause significant damage to crops and reduce yields. Some pests and diseases to watch out for include leafhoppers, aphids, spider mites, and bacterial wilt. These pests and diseases can be controlled using a variety of methods, such as biological control, physical barriers, and chemicals. It's important to consult with an agricultural extension agent or other expert to determine the best control method for the specific pest or disease.

Overall, it is difficult to successfully grow crops during El Niño and its rainfall patterns. Relying on rain fed is becoming difficult as the effects of Climate Change continue to torture smallholder farmers. We highly recommend smallholder farmers and organisations that support them to invest in supplementary irrigation for better food security.

There are a number of solutions that can help farmers in Southern Africa during El Niño. One is to improve the quality and quantity of climate information available to farmers, so they can make informed decisions about when and what to plant. Another solution is to develop more drought-resistant crop varieties, so that farmers can continue to grow crops even during drought conditions.

Another solution is to improve irrigation systems, so that farmers can access water



Pest and disease occurrence in crops increases during El Niño

even during dry periods. Finally, there are a number of policies that can be implemented to help farmers, such as disaster relief funds and agricultural insurance schemes.

The uncertainty of the rains has a toll on mental, physical and social wellbeing of smallholder subsistence farmers across Zim-

babwe and we keep trying to provide information and prepare them for this unfortunate weather pattern. The goal is to ensure they get something from their fields.

Kundai Zvaraya, Founder of Farm Makeover, +263 78 496 4045



RBZ GOLD-BACKED DIGITAL TOKENS ISSUE NO. 22/2023 RESULTS

The Reserve Bank of Zimbabwe would like to notify the public of the results of the RBZ Gold-backed Digital Tokens Issue No. 22/2023 held on Thursday, 21 December 2023. The Bank received 20 applications valued at ZW\$ 16,539,795,407.70 and US\$ 165.98 to purchase gold-backed digital tokens and the full amount was allotted.

The details of the results are as follows:

	ZW\$	US\$
Date of Issue	21 December 2023	21 December 2023
Number of Bids Received	19	1
Value of Bids Received	16,539,795,407.70	165.98
Amount Allotted	16,539,795,407.70	165.98
Price per Milligram of Gold	448.65	0.0687
Milligrams of Gold Purchased	36,865,698	2,416

Total milligrams of gold purchased: 36,868,114 (36.87 kgs of gold)

Cumulative milligrams purchased 447,626,824.00 (447.63 kgs of gold)

RBZ GOLD-BACKED DIGITAL TOKENS ISSUE NO 01/2024

Applications under the twenty-third issuance of the RBZ gold-backed digital tokens should be submitted through the banks during the week for settlement and issuance on Thursday 11 January 2024.

RESERVE BANK OF ZIMBABWE
21 DECEMBER 2023



RBZ GOLD-BACKED DIGITAL TOKENS No. 01/2024 APPLICATION FORM

The Director, Financial Markets
Reserve Bank of Zimbabwe
80 Samora Machel Avenue
P.O. Box 1283
HARARE

...../.....2023

Dear Sir

I/We hereby irrevocably apply for the RBZ Gold-Backed Digital Tokens 01/2024 as (tick below):

Individual	<input type="checkbox"/>
Corporate	<input type="checkbox"/>

Bank	<input type="text"/>
Account Number	<input type="text"/>

CURRENCY OF SETTLEMENT (Tick Below)

Currency	<input type="checkbox"/> ZW\$	<input type="checkbox"/> US\$
Amount (Figures)	<input type="text"/>	<input type="text"/>

AMOUNT (words).....

Signed at this..... day of 2023

Yours faithfully,

Full Name & Address

Phone.....Cell

e-mail.....

Editor's Note



I HOPE this edition of the Agriculture Journal finds you well and helps renew your appreciation for the remarkable world of farming. The festive mood for Christmas has come and gone. Now we are in a new year. A year saddled with many issues that you have to contend with in your line of duty.

It is obvious you all saw what the El Nino phenomenon is capable of in frustrating your ambitions as a farmer. I know you have been bombarded by innumerable pieces

of advice on how you can reduce its impact on both your crops and livestock and my firm belief is that you did most of what was recommended.

I know that the Government did not leave any stone unturned in the search for something that could help you tame the harsh impact of the drought that comes with El Nino. At this point I guess you have also realised that the success of any of the proffered solutions for mitigating drought effects is only achievable if you implement the instruction to the last letter. You also have some home-grown solutions that you grew up watching your predecessors implementing.

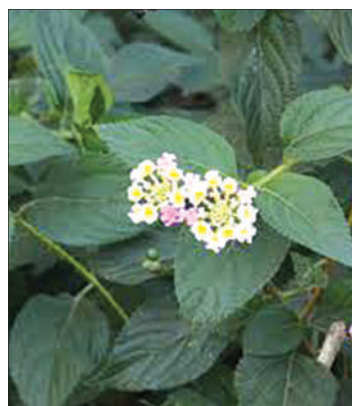
Remember the Pfumvudza/Intwasa programme that is currently making waves has been practiced since time immemorial but minus the business approach that we have now adopted where we count the number of planting stations, the plants per station and the cobs per plant, then the kernels per cob before calculating your requirements as a family and marking the surplus for the market.

This programme has been used successfully by those that did not have draft power and they managed to feed their families effectively, thanks to its ability to cushion crops from harsh weather. The farmers, then, would diligently monitor their crops for any signs of disturbance by pests or diseases and would immediately act upon spotting anything unusual. That is what you must also do.

Scout your crops regularly for the African armyworm and the Fall armyworm as well because this is their breeding season that we are going through. If you let your guard down and give the pests a chance to feed on your crop, then the result is obvious — you will lose a lot of yields if not entire crop batches, which will leave you with no yields to talk about.

I sincerely hope you managed your spending shrewdly during the festive season and made sure you have some cash for contingency stacked somewhere waiting to be used as soon as you deem it necessary. Remember, it is always easier for you to look for additional funding to take care for an emergency than to start searching from scratch.

Wishing you a successful 2023/24 cropping season!
ENJOY!!!



Lantana Camara



Poisonous plants can kill cattle



Rosea-Cactus-plant-in-Gwanda

Drought spells and the rising risks of livestock poisoning



Eddington Gororo

DROUGHTS are associated with high risks of livestock poisoning from some of plant species they come across as they graze. As the availability of desirable forages decreases, animals resort to eating anything that looks green, including less appropriate forages and plants that they would not normally consume in large quantities. During drought, stocking rates should be reduced in line with reduced forage yields and growth rates. However, managers tend to over-stock the land, such that selective grazing by livestock becomes impossible. Livestock that have limited access to water will seek out succulent plants, most of which may be toxic. For these reasons the likelihood of poisoning can increase during periods of drought.

Drought stress triggers physiological responses in forage plants, including the production of toxic secondary metabolites. These compounds may accumulate at higher than typical concentrations, as a defence mechanism or as a result of altered metabolic processes.

The adverse effects of drought stressed plants depends on the plant species, type of toxin, and whether the toxicological action is recurring, building up over time, or acute — that is, has fast action and impact. When the veld turns toxic, farm losses are related to poor animal health and condition, reproductive failure (for example, abortion, stillbirths, birth defects and conception failure), and deaths of animals. Livestock keepers may suffer further financial losses through the cost of treatment.

1 Types of plant poison

There are different types of plant poisoning that may happen during dry spells or droughts. The most common metabolites that may be poisonous include nitrates, cyanogenic glycosides, oxalates, and other harmful substances.

Nitrate poisoning

Nitrate poisoning is a great risk when animals are let to feed on drought stressed crops that contain toxic levels of nitrate. This is a problem with wilted maize and sorghum crops that received nitrogen fertiliser. When livestock consume these plants, nitrates can be converted into toxic nitrites in their digestive system. Nitrites interfere with physiological oxygen transport, leading to symptoms like laboured breathing, weakness, and death.

Prussic acid poisoning

Prussic acid, also known as hydrogen cyanide, is a highly toxic compound that can be found in certain plants. Crops such as sorghum can accumulate cyanogenic compounds during dry spells or drought periods. Risk of prussic acid poisoning is also greater with frosted or wilted lush green grass. When ingested into the animals' body, cyanide causes a rapid onset of toxicity symptoms including difficulty breathing, convulsions, and sudden death.

Oxalate Poisoning

Certain species of oxalis and pigweed contain high levels of oxalates. During drought spells, these plants may become more palatable to livestock. When consumed in large quantities, the active oxalates may interfere with calcium metabolism. Symptoms of oxalate poisoning include weakness, tremors, and kidney damage.

Photosensitisation

Certain plants contain compounds known as photosensitising agents. Livestock do not normally graze such plants. However, during dry spells, anything green goes. When exposed to sunlight, the photosensitising agents react with the skin, causing severe sunburn and tissue damage to affected animals develop skin lesions and swellings, and will experience pain and discomfort.

2. Preventive measures

To mitigate the risk of plant poisoning, it is crucial to supplement the limited grazing available by providing alternative feed sources such as hay or silage. Regular scouting of grazing areas to identify and rogue out these toxic plants may also help to combat toxicity challenges. Zimbabwian plant species such as *Datura stramonium* (thorn apple), *Strychnos nux-vomica*, *Solanum incanum*, *Lantana camara* and *Dipetulum cymo-*

sum, among others, are known to be toxic to livestock.

In addition, farmers must avoid pushing grazing livestock into failed or wilted fields of cereal crops such as maize and sorghum, unless the risk level has been assessed to be low. In any case, drought failed crops must be grazed or utilised with caution.

3. Treatment approaches

Dealing with cases of plant poisoning in cattle, goats, and sheep requires prompt action to minimise loss of animals and provide appropriate treatment. If plant poisoning is suspected, the immediate response must be removal of affected animals from the pasture or area where they were grazing. This will prevent further ingestion and exposure to the toxic compounds.

A general antidote such as activated charcoal may be administered orally to help absorb and decrease the absorption of toxins from the gastro-intestinal tract. However, it is not suitable or effective against all types of plant poisons. Therefore, farmers should seek professional veterinary assistance as soon as possible. The vet will assess the situation, identify the toxic plant involved, and provide appropriate guidance for specific treatment.

As a general guide, the farm vet cupboard must always be stocked with an assortment of purgatives and astringents such as molasses, activated charcoal, liquid paraffin, Epsom salts, kaolin powder, vinegar, and Hypo (sodium thio-sulphate). It is important for the farmer to know when and how to use each of these remedies.

4. Conclusions

During dry spells, plant poisoning can pose a significant threat to livestock. Livestock owners must be aware of toxic plants present in their area and take preventive measures to avoid animals grazing such plants or failed cereal crops during dry spells. Farmers are urged to work closely with their veterinarian or animal specialist to save foraging livestock from plant poisoning-related deaths.

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Nyasha Muchemeyi

Managing diseases during the transition from winter to summer

AS the seasons change, so do the management practices of livestock. During the transition from summer to winter, you must adjust your practices to accommodate for the changing needs of your animals. This can include changes in feed, water, and shelter, as well as increased vigilance for signs of illness or disease. With proper management, livestock can thrive through the changing seasons and continue to provide for their owners.

The management practices for livestock during the transition from winter to summer in Zimbabwe include:

- 1. Shelter:** Ensure that the livestock have access to proper shelter to protect them from extreme temperatures, strong wind, and rain. This can be achieved through barns, sheds, or proper housing structures.
- 2. Water Supply:** Ensure a sufficient and clean water supply for the livestock. In summer, the heat can lead to increased water requirements, so make sure to provide ample water sources and check on them regularly.
- 3. Nutrition:** Adjust the diet of livestock according to the changing seasons. In winter, animals may require additional feed to maintain their body temperature, while in summer, grazing areas and availability of fresh green pasture can be maximized.
- 4. Disease Prevention:** Implement proper disease prevention measures, including vaccination programs tailored to the specific diseases that may be prevalent during the summer season. Work closely with a veterinarian to develop a comprehensive disease management plan for the livestock.
- 5. Parasite Control:** Increase vigilance against parasites such as ticks and mites that tend to proliferate during warmer temperatures. Use appropriate treatments and keep the livestock clean to minimise infestations.
- 6. Heat Stress Management:** Take measures to combat and prevent heat stress in livestock. This can include providing shaded areas, using sprinklers or misting systems to cool the animals, and adjusting the timing of activities to avoid the hottest parts of the day.
- 7. Monitoring:** Regularly monitor the movement of livestock. It is also important to consider the impact of climate change on livestock management practices, as well as the economic and social factors that influence the choices farmers make.

Transitioning from winter to summer requires careful management of livestock to prevent and address potential health issues. Here are some disease management practices that you can consider:

- 1. Vaccination:** Ensure that your livestock's vac-



The management practices for livestock during the transition from winter to summer reduces risk of livestock disease outbreak

cinations are up to date, especially for diseases prevalent during the summer months. Consult with a veterinarian to determine the appropriate vaccines for your specific livestock and regional disease risks.

- 2. Parasite Control:** Warmer temperatures can increase the prevalence of parasites such as ticks, flies, and worms. Implement a strategic parasite control program, including deworming protocols, fly control methods (e.g., sprays, insecticide-treated ear tags), and proper manure management to minimize parasite burdens.
- 3. Nutrition:** Adjust the livestock feed according to their changing nutritional requirements during the transition to summer. Consult with a nutritionist or veterinarian to develop a balanced feeding plan that meets the specific needs of your livestock.
- 4. Hydration and Water Quality:** Ensure a consistent supply of clean, fresh water to prevent dehydration, especially during hot weather. Regularly check water sources, clean troughs, and monitor for waterborne diseases.
- 5. Heat Stress Management:** Livestock are susceptible to heat stress during the summer months. Provide shaded areas, adequate ventilation, and access to cool drinking water to help animals regulate their body temperature. Consider installing fans or misting systems in barns or provide access to ponds or sprinklers for livestock to cool off.
- 6. Monitoring Animal Health:** Regularly inspect livestock for signs of illness, injury, or behav-

ioural changes. Early detection and prompt treatment can prevent the spread of diseases and improve recovery rates. Maintain accurate records of any health issues or treatments for future reference.

- 7. Biosecurity Measures:** Implement biosecurity measures to prevent the introduction and spread of diseases. Control livestock movements, limit contact with other farms/animals, and maintain proper sanitation practices to reduce the risk of disease transmission.
- 8. Consult Veterinarians:** Regularly consult with a veterinarian who can provide specific guidance based on the needs of your livestock, local disease patterns, and any emerging health risks. Remember, it is crucial to adapt these practices based on the specific needs and conditions of your livestock. Additionally, consulting with local agricultural experts or veterinarians can provide valuable insights tailored to the Zimbabwean context.

What is the importance of managing livestock diseases during transition from winter to summer?

Disease management practices for livestock during the transition from winter to summer are vital for several reasons:

- 1. Preventing Disease Outbreaks:** The transition period can create a favorable environment for the spread of diseases due to changes in temperature, humidity, and the presence of vectors such as insects. Proper disease man-

agement practices help minimize the risk of outbreaks and reduce the chances of disease transmission among livestock.

- 2. Animal Health and Welfare:** Implementing disease management practices ensures the overall health and well-being of livestock. Prompt detection, prevention, and treatment of diseases help minimise unnecessary suffering and promote better animal welfare.
- 3. Maintaining Productivity:** Healthy animals are more likely to exhibit optimal growth rates, reproductive performance, and milk or meat production. Disease management practices help prevent or mitigate the impact of diseases on livestock productivity, resulting in improved economic outcomes for farmers.
- 4. Cost-Effective Approach:** Implementing disease management practices is a proactive approach that can minimise the need for expensive treatments, emergency interventions, and potential losses associated with disease outbreaks. Preventing diseases is often more cost-effective than treating or managing them once they occur.
- 5. Protecting Herd Health:** Proper disease management is essential for maintaining the health of the entire herd or flock. By implementing vaccination programmes, parasite control measures, and appropriate nutrition, the risk of contagious diseases can be significantly reduced, minimising the impact on overall herd health.
- 6. Biosecurity and Herd Integrity:** Disease management practices, including biosecurity measures, help protect livestock from the introduction of new diseases. By implementing protocols such as quarantine, limiting contact with other animals, and maintaining good sanitation practices, the risk of introducing and spreading diseases within the herd can be minimised.
- 7. Sustainability and Environmental Impact:** Effective disease management practices contribute to sustainable livestock production by reducing the need for antimicrobial treatments and minimising the environmental impact of diseases, such as the spread of pathogens in the environment.

Overall, disease management practices during the transition from winter to summer play a crucial role in ensuring the health, welfare, and productivity of livestock. By implementing preventive measures, proper nutrition, and regular veterinary care, farmers can mitigate the risk of diseases and maintain a healthy and thriving livestock population.

Nyasha Muchemeyi is a student at the University of Zimbabwe

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Selecting breeding stock

AFTER choosing the appropriate breed to rear, it is important to select the animals that will be used in the breeding programme, based on specific selection criteria.

Health

The animals should be healthy. Look for the following signs of good health in breeding rabbits:

Smooth and shiny coat, standing ears, clear eyes and silent breathing

The animal should not have crusts of mange (scabies) around the nose, eyes and edges of the ears or inside ears as a dirty mass.

Inspect the anus for soiling due to diarrhoea

Inspect the front legs and nose area. Dirty front legs and/or dirty nose may indicate problems with coughing (Pasteurellosis) since rabbits wipe their nose with their front legs

Palpate the stomach/abdomen. It should feel soft and smooth. A spongy feeling may indicate some intestinal problem

Put animal on the ground and watch for irregular leg movements

Reproductive rate

Rabbits can reach sexual maturity at four months of age. However, age of sexual maturity is greatly influenced by weight of the animal. In most cases, sexual maturity reached when 75-80 percent of mature body weight is achieved it is advisable to start mating rabbits at:

- 5 to 6 months for light breeds
- 6 to 7 months for medium breeds
- 9 to 12 months for heavy breeds

Underfeeding, feeding low quality feeds and poor health can delay the age of sexual maturity. Breeding management should aim for:

- Litter sizes ranging from 4-12 bunnies.
- However, litter size of 8 - 12 is considered commercially viable.
- At least 4-6 kindlings per year. Bunnies should be healthy and does re-mated 3-4 weeks after giving birth
- High growth rate and meat to bone ratio. This usually is a function of breed
- Using both breeding does and bucks for 2 to 3 years. Breeding can take place all year round.

Sexing of young animals

The sexing of young animals is not easy. Older males have two big testes. Avoid using males with one testes because this condition is hereditary. The following procedure is used in sexing:

- Hold the rabbit on its back with your left hand (if you are right handed) or right hand (if left handed),
- Put one finger of the other hand on the tail side of the genital apparatus and one on the abdominal side
- Press down gently and stretch the organ; if it is a doe a long slit will appear, if it is a buck a small curved penis will show.

Source of breeding stock

Avoid buying at market places where no guarantees can be given market places can also be a source of disease spread. Besides, farmers usually sell their non performing animals.

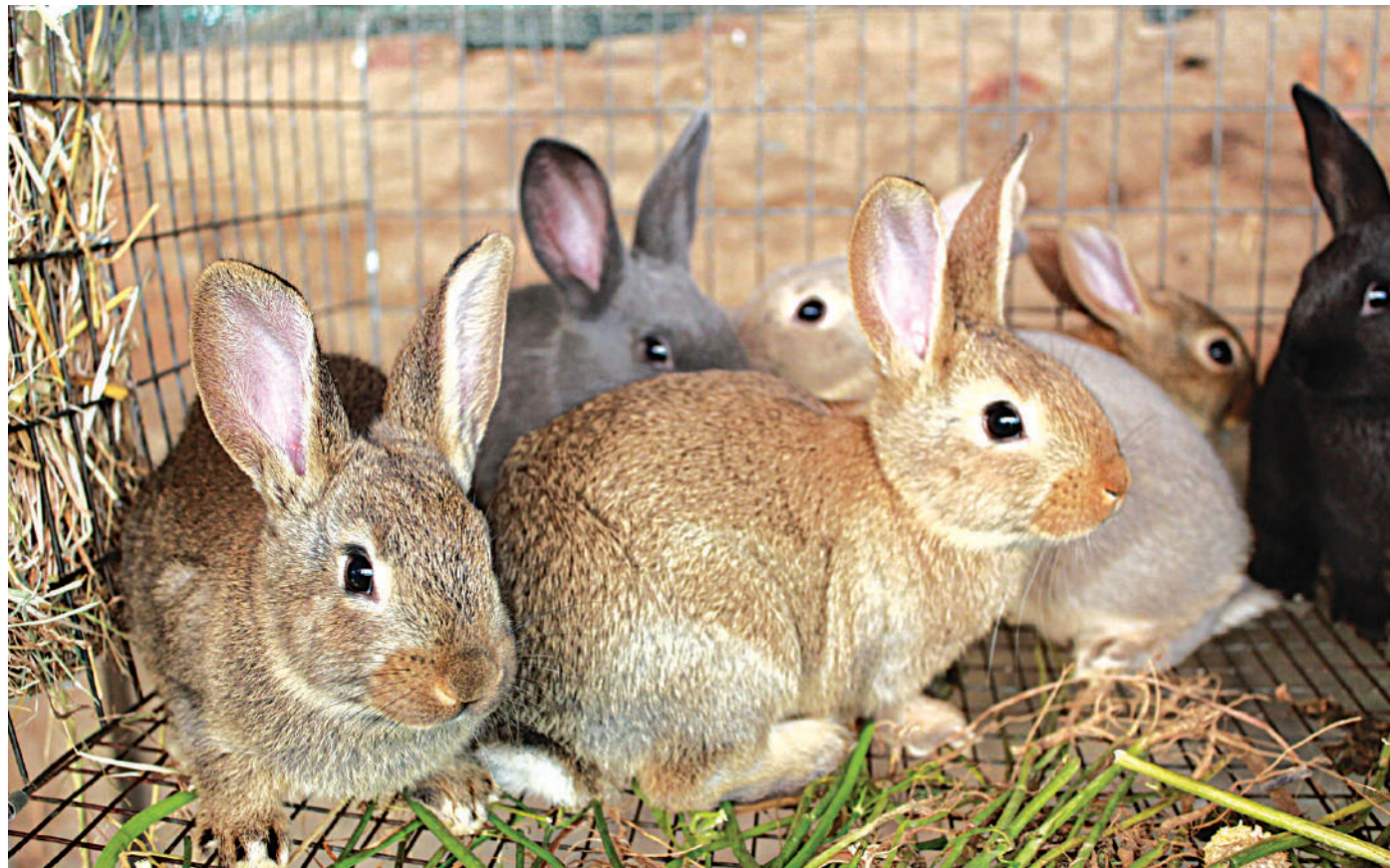
Rule of thumb:

Only purchase/acquire breeding rabbits from reputable breeders with good breeding records

Breeding does

Does can be mated at any time after they reach sexual maturity as long as they are not pregnant. Rabbits do not have a clear reproductive cycle but the doe has periods during

Managing rabbits' reproductive environment



Rabbits are considered pets in many African societies, However, their economic value as a source of meat, fur, animals for medical research, and other products is apparent

which they exhibit greater willingness to mate. The doe can be put with the buck at any time as the egg will come free after mating. A doe maintained in good health will ideally produce litter until they are 2, 5 to 3 years of age.

Rule of thumb:

Does should be mated only if they have eight functional teats and weigh at least 3, 6 kg.

Breeding bucks

Mature bucks can have a maximum of seven mating times per week whereas the younger growing ones can have of two mating times per week.

Rule of thumb:

- Always mate a buck early in the morning when it is cool since its libido is usually high in the mornings. Bucks can however be mated at any other times but with diminishing success.
- One buck should be able to service 10 to 12 does.
- Sometimes the male is given a round hutch/stable so that the doe does not sit with her hind end in a corner, which can make mating difficult.

Conditions which can cause infertility

Rabbit producers should be on the look-out for conditions that can lead to reduced fertility. These include:

- Obesity and poor body condition. Overweight or underfed does fail to reproduce and may abort.
- Concurrent disease, for example, pasteurella infection
- Age of animals-animals older than three years may become infertile
- High ambient temperature — heat stress

reduces fertility

Mating

There is no definite heat period for the non-pregnant doe and she can accept the buck at any time. When she is ready for mating the doe becomes restless, stamps its feet on the floor and will accept mounting by the buck Mating can be considered to have taken place when the male falls aside or backwards after mounting the doe.

- As a rule of thumb, when mating rabbits,
- Always take the doe to the buck's cage for mating for about 30 minutes to allow several mating to take place, although a single mating can be sufficient to get the doe pregnant.
- Always check both rabbits for signs of infection on the genitals. Infected ones must not be bred.
- Do not leave the doe with the buck overnight or for a few days since this can cause abortion or females can get pregnant twice because of the y-shaped nature of their womb which can make them carry two litters at once.
- Re-take the doe to the buck THREE days after mating to check if the previous mating was successful. If it was, then the doe will refuse to be mounted.
- Do not re-mate all does that will have been confirmed to be pregnant because they may abort.

Tips when mating rabbits:

Mate two does at the same time. An advantage of this is that if one of them refuse to suckle the kindles or dies you will always have a foster mother at hand

3.2.4 Re-mating

The time for re-mating does after kindling is merely the breeder's choice since does can

be mated as early as the day they kindle as long as they can stand to be mounted by the buck. At the very least, does can be mated for the first time 18 days after kindling. To achieve production of six kindlings, does should be re-mating four weeks after kindling. Economic viability can be achieved with production of an average of five kindlings per year. Table 3.2 shows the re-mating periods after kindling.

Re-mating time after kindling	Weaning age
2.5 months	5-6 weeks
10-20 days	4-5 weeks
0-1 days	4 weeks

Pregnancy

The duration of pregnancy is about 30 to 33 days. Pregnancy diagnosis can be carried out by palpating the doe 12 to 14 days after mating. The procedure is:

- Hold the rabbit vertically with its back against the handler's body with one hand supporting the chest,
- Feeling the womb for the presence of foetuses with the other hand. With experience, the rabbit producer will be able to do hi fairly easily.
- To ensure successful pregnancy, preparations should be done for kindling. The farmer must:
- Place a sanitised nest box in the maternity cage/hutch during 4th week of gestation.
- Provide good quality dry bedding material. This could be dry grass, shredded paper or wood shavings,
- If the doe makes her nest on the floor, a newspaper with its edges turned up against the walls of the hutch should be placed

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PIG producers need to be empowered through animal health extension services to:

- Be familiar with and watch out for incidence of common production diseases, their treatment and prevention, such as dosing, vaccination, and treatment of injured animals,
- Have in store basic drugs for treating animals such as eye and wound remedies, a bottle or two of standard antibiotics and many others.
- Have basic tools needed for handling and treating animals, for example, syringes and needles, dosing gun, surgical knife and blades, antiseptics like Dettol.
- Be familiar with and watchful of notifiable diseases like African Swine Fever

Bio-security measures aim to:

- Prevent the introduction of infectious diseases into the pig houses
- To prevent the spread of diseases from an infected property to other properties

This is achievable by putting in place a number of security measures, which include the following:

- Training of all personnel on the bio-security procedures;
- Controlling movement of people, equipment and vehicles entering the property to minimise the potential for property contamination through erection of boundary.
- Managing the introduction and movement of livestock in a way that minimises the risk of introducing or spreading infectious disease.
- Ensuring that all feed and water offered to pigs free from contaminants.
- Prevent and control animal diseases on farm by regularly monitoring livestock health.
- Managing proper disposal of dead animals to minimise the spread of disease
- Proper disinfection of pig houses before every new batch is placed in the pen. Buildings should be left empty after washing off disinfectant to permit drying for as long as is convenient before re-entry of stock.
- Limitation of movement of animals by quarantining all new animals brought to the farm. Under commercial conditions two to three weeks' quarantine would be acceptable. In the quarantine period close attention should be paid to the emergence of signs of diseases.
- The use of wheel bath and foot baths at entry points into the unit will help to keep infectious agents out of the unit. Footbaths can also be placed at entry points in the different sections of the unit, for example, farrowing, mating, gestation and nursery.

5.1 Biosecurity

Biosecurity refers to all the actions that should be taken to protect your pigs as well as yourself, your family and anybody else who works with the pigs, and the environment. All herds of any size should be protected from infections brought on to the property (refer to pig producer registration and inspection for AFRICAN SWINE FEVER-VETERINARY SERVICES). The basic requirements for an effective biosecurity system are:

- A pig proof fence around your piggery, with a lockable gate
- Keeping pigs permanently confined in pens
- Maintaining a good level of hygiene and disposal of all waste properly as described below
- Limiting access to the place where pigs are kept by unauthorised persons

NB: Only allow people who work with pigs and other extension and technical staff

Entry by vehicles to deliver feed or collect pigs should be kept to the minimum. Con-

struct a ramp at your fence that can be used for loading and unloading without bringing vehicles into the piggery. A disinfection programme should be designed and put strictly adhered to.

- People should disinfect their footwear thoroughly or change into clean boots supplied by the farmer, before entering the premises where the pigs are kept. Disinfection is usually by means of a footbath and scrubbing brush; the footbath must always be filled with fresh disinfectant at the strength recommended on the container.
- Vehicles that have transported pigs should be thoroughly washed and If necessary disinfected before being used for other pigs
- Never feed pigs with remains of human food that might contain meat or poultry.
- Make sure that new pigs come from a herd that you know is in good health; even so it is better to keep them separate from the other pigs and observe them for at least 14 days for any sign of illness
- Store feed in a secure, dry place that protects it from birds and rats, these animals not only spread diseases, but also waste your money by eating food that you bought for the pigs.
- Keeping feed dry is important to prevent mould from growing on it; mould can produce poisons called mycotoxins that cause disease in pigs.
- Observe the special regulations for control of particular disease as they apply to your area
- If you are farming in or close to the African swine fever control area, observe all the regulations to prevent contact between domestic pigs and warthogs or wild pigs
- The premises where pigs are kept should be surrounded by a double fence or solid wall
- Do not bring wild pigs or warthog carcasses in the area where pigs are kept and do not feed remains of these carcasses to pigs
- If you are farming in area where there is an outbreak of controlled disease (ASF, CSF, PRRS, FMD) observe all the regulations relating to movement and sale of animals, and watch the press or contact your animal health officer for updates on the situation.

5.2 Checking for diseases

Always check for diseases during feeding time for the pigs that is in the morning and in the afternoon. The stock person should however keep a close eye for any sign of diseases all the time. The signs of disease manifest

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Pig farming hygiene and biosecurity



The Zimbabwe National Water Authority (ZINWA) joins the rest of the nation in commemorating Unity Day. ZINWA greatly cherishes the peace and tranquillity that the country enjoys since the signing of the historic Unity Accord in 1987. Building on the power of unity, ZINWA stands ready and continues to work towards the creation of a water secure Zimbabwe.



1. Introduction

THE rainy season is finally here after starting late in December, 2023 and is expected to be normal to below normal. The season has also seen extreme temperatures from very hot to very cold. It is a well-known fact that poultry especially chickens, turkeys and guinea fowls do not like water puddles unlike ducks and geese. Seasonal change is one of the major factors affecting poultry production with the rainy weather affecting both poultry general health /well-being as well as production.

The rainy weather usually sees an increase in humidity and a reduction in temperatures, which therefore affects both the quality and quantity of feeding, while the speed of the wind and air circulation impacts on the outbreak of diseases. Some poultry diseases thrive under rainy weather or low temperatures. The onset of rains favours the breeding and spreading of causal organisms of the said diseases and parasites leading to many free range poultry farmers experiencing high morbidity and mortality rates during this period.

Many farmers record increasing cases of poultry diseases such as coccidiosis, fowl cholera, respiratory illnesses and fowl pox. Some of the diseases, which are common during the rainy weather will be briefly described below.

This article will guide you as a free range poultry farmer in your push to keep your free range poultry healthy during this rainy season.

2. Poultry and Rain

Poultry can be let out in the rain, as their feathers are kind of waterproof, except for the young birds or birds that are sick, as they become easily chilled. Free ranging or letting your birds out saves them from boredom, overcrowding and diseases that go along with wet fowl runs. It should be noted that it is not all poultry that like going out in the rain, but most birds will seek shelter and dry off before getting terribly wet.

3. Poultry and Sickness during the Rainy Season

Birds normally get sick after the rains because it causes wet and muddy conditions and adding high or low temperatures leading to the following problems:

- Rapid spread and multiplication of parasites such as gap worm and intestinal worms such as tape worm, round worm and hair worm; lice; fleas, tampans, mites and other external parasites as birds will be spending more time inside the fowl run, close together and not be dustbathing. In most cases the fowl run floors and the surroundings will be muddy and contaminated with droppings leading to birds exposed to a larger than normal parasite load.
- Ammonia build up and poor air circulation causing serious irritation of poultry's sensitive respiratory tract
- Breeding and growth of moulds and fungi leading to illness through contaminated feed.
- Breeding of illness-causing bacteria, and protozoa causing coccidiosis
- Poor sanitation in and round the fowl run as there is limited sun rays and heat which in destroys many different types of bacteria and parasite eggs in normal circumstances

Please note that poor fowl run designs lead to muddy wet patches or pools on the floor and after each rain. Generally poultry/ birds like to drink water from muddy pools of water even if you supply them with clean fresh water and these are likely to contain germs, bacteria, parasite eggs and other con-

How To Keep Your Free Range Poultry In Good Health During Rainy Season



Free range poultry exhibits disease resistance characters and they a very good pest control animals

taminated feeds. The birds can all be affected or infected from a little pool of dirty water leading to huge losses to the farmer.

A farmer needs to ensure that fowl runs are well positioned, well drained with enough light and ventilation plus cleanable even floors in order to avoid losses. Incase a farmer has a wet fowl run then try to fill the potholes with gravel and then put lots of bedding to reduce humidity and wetness in the fowl run.

4. Poultry Fowl Runs and Strong Smell during the rainy season

A wet and muddy fowl run can last for many days after the rain has stopped and has a combination of wet droppings, wet bedding, and all the mould, fungi and bacteria which grow and breed in the damp conditions. This is not healthy for poultry as indicated below:

- Poultry have sensitive respiratory tracts so the gases such as ammonia produced by these fermenting bedding/litter leads to irritation and respiratory diseases
- Moulds and fungi tend to grow on wet bedding/litter, which, if consumed or inhaled, leads to illness or death of the birds.
- Wet and dirty bedding/litter mostly leads to bumble foot.

Please note that the smell of the bedding/ litter in the fowl run means that it is full of droppings, bacteria and parasites.

5. Common Poultry Diseases during rainy season

Fowl Pox

Fowl pox is considered a highly contagious disease that affects poultry birds of all ages. The disease is caused by poxvirus transmitted by mostly mosquitoes and other blood-sucking insects.

Fowl pox is mainly prevalent during the rainy season because mosquitoes being the vector breed well in the season due to the plenty of stagnant water. Poor roofing of fowl runs fail to shield the poultry from rains as water drips in leading to wet bedding which then prompts increased fly breeding in the fowl run.

Recognising Fowl Pox

Fowl pox normal affects chickens and turkeys more than other birds. The birds develop round lesions with scabby centres on their skin set on their wattle, face, comb, and some occasionally located on the legs and also affecting the bird's mouth and windpipe linings. Death can occur due to suffocation as the lesions in the throat can develop to the extent of blocking it. Temporary or permanent blindness can be caused by lesions on the bird's face which extend to the eyes of the affected bird.

Fowl pox Prevention

As indicated earlier, fowl pox is transmitted by mosquitoes hence the need to reduce the mosquitoes in and around the fowl runs and the environment around the farm by dealing with the mosquito breeding spots. The most important and effective prevention method against fowl pox is timely vaccination of birds

such as chicken and turkeys before the onset of the rains.

Fowl Cholera

Bacterial disease caused by bacterium *Pasteurella multocida* is called Fowl Cholera which affects poultry birds from the age of 6 weeks and above. The disease is highly contagious and high mortality is in acute cases. Wet bedding in fowl runs works as a habitat of many microorganisms which then spreads the causal bacteria during the rainy season.

Recognising Fowl Cholera

Birds that appear healthy can die suddenly in severe cases of infection, while in chronic cases the affected poultry birds have the following signs and symptoms:

- Loss of appetite
 - Sagged wings and tail feathers
 - Yellow, green or grey diarrhoea droppings
 - Difficulty in breathing
 - Twisted neck (torticollis)
 - Ruffled feathers
 - Swollen leg joints, sinuses, wattle and foot pad
 - Watery Discharge from the nostrils or beak
- Please Note that the above signs might be confused with those of fowl typhoid.*

Fowl Cholera Prevention and Control in Poultry

The best way of preventing birds from Fowl Cholera is by administering timely fowl cholera vaccine. The other way of preventing

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Introduction

ALTHOUGH the importance of goats and the nutritional value of their products is well recognised, this has not been accompanied by increased demand or consumption beyond the goat-owning households. This raises a question of how goats and goat products are popularised and marketed in Zimbabwe, because there is need to promote the diverse range of goat products including formal marketing of live animals. The main potentially marketable products from goats include:

- Milk and milk derivatives, for example, yoghurt, ghee, skimmed milk, butter, cheese
- Meat and carcass products
- Skins
- Fibre

In Zimbabwe, the sale of live animals for meat is the most important marketing avenue and even for this, markets are largely informal. Individual farmers or farmer groups, therefore have to find their own markets and marketing strategies for goat products produced in surplus quantities to household requirements. The need to identify and target the peak market demand for the animals and products, such as festive seasons like Christmas/New Year and Easter holidays. As regards processed products, farmers should:

- think out carefully on the costs of any processing equipment and the labour required in relation to the market price.
- be cognisant of the diseases which can be transmitted from goats to humans through the processed products like milk and meat, e.g. brucellosis, tuberculosis, pneumonia.
- be aware of the need to handle products during processing in a manner that minimizes the risk of disease transmission to their own families and to other consumers.

Milk and milk products

It is important to note that milk is an ideal medium for the growth of bacteria; therefore, care must be taken in its handling. Contamination can be avoided by ensuring that:

- The milker's hands are clean.
- Teats are cleaned with clean water and soap.
- Milk is from mastitis free animals.
- Milk is free of drug residues in animals that are/ were undergoing treatment (milk withholding periods are inscribed on most drug leaflets).
- Milk is kept and stored in clean containers at cool temperature. Stainless metallic containers are the ideal.

Yoghurt

Yoghurt is the product of the process of souring milk using certain selected bacteria. Raw milk is heated nearly to boiling point for three minutes and cooled to about 45° C when a small quantity of a starter, such as previously made yoghurt, is stirred into the milk. The milk should then be left undisturbed to sour at a temperature between 30 and 45 degrees Celsius. When incubated at this temperature, it takes 15-24 hours before its ready for consumption. Various flavours can also be added.

Butter

Butter is a very valuable commodity in many societies. Goat's milk, from tropical breeds, has a high fat content, making it very suitable for butter making. In order to produce one kilogramme of butter, 25 litres of milk must be churned. In our farming systems, it is rare to get 25 litres of milk from one farmer. A group of goat farmers might consider getting together and contributing milk to a butter-making enterprise. Details for processing of butter can be read from relevant books.

Cheese

Few countries in the tropics traditionally make cheese, and even fewer make cheese from goat's milk, although the fat-content in goat's milk is adequate for cheese making. In situations where cheese has never been made and is not

Processing and marketing of goats and their products



A herd of Boer goats

traditionally consumed, such as in Zimbabwe, there must be very good reasons for introducing the practice. These include:

- Inadequate opportunity to market fresh goat's milk.
 - Surplus production.
 - Motivation to earn from cheese making.
 - Developing the cheese market potential
- Greater skills, more equipment, and a greater volume of milk are needed to make hard cheese. About 75 litres of milk are needed to produce one kilogramme of fresh cheese. Over 10 litres are needed to make one kilogramme of hard cheese. Farmers can always attempt cheese making as long as they get a fair price for their product.

Meat and carcass products

Goat meat is desired for its palatability and nutritional quality. Most goats in Zimbabwe are either slaughtered for home consumption or they are marketed live for subsequent slaughter. In Zimbabwe, like in most other developing countries, virtually every part of the carcass is consumed or used in some way. Prices differ depending on the geographical region, proximity to cities and towns,

Preservation of meat

Goats that are slaughtered are consumed almost immediately within the household. Their small size makes them ideal to slaughter for a family, compared with slaughtering cattle. There are, however, occasions when the carcass cannot be consumed in short period and it would be necessary to preserve and store meat in some way. In the absence of refrigeration in many rural households, the following preservation methods need to be considered:

- Salting/curing
- Hot smoking
- Air drying

Skins

There are many diseases of goats that will damage the skin and affect its quality and price.

ods of skin curing:

- Air-drying: The wet skin can either be pegged out on the ground or tied to a frame and dried upright. It is important to avoid any damage to the skin and to try not to spoil the edges through clumsy pegging or tying. Under dry weather conditions, skins can be cured in 1-2 days.
- Salt Curing: The fresh skin is cleaned of any blood or dirt, and washed with clean water. It should be laid out with the inside facing upwards. Salt equivalent to 40 percent of the weight of the skin is sprinkled on to it until the skin is covered with in an even salt layer. The salt will serve both to reduce the moisture content of the skin and to prevent growth of bacteria. The skin can be folded with the salted side inside and kept in this way for long periods before tanning.

Goat hair

Goat hair can be clipped, processed and used for various purposes. In Zimbabwe, commercially goat fibres are produced from mohair of Angora goats.

Marketing goats and goat products

Any goat product for sale whether it is milk, skins or live animals should earn the farmer a good price. There are few private sector marketing organizations and no state-run marketing organizations. Consequently, farmers tend to accept any price offered to them without considering the costs of production. Farmers must be made aware of the advantages of collective or cooperate marketing and what they stand to lose if they market their goats individually. Therefore, Farmers need to always ensure that they get fair prices for their products and should be encouraged to lobby the relevant institutions (e.g. Government, farmers' unions) for the development of formal marketing channels for goats and goat products. — FAO



The Board, Management and Staff of Traffic Safety Council of Zimbabwe (TSCZ) join **His Excellency, The President of the Republic of Zimbabwe, Cde. Dr. E.D. Mnangagwa** and the entire Nation of Zimbabwe in commemorating **Unity Day**.

We honour and celebrate Unity Day as it reminds us that the unity, peace, and tranquility we enjoy today are products of the selfless sacrifices and commitment to fostering peaceful co-existence and to see an end to all forms of violence.

We interpret Cde. Mnangagwa's National Vision, which among others, prioritises the reduction of road traffic crashes and fatalities by 50% by 2030, as a call to carry forward the revolution towards national economic emancipation. As Traffic Safety Council of Zimbabwe, we commit to playing our part in the fulfilment of the National Vision and Aspirations.

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SAFETY FIRST!
There is no second chance.

DECADE OF ACTION FOR
ROAD SAFETY
2021 - 2030

Safety First
Road to safe and sound future



The couple sitting in their lounge away from the field hassle



The Rezars in their maize field



A neighbour, Patience Musinake (right) helps Mrs Rezar ferry a bag of vegetables



The couple inspects onions in a shed

The little Eden the Rezars created at Arcadia Farm

Obert Chifamba

NOONE can begrudge Canadian author Robertson Davies when he posited that “every man makes his own summer and that a season has no character of its own, unless one is a farmer with a professional concern for the weather.”

His wise words resonate well with the exploits of one Mr Fix Rezar (56) and his wife, Sherekete Chidhobha (54) of Plot 6 at Arcadia Farm in Mhangura. While the just-ended dry spell had the entire nation spellbound and searching for answers as to when it would end and allow farmers to start planting, the couple was using buckets to irrigate their Pfumvudza plot of a knee-high maize crop that is currently flourishing as if there was never a prolonged dry spell since its germination.

The fifth child in a family of 12, Mr Rezar was born at Chimufombo Village in the Guruve communal lands where the family eked a living from farming. His father worked in a grinding mill while the mother was a full-time house wife. Fast forward to 1990, Mr Rezar got married to his sweetheart and wife — Sherekete who was born into a family of 11 in the Chitomborwizi area just outside Chinhoi.

Chitomborwizi has been famed for its farming culture for decades and her family was no exception with the farmer getting the ‘Master Farmer’ award in many instances.

Farming has been in her DNA since childhood and what she is doing now with her husband at their six-hectare plot is enough to give one an accurate summation of her farming

background.

The couple got the six-hectare piece of land in 2003, thanks to the Government’s land reform programme that sought to address land imbalances that had seen millions of Zimbabweans going landless for decades while the minority white settler community had the prime land to itself.

“We had been staying in Trelawney, just outside the small town of Banket where I worked as a salesman for a hardware shop. I had always wanted to be a full-time and serious farmer but was failing to get land to do that so when the land reform programme came, I was happy to apply for a piece of land, which I duly got here,” said the soft-spoken Mr Rezar when this news crew visited his plot recently.

Mr Rezar narrated how he started growing maize at the plot, as well as build his own cattle herd that now stands at 23 with five goats and innumerable free range chickens that he is also keeping. The couple is planning to add fish to their list of farm animals and plans to construct a pond are already at an advanced stage, said Mr Rezar.

“For now our focus is on making sure we give our crops all the attention they deserve so that they give us good yields. We will have maize on six hectares, groundnuts on one hectare and soya beans on another to make them eight in total. We will rent the other two since our plot is sitting on just six. We hope the Government can help us in our quest to get a bigger piece of land to enable us to contribute more effectively to the fight against food insecurity than we are

currently doing,” chipped in Mrs Rezar.

She added that their most memorable moments as farmers came in 2021 when they notched a whopping 61 tonnes of maize up from a yearly average fluctuating between 35 and 45 a season. Mrs Rezar said they were managing to score good yields thanks to diligent planning, proper weed and pest management and the full utilisation of the borehole they have drilled on their plot.

“We have managed to save this current maize crop from the dry spell that marked the better part of the season through physically watering the crop after our tank developed problems and so we could not irrigate. We have a solar-powered irrigation system that we secured using proceeds from our activities here. As you can see we have an old tractor that we are targeting to pair with a new one soon. We have built this homestead and send our two children to school using earnings from the farm,” she said.

The couple’s farming success is a clear demonstration of the need to plan and work together supporting each other constructively in whatever they would have come up with. Their journey also had its fair share of challenges, for instance, the 2012 drought that saw them reaping a ‘paltry’ 12 tonnes of maize in their words. The other problem they all agree is frustrating them are the rental charges of US\$100 per hectare they are having to contend with each time they want to rent land.

Away from the frustrating moments, the affable couple attributes its trailblazing performance from 2003 to the present to just planning

their activities together, working with banks, applying the correct fertiliser and animal manure requirements to crops, knowing what they want to grow and above all – planting on time.

“Nothing beats planting on time. You do not want to miss planting deadlines unless there is a very serious problem. There is not success in randomly planned activities. We love the planning that comes with the Pfumvudza/Intwasa programme. It is rewarding us handsomely here. We were even proud hosts to a team from the First Lady’s office in February last year when we had a field day here. It was an unforgettable moment for us when they commended our work ethic here,” commented Mrs Rezar.

The couple does not end with conventional crops only, as it also produces a variety of vegetables that they sell to the community and neighbouring Lions Den centre. They are also planning to buy a bigger truck to complement the one they have, which they see as not big enough to ferry their vegetable produce to markets safely.

“If all goes well, we will buy the truck this year. We are just praying that the rainfall situation improves to enable all our crops to grow to maturity so that their quality is not compromised,” she added.

The Rezars have one permanent employee but engage casual labour each time they reach peak periods for weed management and harvesting. They are a couple that believes it does not take two to tango but to farm productively and successfully.

Record keeping and financial management

RECORD keeping is necessary for the growth of any business enterprise. Bee keeping is not an exception. Good records allow the beekeeper to follow general progress of the operations. Generally, there are two types of records needed in bee keeping and these are colony and operational records.

8.1 Importance of records

It is a good idea to keep records during each hive inspection so that you can follow the progress of each colony and monitor their condition. But bear in mind that each inspection should have some purpose and routine examinations should be planned.

Records can be kept so that you know what was done last time and what to do next time and what equipment you might need.

Keeping records allows us to identify where we have made mistakes in colony handling.

Management records are for the beekeeper's individual benefit. Some people like to keep records of all their financial outgoings. From these they can work out when they might recoup their costs from sales and to work out how much profit they expect to get.

Most of us can remember what is going on if we have one colony but when they become many, it becomes more difficult, therefore recording becomes essential.

All the data collected is useful when the number of colonies has grown considerably and you want to start selecting the best ones.

Records help in the selection of good queens for breeding purposes.

Types of records

Colony Records

- Date/time of last inspection, forage and weather conditions.
- Date of occupation/colonisation
- Age of queen
- Date of last harvest
- Honey yield per hive.
- Colony strength and growth rate (number of combs containing brood)
- Timely manipulation (swarm prevention, feeding)
- Amount of honey/stores in hive
- Characteristics of hive (defensive, calm, productive, poor)
- Swarming record — how often, when and why.



- Pests and diseases.
- Hives name and number

Type of hive

Operational Records

- Visits to the apiary site
- Cash flow-how much money spent or earned.
- Purchases
- Labour
- Transport costs
- Servicing of equipment
- Other expenses
- Income

How to keep records

There are so many aspects of the enterprise that could be recorded, but not all the records are useful. The bee keeper should decide what records he wants to keep. To help decide the kind of records, one should ask themselves the type of information that they need to improve their

operations. This information could be recorded in tabular format in a hard covered book that can be kept securely. The individual hives and colonies should be identifiable, for example, by numbering them. Recording should be done immediately after individual operations such as after inspection, harvesting and many others.

Financial management of a beekeeping business

For beekeeping to be sustainable, the revenue must exceed the expenses put into running the enterprise. Revenue refers to money collected from selling products. The saleable products of beekeeping are honey, wax jelly, propolis and pollen. Expenses refer to the amount of money

the bee enterprise requires to operate. Hives need to be constructed or hired, equipment and packaging materials need to be bought, labour need to be hired Rent must be paid.

Then there is health, storage, electricity, etc. The list can be long: the key to making money is to know exactly what your expenses are and how to keep them at a minimum without compromising production, and to know as best you can what your revenue is now and what your revenue will be in the future. The financial framework is presented in the Table 8.1 below.

Table 8.1. Budgeting framework for a bee-keeping business

Budget Item	Amount (USD)
REVENUE	
Honey	
Wholesale	
Farm gate	
Comb	
Wax	
Pollen	
Propolis	
Sale of bee colonies	
TOTAL REVENUE (TR)	
EXPENSES	
Feed (sugar and many more)	
Queen purchases	
Hive treatment	
Hive repairs	
Labour	
Interest on loans	
Utilities	
Taxes	
Depreciation	
Overheads	
TOTAL EXPENSES (TE)	
NET INCOME (TR-TE)	
Adapted from FAO	



Ministry of Veterans of the Liberation Struggle Affairs



The Ministry of Veterans of the Liberation Struggle Affairs joins the nation in the 36th National Unity Day commemorations. As Veterans of the Liberation Struggle, Unity Day commemorations epitomise the ultimate sacrifices made by our fore bearers in the various phases of the struggle for Independence and freedom. May the shared vision and values of the protracted liberation struggle continue to guide and inspire the nation as we march towards Vision 2030.

Premised on national unity, Zimbabwe has made milestone achievements in building a peaceful environment in the region, fertile for regional security, integration and attainment of development goals. May we remain united, peaceful and patriotic citizens working for the betterment of our country in the various sectors of the economy.

Happy Unity Day Zimbabwe

Desire Tavengwa

HYDROPONICS is a modern and innovative method of growing plants without the use of soil. The term comes from the Greek words “hudor” for water and “ponos” for work, so in translation, it essentially means “water-working.” This technique relies on providing plants with all the necessary nutrients through a nutrient-rich water solution, which is delivered directly to the roots. Hydroponics offers several advantages over traditional soil-based agriculture, including increased crop productivity, conservation of water resources, and the ability to grow plants in areas with limited arable land.

One of the significant benefits of hydroponics is its ability to produce higher yields compared to traditional farming methods. By allowing plants to receive a precisely controlled balance of nutrients, water, and oxygen, hydroponics creates optimal growing conditions, promoting accelerated plant growth and development. The absence of soil-related constraints, such as nutrient deficiencies and inconsistent watering, allows plants to focus more energy on above-ground growth and fruiting, resulting in increased yields.

Hydroponics offers several advantages over traditional soil-based agriculture. Some of the key advantages include:

High Yield

Hydroponics offers a higher yield of calories per growing area. This is one of the reasons the UN's Food and Agriculture Organisation (FAO) is helping to implement the use of hydroponics farming in areas of food shortages to help produce more crops and feed more people. Plus, plants grown hydroponically can grow at least 20 percent faster than their soil-bound counterparts.

Control

Unlike growing in soil, where there are so many different influences (pH, light, air temperature, microorganisms, tilth, and so on), hydroponic growing can be almost completely controlled. This is because it effectively removes the plant from a natural environment and instead creates what is, at least in theory, an optimised ‘ecosystem’ designed to grow in the absence of soil. The plants are fed a nutrient solution that can come in many forms, but usually, it's water with a mix of fertilisers and minerals or trace elements that plants require for food.

Less Water

At a large scale, hydroponics consumes less water — up to 90 percent less than traditional field crop watering methods — because most hydroponics use recirculation techniques to minimise waste. In conventional farming, water is lost due to evaporation, inefficient irrigation, and soil erosion among many other factors. Because hydroponics is removed from the natural water cycle, it can cut down on losses in these areas.

Regional Diversity

Hydroponics allows farmers to grow food pretty much anywhere. For instance, hydroponic systems can be set up in homes, greenhouses, or any indoor space. Even deserts climates, like in Egypt and the Middle East, can support hydroponic agriculture at a scale capable of addressing local food needs. Scientists are even attempting to utilise the technology on the International Space Station — in a facility called “veggie” — to grow food for astronauts so that they can stay in space for longer missions. In fact, after a lot of testing, astronauts were able to eat space-grown leafy greens in 2015.

Continuous Production

Hydroponic technology offers continuous production as well. Unlike conventional agriculture which primarily utilises large outdoor crop fields, hydroponics growers don't have to worry

Unpacking the concept of hydroponics



about the changing seasons. Crops can be grown and harvested year-round, increasing supply and reducing the need for preserving food.

Fewer Toxins

While conventional agriculture relies heavily on chemical herbicides and pesticides, hydroponic systems do not require much if any of these toxic applications. Because there's literally no soil for pathogens to live in, few pests or diseases can survive in a properly-maintained hydroponic setup. And although chemicals are sometimes still a part of hydroponic growing, most at-home systems can remain free of pesticides and other harmful agro-chemicals.

While hydroponics offers many advantages, there are also some potential disadvantages to consider. Initial setup cost: Setting up a hydroponic system can be more expensive compared to traditional soil-based farming methods. The cost of infrastructure, equipment, lighting systems, nutrient solutions, and monitoring systems can be significant. This initial investment may deter some growers, especially those with limited resources or smaller-scale operations.

Technical knowledge and maintenance: Hydroponics requires a good understanding of plant nutrition, pH balancing, and nutrient management. It involves closely monitoring and adjusting the nutrient solution's composition, pH levels, and electrical conductivity. Maintaining the system's functionality, including pumps, filters, and irrigation, also requires regular attention and technical expertise. Inexperienced growers may find the learning curve challenging and may face difficulties troubleshooting system issues.

Environmental Impact

Hydroponic growing can save water, but it can also require significant infrastructure since it's typically done in an indoor setting. And the vast amount of tubing, as well as containers for the growth media, typically require large amounts of plastic. Over time there may be less resource-intensive methods developed, but for now, this is a big drawback. And some hydroponic systems depend on grow lights that use significantly more energy than outdoor soil-based agriculture. Some also use chemical fertilisers that are non-renewable, too. And while hydroponics can save a lot of water when implemented on a large scale with recirculation techniques, smaller-scale home gardeners may not experience these water savings.

In addition, hydroponics represents something of a missed opportunity to practice one

of the most hopeful opportunities that holistic regenerative agriculture offers, which is to sequester carbon and replenish soil.

System Vulnerability

Hydroponic systems can get highly sophisticated. And if one of the pieces — like a pump, string, or timer — should fail or be installed incorrectly, the entire crop yield is at risk. Like all scalable systems, hydroponics can sacrifice resiliency for efficiency.

Economic Control

Large-scale hydroponic farms require a significant infrastructural investment that comes with a hefty price tag that can run into millions. This can make it harder to access unless growers have deep pockets or are backed by investors. If scaled up, is it possible that it could wind up marginalising small-scale farmers and putting our agricultural systems more in the hands of large companies and venture capitalists?

Nutrition

The nutritional value of hydroponically grown foods can vary, although vitamin levels tend to be similar whether a vegetable is grown hydroponically or in soil. Overall, hydroponic plants can be just as nutrient-dense as conventionally soil-grown plants. But not all hydroponically grown plants have the same mineral content, which depends mainly on the nutrient solution used. Furthermore, more research needs to be done to fully understand whether or not hydroponic fruits and vegetables can produce the same secondary plants metabolites as conventional produce — which can affect everything from taste to medicinal potency. This lack of research is fueling concern that plants grown in water rather than soil may be missing some unknown plant nutrient. This could lead, over time, to unforeseen micronutrient deficiencies in food grown this way.

There are several different methods of hydroponics, each offering unique advantages and catering to specific growing environments and crop types. Here are some commonly used methods:

Wick System

This system, named for its functional resemblance to a candle wick, is the simplest setup. Nutrients are pumped from a water reservoir, via a string, up to the growing medium that holds the plants. This approach is a popular choice for home gardeners who want to give hydroponics

a try. But it isn't great for larger plants because a string isn't able to provide enough water for them. And an incorrect setup or material use can be fatal to the plants.

Deep Water Culture System

Also called the Kratky Method, after its creator, the University of Hawai'i horticulturist B. A. Kratky (who, and I am not making this up, received a degree in “Weed Science” from Purdue University in 1971), this system works by placing plants in pots on top of a floating holder so that the roots are in the growing medium. It recirculates water, reducing waste, and is inexpensive and very low maintenance. However, this method isn't a good fit for large plants either, or plants that have long growing periods because they have to be lightweight enough to be well supported by the floating raft.

Nutrient Film Technique (NFT) System

This system is used in many vertical farms, which are essentially plant skyscrapers. Some can house thousands of square feet of hydroponic growing systems. NFT is also the most common type to use in home, lab, and commercial settings. It works by allowing a continuous nutrient flow to the plant and back to the reservoir using a slightly downward-facing tube. This design has two advantages: it doesn't require a timer because the pump runs 24/7, which is one less thing to set up (but could be problematic in a power outage). And it does away with the need for a growing medium. But it's a little higher maintenance as growers have to watch that the plant roots don't grow in a way that clogs the system. And they have to periodically make sure the pump is working properly, so the plants are getting adequate nutrients.

4. Ebb and Flow System

This method uses a pump on a timer to regulate nutrients going from the reservoir to the growing tray. The nutrients drain back into the reservoir after they have thoroughly encompassed the plant roots. This system can be customised to fit the grower's needs, and efficiently uses water and energy, but requires a significant amount of growing medium.

5. Drip System

This system uses a timer that controls when the nutrient solution is transferred through a group of drip lines to provide tiny drops of water for the plants. It's relatively inexpensive and gives more control over the schedule. But it's probably overkill for a small garden at home and can waste a lot of water.

6. Aeroponics

Aeroponics seems to be one of the most complex hydroponics options. Plants are suspended in the air, requiring no growing medium. And a timer controls a spray system to frequently deliver nutrients to the roots. As such, the roots are exposed to more oxygen using this system.

7. Aquaponics

In aquaponics, fish — and sometimes other aquatic animals like snails, prawns, and crayfish — and crops are combined into one symbiotic. Waste products that can be harmful to fish in high concentrations are filtered out of the system by the plants, which use them for their own nutrition. While fish farming is often environmentally disastrous, not all fish farms are the same. Aquaponic farms are unique because they combine fish farming with hydroponics, and the two work together to create what at least has the potential to be a more sustainable system in which each element can benefit the whole.

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Bolton Kakava

TROPICAL Race 4 (TR4) strain of *Fusarium oxysporum* f.sp. *cubense* is one of the main threats facing producers and workers in the banana industry. The pathogen causes Fusarium wilt in banana and is also known as "Panama disease". TR4 has infested banana plantations in Taiwan, Mozambique, Indonesia, Malaysia, Jordan, Oman, Australia, Vietnam, Laos, China, Colombia, Pakistan, Peru, Lebanon, Israel, UK, Philippines, Venezuela, India and Myanmar. The disease wiped out the Gros Michel banana industry in Central America and the Caribbean, in the mid-twentieth century. The effects of *Fusarium oxysporum* f. sp. *cubense* Race 1 were overcome by a shift to resistant Cavendish cultivars, which are currently the source of 99 percent of banana exports. The new strain of *Fusarium oxysporum* f.sp. *cubense* called Tropical Race 4 has overcome resistance in Cavendish clones and caused epidemics in the tropics. It is a growing concern for the export industry and producers as it colonises, infects and destroys Cavendish banana plants and many other varieties. Once present, the disease cannot be controlled by chemical or cultural management practices.

Available methods for disease containment are not fully efficient on TR4; and alternative options TR4 tolerant varieties- are still at the evaluation stage. The social consequences of Fusarium wilt can be severe: bananas are an important source of food, income, employment, and government revenues in 135 tropical and subtropical countries. Planting material, water, soil particles, tools, footwear and machinery can efficiently disseminate the pathogen. The fungus can survive in soil for more than 20 years. The pathogen can survive as chlamydospores in absence of a host. Proximity to banana roots induces chlamydospore germination. Banana infection occurs as response to primary and secondary root exudates. The disease has a long latent period, and there is no symptomatic differences among races. Early detection of symptoms in the field and fast laboratory diagnostic are essential for eradication or containment of outbreak.

The main pathways for transmission of TR4 are infected living or dead host plants, soil from infected fields, carried out of the field by people machinery and animals or mechanically as contaminants on tools. Soil movement with transport and irrigation water, drainage, or other water fluvial could spread secondary inoculum. Highest risk of dispersal is via propagation material that has historically been the main dispersal mechanism. Introduction of TR4 in any country could result in substitution of most popular banana genotypes by others of lower acceptance. It will also lead to introduction of new banana production methods requiring different and costlier cropping practices.

Risk management is carried out via application of firstly, phytosanitary measures to prevent the entry of TR4 into the country and eradication-confinement or suppression-contention measures in case of an incursion. The first step is an absolute prohibition of the entry of plant or plant parts from sites where TR4 is present. At entry points, TR4 presence can be detected by carrying out inspection of plants with wilt and vessel-necrosis symptoms.

The plants should be seized and sent to a diagnostic laboratory. Once the presence of any organism of the TR4 complex is confirmed, the material should be confiscated and immediately destroyed. Molecular based methods such as

Tropical Race 4, a threat to global banana production



Figure 1: Geographical Distribution: Races 1 and 2 of *Fusarium oxysporum* f.sp. *cubense* are widespread. TR4 is present in Mozambique — no official reports on the impact.

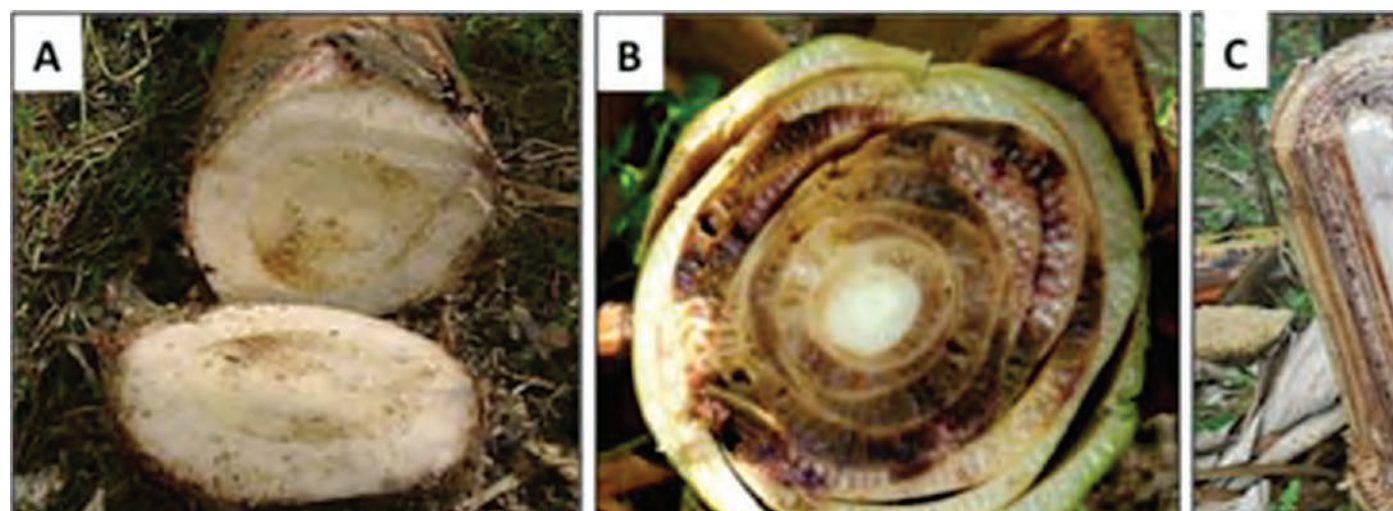


Figure 2: Symptoms — rhizome and pseudostem: A. rhizome showing tissue necrosis. B. pseudostem showing advanced necrosis of vascular tissues. C. pseudostem showing necrosis of the vascular strands.



Figure 3: Symptoms — above ground parts: A) Yellow leaf syndrome B) Pseudostem splitting. C. green leaf syndrome. D. petiole collapse

Polymerase Chain Reaction (PCR), Amplified Fragment Length Polymorphism (AFLP), and Sequencing of ITS region are used to diagnose TR4 in infected plants.

The disease is prevented in several ways, which involve national legislation and biosecurity measures. TR4 should be included in the national list of quarantine pests and of obligatory declaration. Prohibition in importation of Musa plants, plantlet, or other hosts from countries where TR4 is present. Imports of Musa germplasm or of plants for propagation should use the route of intermediate quarantine stations. Those materials should be adequately indexed and identified as free of TR4.

The capacity-building and sensitisation campaigns among personnel that in the line of duty,

visit fields in countries where TR4 is present. This should include measures to take after field visits to prevent transfer of soil or plant parts in clothes, shoes, and/or work equipment.

The disease is managed through phytosanitary based quarantine measures and limitation of area access, use of soil fumigants, sanitation of infected and neighbouring plants, use of soil fumigants and replanting. The production of a certified healthy planting material program accessible to growers. Crop rotation with Fusarium wilt non-host plants has been used to reduce *Fusarium oxysporum* f. sp. *cubense* population in the soil.

Plant nutrition is used to minimise the development of the disease through application of trace minerals. High phosphorus content in soil

reduces Fusarium wilt incidence. High calcium content reduces chlamydospores germination. A reduction in iron reduces chlamydospore germination. Biological management is being employed through application of plant growth promoting microorganisms (PGPMs) such as *Trichoderma*, *Bacillus* among others.

The GLOBALG.A.P. TR4 Biosecurity Standard outlines a risk mitigation plan for minimising the spread of the TR4 fungus, and is available to producers who do not have another form of GLOBALG.A.P. certification. The TR4 Biosecurity Standard is based on the content of the existing TR4 Biosecurity Add-on for Bananas—the result of a global action plan presented by the GLOBALG.A.P. Secretariat and the World Banana Forum (WBF) in 2018.

Managing rabbits' reproductive environment

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underneath the nest and litter moved into proper box just after birth.

Kindling

The litter size ranges from 4 to 12 bunnies, with an average of seven bunnies. A litter size of 8 to 12 is considered commercially viable. When the doe is ready to kindle, she usually plucks hair from her abdomen to line the nest. During kindling, cover the top of the nest box to avoid destructions. Young rabbits are deaf

and blind and should be handled with care. Soon after kindling.

- Foster some of the bunnies to even out the numbers if several does kindle at the same time.
- Rub Vicks and foster doe's urine or faeces on handler's hands or on doe's nose to prevent rejection of bunnies by the foster doe.
- Allow the fostered bunnies to get the first milk (colostrum) from their mother before being fostered.
- If the floor of the maternity cage is of wire or has big holes which make it difficult for the kindles to put their feet down, place a piece of plywood or something similar in a corner so they can rest easily.
- Cull the weak young rabbits within 24 hours.
- Remove the nest box three weeks after kindling.

Cannibalism can be caused by unrest, lack of drinking water and lack of minerals or it can simply be a bad characteristic of a doe, which must be culled.

3.5 Fostering

This is removal of bunnies from a doe with a big litter size to one with a smaller one. It should be done on the first day and only for does that have kindled on the same day.

3.6 management of the young

The young are totally dependent on the mother's milk for the first 10 days of life. The doe can only suckle her young once or twice a day and might not be in the nest that often. After kindling:

- Do not disturb the doe and its young except when providing food, water and cleaning the hutch
- Check the nest box to remove any soiled bedding since dirty environments can make the young susceptible to infections
- Check to ensure that bunnies are suckling and not showing any signs of sickness
- Bunnies showing signs of ill health should be isolated from the rest of the litter and treated
- Ensure that doe and litter are well protected from extreme weather conditions and stress from predators

Development stages of young rabbits:

- Day 7: body weight is doubled and fur begins to grow
- Day 10: eyes begin to open
- Day 12: ears open
- Day 18: litter leaves nest and begins to eat solid food
- Day 21: peak milk production although litter is beginning to consume solid feed
- Day 28: milk production declines and litter is fully on solids
- Day 60: fully weaned and independent
- Day 150 sexual maturity

3.7 Weaning



Bunnies should be weaned at 7 to 8 weeks of age especially if they are on a low plane of nutrition. For production purposes weaning can be done as early as four weeks to ensure a higher reproductive rate.

When weaning, take the doe to another hutch and leave the young in their hutch. This is done to prevent stress of change of environment as young rabbits are prone to infections at this time.

Ensure a clean environment at all times at this stage for both the doe and bunnies since dirty environment can predispose the doe to mastitis. Avoid giving the doe concentrate feed two days after weaning to aid in drying-off if the doe was initially being fed on concentrates.

Adapted from Food and Agriculture Organisation (FAO)

How To Keep Your Free Range Poultry In Good Health During Rainy Season

♦ To Page 8

fowl cholera is by maintaining strict hygiene and sanitation in fowl runs and surroundings, this includes practicing high level of biosecurity and preventing rodents, wild birds, and other animals getting into the fowl runs. Lastly should an outbreak occur, fowl cholera can be treated using sulfa based drugs, tetracycline and erythromycin.

Bacillary White Diarrhoea

The disease is caused by bacterium *Salmonellosis*, *Pullorum* and *Escherichia coli* which affects birds of different ages. The bacteria affect the digestive system of the infected birds. This bacteria is widespread on fowl runs and farms that have poor sanitation where wet bedding is left in the run for long periods.

Recognising *Salmonellosis*, *Escherichia coli*, *Pullorum* in Poultry

Below are signs and symptoms of the disease

- Depression and emaciation
- Poor appetite
- White pasty diarrhoea
- Severe diarrhoea
- Crowding together and
- Difficulty in breathing

Prevention of the disease

Salmonellosis, *E. coli* and *Pullorum* diseases can be prevented by practicing high-level fowl run and farm hygiene and sanitation supported with strict biosecurity measures. Importantly farmers should avoid feeding birds with bacte-

ria contaminated feeds.

Coccidiosis

Coccidiosis in poultry is caused by protozoan *Eimeria* sp and it infects rapidly within 7 days various sites in the intestines thereby causing extensive damage to the intestinal mucosa.

It should be noted that sporulation of the coccidian oocyst and thereafter, the outbreak of coccidiosis favours wet bedding and high temperatures within the fowl runs.

Recognising Coccidiosis in Poultry

Birds affected by the diseases have bloody faeces, ruffled feathers, anaemia, and somnolence. Other signs and symptoms include the following:

- Appetite loss leading to depressed feed and water consumption
- decreased growth rate
- Weight loss
- high percentage of visibly sick birds,
- Severe diarrhoea,
- High mortality
- decreased egg production, and
- Increased mortality may accompany outbreaks.

Prevention of Coccidiosis in Poultry

The most important thing in prevention is to practice basic hygiene in poultry fowl runs and ensuring that they are spotlessly clean and dry. Other preventive measures to be undertaken are as follows:

- Keep poultry feeding areas clean and dry by

always putting fresh and dry bedding

- Ensure poultry drinking water is clean and fresh.
- Avoid overcrowding of birds in the fowl run as it does spread the disease faster.
- Anticoccidial medication can be given to chicks at about 12 days of age.
- In order to prevent a horizontal transfer of infection there is need to keep new batch of birds under quarantine for at least two weeks so as to ensure protection of the existing stock, for the protection of the current stock.

6. Keeping free range poultry healthy in rainy season

During the rainy season, rains can pour down heavily continuously for days and free range poultry farmers should take necessary steps to ensure that the birds remain healthy.

To avoid the illness and diseases in the fowl runs a farmer can do the following:

1. Ensure the fowl run is well-ventilated but protected from cold wind and rain by ensuring that holes in the roofs and floors are repaired.
2. Have about 5 meters space around the fowl runs clean and well-kept and should be free of grass and brushwood.
3. Let your birds out to free range where possible to reduce overcrowding and boredom
4. Set up dry dust bath in the fowl run should space allow
5. Keep the fowl run clean and dry by topping up fresh dry bedding on regular basis spot clean as well as top up with fresh and dry bedding. Spread lime powder, ammonium

sulphate etc. to maintain the dry condition.

6. Regularly remove any wet and soiled bedding or any with mould or fungal growth
7. If the rains are ongoing, clean the fowl run thoroughly when it gets dry, or earlier
8. Ensure quality poultry feed is purchased from reputable manufacturers in bulk where possible before or during the rainy season to reduce absorption of moisture during transportation. Feed should be kept in dry storeroom with good ventilation and on wooden platform/pannets. If storeroom indoor humidity is high or there is water dripping in into the room for long periods, it can cause serious fungus and mold infection.
9. Never feed poultry with aflatoxin contaminated food as this will reduce egg production, slow growth, low food conversion, liver tumors and even death of the birds. Ducks and turkeys are more tolerable to maximum level 0.1ppm aflatoxin than other poultry.
10. To keep the system free of diseases, there is need to spray in and around the fowl runs with germicide/ bactericidal and insecticides spray so as to reduce disease causing organisms, mosquitoes, flies and other insects that increase during the rainy season.

Finally, during the rainy season, a farmer has to be alert and lookout for any signs of the above mentioned diseases and act quickly to isolate sick birds, clean the fowl run, spray and then diagnose the problem before treating the illness.

Information supplied by the Zimbabwe Free Range Poultry Association (ZFRPA).

What can farmers do to improve soil conditions and minimise run-off?

- Understand your soils and tackle the fields that pose the greatest risk of pollution and flooding
- Dig holes during wetter months to assess the state of the soil structure
- Address compaction issues; ascertaining the depth of compaction will determine which piece of machinery is best suited to tackling the problem. Then dig a hole and check that the machine is removing the compaction
- When planting maize, consider the use of early drilling and early maturing varieties of maize, leading to early harvesting. This gives time to address any potential post-harvest soil problems

How can they minimise erosion?

Here are some ideas to help keep the soil in the field and avoid the environmental and economic impacts of erosion.

- Use crops to create ground cover — Avoid bare ground in winter
- Avoid capping and compaction — It helps reduce soil run off containing nutrients and pesticides
- Be aware of field contours — Long unbroken slopes can encourage run off. Make use of hedges, grassland, woodland and buffer strips to halt the movement of water and soil
- Cultivation techniques — Do not create very fine seedbeds, which can cap and slake after heavy rainfall
- Focus on soil — Helps keep a stable soil structure, which is less likely to be broken down by raindrops
- Consider banded or tied ridges — Help prevent soil movement in potato crops on slopes but can interfere with harvesting operations
- Consider increasing or creating woodland cover — Helps reduce the loss of top soil and damage to soil fertility.
- What are the factors that affect the risk of erosion?
- Soil Type, structure and condition —

Sandy, silty and low organic matter soils are most vulnerable to erosion caused by the movement of water. Sandy and peaty soils are prone to erosion caused by wind

- Crop cover — Bare soil in winter encourages water movement across the soil surface, so make use of cover crops
- Slope — Erosion can occur on any slope
- Compaction — Where rain can't filtrate, erosion is more likely to occur
- Cultivations — Excessive cultivations create the greatest risk
- Seedbed — Fine tilth and level seedbeds encourage capping
- Cropping — Root crops, maize and vegetables pose the greatest risk
- Straw disposal — Surface and incorporated crop residues will help add soil stability and aid infiltration
- Field drainage — Good drainage prevents the surface accumulation of water

Can cover crops help prevent erosion?

Avoiding bare ground in winter is a key way of minimising erosion, especially when working in challenging soil or weather conditions. A survey looking into resource management practices undertaken on farms across the south west examined how many farmers are actually planting cover crops to reduce run off and minimise erosion on their farms.

Why is runoff important?

- Historically the main sources of pollution from agriculture were slurry related, either from collapsed slurry stores or slurry running off the fields. These could usually be traced back to a single source and resulted in large fish kills. These problems have diminished thanks to better management, but the Environmental Management Agency (EMA) evidence shows that there are increasing problems caused by soil washing into rivers
- Sediment runs off fields into watercourses, making it difficult for spawning fish as the gravel beds get covered in sediment



Soil erosion is known to cause significant economic losses

Pig farming hygiene and biosecurity

♦ From Page 7

themselves through the following:

Behaviour

When an animal is sick there is change from normal behaviour. A sick animal will be passive and it will isolate itself from others. Its movement will not be free and easy. It will be disinterested in what will be happening in its surroundings.

Appetite

During feeding check to see whether the animal is feeding. A sick animal normally goes off feed. A pig loses weight if it's not feeding for a long period.

Respiration

Should be normal and regular. Heavy breathing is indicative of problems in the

lungs. Adult pig breathes 10-20 times per minute and younger pigs more often. Breathing is quicker if the pig has high temperature or if excited.

Skin and mucous membranes

The colour of the skin and mucous membranes should be reddish if the animal is healthy.

Hair coat

A sick animal will have dull hair coat. Hairs should be lying close to the skin.

Body temperature

One can take the rectal temperature of the pigs to determine if they have a fever. The normal body temperatures for the pigs are given below: Adult pigs: 38.0-39.5°C (growing and lactating sows)

38, 5-40, 00 degrees Celsius (pregnant sows)



BROILERS can be marketed live or dressed depending on the market preference. However, it is cheaper to market live birds especially for the smallholder farmer.

Sales value can be lost with poor packaging. An attractive package will help to make good sales.

Packaging and Marketing

An attractive package will help to promote good sales.

Broilers can be marketed live or dressed depending on the market preference. However, it is more convenient for a smallholder farmer to market live birds to processors and abattoirs since it is less laborious and there is no need for refrigeration.

Marketing of poultry

The best marketing strategy is to establish market before the inception of a project. This should be done in consideration of transportation costs as well as handling and packaging expenses. The farmer should decide whether to sell live or slaughtered birds depending on the prevailing costs of production, market requirements and accessibility and availability of storage facilities. In general marketing is a management process.

It involves identifying, anticipating and satisfying customer requirements profitably. Needs and wants of the target group and putting in place mechanisms to meet those needs are very important to the chicken producers. Seven marketing elements (the Ps) should be considered in marketing chickens. The first 4 Ps are Product, Price Place and Promotion

Product

These are meat, eggs and manure. Farmers should produce eggs or chickens that customers want rather than produce what they themselves want (customer-oriented production). Therefore, the products depend on what the customers want at a certain time and may not necessarily be the same for the same people at different times. The choice of product to be produced and sold also involves taking the right decision on quality, quantity, colour, taste, design, and branding, packaging, labelling, product range, other after sales services.

Price

Price may attract or scare away customers. Price is associated with the value of the product. Pricing questions like: How much are customers prepared to pay for an egg or chicken? For what price are the competitors selling the same or substitute product? This will help to guide farmers in pricing

Place

Chicken products should be distributed and made available at the right location, at the right time and in right quantities. Major factors that facilitate actual movement of goods from point of origin to point of use include order-processing, warehousing, inventory and transportation. Channels of distribution from the producers should be well defined. Potential markets (places) can be other farmers, clinics business centres, schools, churches and urban chain stores. Contracts can be arranged with urban retailers to allow farmers to sell their produce collectively; this allows them to enjoy benefit of economies of scale.

Promotion

In general promotion means informing and attracting potential customers to buy your products and involves advertising, sales promotions, personal selling, public relations and publicity. Advertising can be done using signboards, posters, newspapers, magazines, radios, televisions and electronic media (Internet). Incentives that motivate farmers

Marketing of Poultry



The farmer decides whether to sell live or slaughtered birds depending on the prevailing costs of production

like giving out one egg for free at the start of marketing can attract buyers.

The other 3Ps-Physical environment, participation/people and process are also important. For example, the physical environment should be clean and attractive, the people doing the selling should look smart, clean and honest and the process in which selling is done should be polite and friendly.

In any business, there are threats and opportunities.

Chicken farmers must be aware of threats and at times turn these threats to opportunities. Marketing opportunities always arise in a society and should be fully utilised.

Availability of markets

Farmers need to identify the market for their poultry well before they commence production and should desist from the practice of looking for a market when their birds or eggs are ready for sale. There are several things that need to be considered when identifying the market. These include:

- distance from the farm
- transport availability
- competition
- producer price on offer
- Always seek markets close to your poultry enterprise.

Key factors to consider in poultry pro-

duction

Poultry production can be very profitable in Zimbabwe if the business is properly managed. Understanding the important factors that influence poultry production is a pre-requisite for setting up and managing a poultry enterprise.

Due consideration should therefore be taken of factors that will assist the farmer in key decision making. The key factors that should be considered before making the decision to venture into poultry production include the following:

Housing

Different types of poultry and age groups require different types of housing. Housing designs should be able to offer adequate ventilation and protect birds from stress due to extreme weather conditions, and from predation.

Poultry houses should be constructed in a way that will allow the stockman to carry out his daily duties with relative ease and provide comfort to the birds. Poor housing designs can lead to farmer fatigue, to disproportionate access to feed by the birds, to inefficient utilization of space, to feed wastage and to poor productive performance of the birds, etc.

The types of poultry house to be constructed, their physical orientation on the ground and their location should take cogni-

sance of the needs for bio-security and preventing the spread of diseases into and out of the property.

Business plans and budgets

Poultry producers need to take a business approach in their plans. This is essential whether they will be financing the enterprise from their own resources or intend to borrow money to set up the enterprise.

Therefore, every poultry farmer, big or small, needs to develop a business plan with a budget, which must show that he/ she understands what the costs, benefits and profits are going to be. Banks or any other lenders will demand to see a business proposal with a clear business plan.

Using commercial feeds

Chicken feeds can be used for guinea fowl production.

The feeds are rather expensive but they give better growth rates. Practical experience from some large-scale producers have shown that it is possible to feed broiler or layers feeds to the guinea fowl and get very good performance. The feed however should not contain the coccidiostat Elancoban (Monensin) as it is sometimes fatal to the birds. The birds may be fed as suggested in marketing.

Adapted from FAO