ZIMPAPERS
AUGUST 2024
ISSUE NO. 23
AGRICULTURE JOURNAL

Soil testing for evidence-based management

Soil testing

Soil pH analysis

Soil testing for evidence-based soil management, improved crop productivity

Emmanuel Chikwari

SOIL testing is an important step in crop production. The results of a soil test must be presented in a way that is easily interpreted by the farmer to manage their soils for optimum production. Therefore, results from a soil test should give information that can be used by the farmer without difficulties. Determining the pH and fertility level through a soil test is the first step in planning a sound nutrient management programme.

Importance of soil testing

Information that is obtained from soil testing should address the following:

- Amounts of nutrients available for use by the intended crop.
- Soil conditions, (for example, acidity, salinity, compaction) that may enhance or hinder crop productivity.
- Management interventions that will allow for profitable agricultural production.
- Advisory recommendations that are given to the farmer indicate the following information:
- Whether the soil requires lime for correcting acidity (low pH).
- The type of lime (calcitic or dolomitic) that should be applied and in what amounts.
- Types of basal and top-dressing fertilisers required and the quantities to be applied per unit area.

Soil nutrient management

Precision agriculture requires us to consider the 4R nutrient stewardship in optimising crop productivity. This entails adding the Right fertiliser, in the Right quantities, at the Right time, with the Right placement. This can only be achieved through a robust soil test at reputable laboratories.

The Chemistry and Soil Research Institute under the Agricultural Research, Innovation and Specialist Services in the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development offers this service at affordable prices to our esteemed farmers. The full package ensures lime recommendations for correcting acidic soils (pH levels below 5, 5 for most crops) and fertiliser recommendations for the farmer's target crop.

The 4R nutrient stewardship

- **Right amount —** the proper application rate. This information is provided for each soil sample analysed for a given target crop.
- **Right source —** applying the proper type. It is important to note the type of fertiliser that should provide the desired nutrient in the required amounts.
- **Right placement —** This includes having specific fertiliser types for designated places and also using the appropriate method of application for a given fertiliser product. Once a soil test is conducted, recommendations are made on how to apply the fertilizer to ensure efficient utilisation of the resource.
- **Right timing —** applying at the correct time for maximum benefit by the crop. Lime requires to be applied at least three months before planting. Basal fertilisers are applied at planting while top dressing is done once the crop has emerged and during plant growing period.

Soil pH analysis

- Determines acidity or alkalinity of the soil.
- Soil acidity affects nutrient availability and plant growth.
- Lime is recommended to increase pH to optimum range.
- Each crop has its own optimum range.
- The minimum target pH for maize is 5.5.
- The minimum target pH for soyabeans is 6.0.
- Improving soil pH increases fertiliser use efficiency

Soil nitrogen analysis

- Nitrogen gives green colour to plants.
- It is required for food production by plants through
- photosynthesis.
- Increases plant growth.

Deficiency of nitrogen results in:

- yellowing of leaves, stunted growth, thinning of stems, early/premature flowering, wilting of plants

Soil phosphorus analysis

- Phosphorus promotes root growth, stimulates tillering, and hastens maturity.

Symptoms of phosphorus deficiency include:

- stunted growth, dark purple colour of older leaves, poor root development.

Soil potassium analysis

- Potassium is required for various physiological processes.

Potassium helps plants to:

- use water better, be more drought-resistant, and fight off pests & diseases

Deficiency symptoms include:

- brown scorching and curling of leaf tips,
- chlorosis (yellowing) between leaf veins,
- reduced plant growth,
- reduced seed and fruit development.

Conclusion

It is pertinent for farmers to consider soil testing before planting any crop. Farmers should always allocate time to activities that include soil sampling and testing so that they achieve their intended goals at the right time.

The author is the Head, Chemistry and Soil Research Institute Agricultural Research, Innovation and Specialist Services in the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development


Soil nitrogen analysis


Soil phosphorus analysis


Soil potassium analysis

www.zimra.co.zw

VACANCY NOTICE

Applications are invited from suitably qualified persons to fill the following posts within the Zimbabwe Revenue Authority (ZIMRA) - an equal opportunity employer.

HEAD STRATEGY - STRATEGY RESEARCH & INNOVATION- LEVEL 5 (1 POST)

Key Responsibilities
- Coordinates ZIMRA strategic planning process and ensure adherence to the Planning Calendar.
- Facilitates Strategic Planning Conferences and Review Workshops.
- Produces the ZIMRA Strategy documents namely the Five Year Strategy, Agency Strategic Performance Plan and the Programme Strategic Performance Plans.
- Provides advice to Senior Management on project prioritisation and strategic fit.
- Provides IRBM technical support to all divisions in the formulation of Sub-Programme Strategic Performance Plans to ensure alignment with the Corporate Strategy.
- Ensures management performance measurement metrics are aligned to the Corporate Strategy.
- Produces Performance Contracts for the Board Chair and Commissioner General and assist all Heads of Divisions in producing IRBM Compliant Performance Contracts.
- Tracks strategy implementation and assisting divisions with their strategy reporting obligations to ensure timely reporting.
- Develops ZIMRA Key Performance Indicators to monitor Performance and Results
- Conducts regular Strategy Monitoring and Evaluation.
- Produces quarterly and annual strategy performance reports.
- Leads automation of the ZIMRA Corporate Dashboard.
- Coordinates Strategy Implementation and Monitoring Committee Meetings.
- Identifies key strategic risks and ensure they are managed, reported or escalated as appropriate.
- Writes ZIMRA Annual Reports including design layout, printing and distribution.
- Coordinates the ZIMRA Change Management Programme including preparing stakeholders for reforms and change.
- Any other duties as assigned by the Director Strategy, Research and Innovation.

Job Skills and Competencies
- In - depth knowledge of Integrated Results Based Management and Monitoring & Evaluation.
- Ability to collect, compile and analyse data and prepare comprehensive reports.
- Ability to manage and coordinate projects.
- Strong strategic thinking and analytical skills.
- Good organisational and interpersonal skills.
- Maintains high levels of confidentiality and discretion with sensitive information.

Qualifications and Experience
- BSc Honours Degree in Business Studies /Management/Economics/Accounting or Social Science.
- MBA or Master's Degree in Strategic Management, Monitoring and Evaluation or Equivalent.
- Additional qualifications in Project Management and M & E an added advantage.
- Knowledge of ZIMRA Processes and Systems.
- Sound knowledge of taxes.
- Minimum of five (5) years' professional experience in Corporate Strategy or Research & Policy.
- Clean Class four (4) driver's licence.

ENTERPRISE RISK ANALYTICS MANAGER - CORPORATE RISK, - LEVEL 8 (1 POST)

Key Responsibilities
- Continuously monitor the business environment for emerging risks to identify, assess, evaluate and mitigate the authority's exposure to the identified risks.
- Determine which analytical tools can be used to assess and quantify risk for specific projects/divisions
- Perform analytics operational, market and credit risk-related matters
- Prepare and ensure the execution of the CRC work plan to ensure Divisional targets are met.
- Prepare periodic risk management reports tailored to the relevant audience including Risk registers, Risk Control Self Assessments, Business Continuity Plans, Risk and Compliance Assessment reports, and Incident reports.
- Liaise with different divisions and risk owners to address issues related to risk identification, measurement and mitigation.
- Champion the streamlining, standardization, and automation of risk data management processes
- Implement and maintain the Authority's risk and compliance management policies and frameworks.
- Review and evaluate company policies, and procedures to identify risk areas and advise management.
- Build risk awareness amongst staff by providing support and training within ZIMRA
- Provide leadership, supervision and mentoring to risk management supervisors and also managing performance to ensure the effective performance of the Division.

Job Skills and Competencies
- An analytical mind-set and strong statistical skills.
- Self-starter with the ability to work under pressure.
- Uphold unquestionable integrity and commitment to duties.
- Flexibility to work during odd hours or adverse weather conditions if required.
- Effective communication and interpersonal skills.
- Ability to collaborate with various departments and stakeholders.
- Good organisational, people, and time management skills.

Qualifications and Experience
- A Bachelor's degree in Risk Management, Business Studies, Finance, Mathematics, Statistics, Accounting, Economics, ICT or a business related discipline.
- At least 5 (five) years of postgraduate experience in Risk Management
- Professional qualifications/certifications such as FRM, CRISC, CERM, CISA, CIA, CFE, CRMA or equivalent.
- An MBA/MSc in Risk Management, Data Analytics, Finance, Accounting or related fields would be advantageous.
- Experience in Customs/Domestic Taxes or Tax environment is an added advantage.

LOSS CONTROL OFFICER - INTEGRITY MAMAGEMENT - LEVEL 9 (1 POST)

Key Responsibilities
- Carries out investigations as assigned by the Integrity Manager.
- Implements the Integrity management work plan.
- Carries out special projects to recover lost revenue.
- Engages with other strategic law enforcement agencies.
- Conducts out lifestyle audits to ensure ZIMRA staff lives within means.
- Maintains databases for all investigations, hotline and lifestyle audits.
- Compiles integrity and sectional periodic reports
- Identifies and recover ill-gotten wealth.
- Conducts corruptions diagnostic assessments.
- Conducts corruption risk trend analysis to identify corruption hot spots.
- Collaborates with other relevant stakeholders for recovery of assets.

Job Skills and Competencies
- Ability to meet set deadlines, maintain confidentiality and prioritise multiple tasks.
- Ability to work both independently and as part of a team.
- Self-starter with the ability to work under pressure and beyond stipulated hours.
- Unquestionable integrity and commitment to duty.
- Good analytical skills.
- Strong communication and presentation skills along with ability to work in a highly collaborative environment
- Ability to work with minimum supervision

Qualifications and Experience
- A Bachelors' Degree in Accounting/Economics/Intelligence & Security/Forensic Investigations/Data Science or equivalent.
- A Master's degree in any one of the above and similar qualifications is a distinct advantage.
- Good understanding or ability to master multiple operational systems added advantage.
- Minimum five (5) 'O' levels including English language, Mathematics and any science subject.

PROCUREMENT OFFICER (SUPPLY CHAIN SPECIALIST) - PROCUREMENT MANAGEMENT UNIT, - LEVEL 9 (2 POSTS)

Key Responsibilities
- Ensures that all procurement strategies and processes are in place for each procurement category in terms of price, quality and delivery targets which enables the authority to function.
- Ensures that value for money is achieved, including Terms and conditions, supplier selection or de-selection, evaluation and rationalisation of supply chain solutions including vendor managed inventory, supplier consignments and safety stock.
- Contributes in the initiation and development of a creative and innovative procurement processes (e-Procurement).
- Reviews, comparing, analysing and approving products as well as services to be purchased.
- Processes contract terminations and extensions.
- Facilitates development of supplier relationship management strategies to be employed throughout the supplier base.
- Ensures all procurement activities are done in compliance with the Public Procurement and Disposal of Public Assets Act [22:23] and Internal procedures, alignment of the act and procedures and relevant laws.
- Reviews all awarded tenders through the Procurement Management Unit review meetings.
- Prepares PRAZ monthly, quarterly and annual reports.
- Engages with internal stakeholders to ensure positive process development in line with operational environment.
- Monitors and reviews performance of Procurement Assistants and Graduate Trainees.

Job Skills and Competencies
- Ability to meet set deadlines, maintain confidentiality and prioritise multiple tasks.
- Ability to work both independently and as part of a team.
- Self-starter with the ability to work under pressure and beyond stipulated hours.
- Unquestionable integrity and commitment to duty.
- Good analytical skills.
- Strong communication and presentation skills along with ability to work in a highly collaborative environment
- Ability to work with minimum supervision
- Good organisational, people and time management skills.

Qualifications and Experience
- A Graduate Degree in Purchasing and Supply Chain Management/ Logistics Management/Business Studies or equivalent.
- A Master's Degree in Supply Chain Management is an added advantage.
- A minimum of three (3) years' experience in Public Procurement.
- Proficient in SAP, report writing and data analytics
- Studying towards CIPS certification or a holder of CIPS Certification is an added advantage.

Interested candidates should submit applications, accompanied by a detailed Curriculum Vitae **by 9 August 2024. All applications should be emailed to: ZimraRecruitment@zimra.co.zw clearly stating the position applied for and addressed to:**

The Director, Human Capital
Zimbabwe Revenue Authority
6th Floor ZB Centre
Corner First Street / Kwame Nkrumah Avenue
P. O. Box 4360
HARARE

Please note female candidates are encouraged to apply and only shortlisted applicants will be responded to.

DEE:DI6651478

"We are here to serve"

AGRICULTURE JOURNAL

Editor's Note

A BIG thank you to all the cotton farmers who chose to soldier on and produce the white gold in the face of the El Nino-inspired drought that ruthlessly compromised the hectarage and yield projections they had dreamt to achieve this past season.

It takes someone with nerves of steel too go through the harrowing experience of investing in the production of a crop fully-knowing that it might not make it to maturity, which obviously throws a damp on the prospects of recouping production costs.

This ability by farmers to pace their decision-making is one of the things that non-farmers just do not know about agriculture, yet is pivotal to the performance of every farm. And, honestly, it's such a pleasure to behold. There are, of course, other keys to professional decision-making too, including a commitment to continual learning, disciplined cost management, an understanding of risk, and a knowledge of financial capability.

I give all the credit to these gallant farmers who besides growing cotton, tobacco and other high-rewarding crops, made sure they produced food crops that every one of us so dearly loves to lay their hands on.

But let me get back on track. I am talking here of a very welcome development that we are witnessing in this year's seed cotton marketing season. Merchants seem to be getting it right this time around. They have adopted a payment model of paying farmers their dues upon delivery of produce.

Call it poetic irony or whatever you want but the boot is on the other foot for the farmers this time around. This payment system seems to be making up for the anxious moments farmers went through at the hands of the El Nino-inspired drought that rocked the season. At least something good has come out of the disappointing season.

I hear some merchants are even doing away with the local currency component that Government had recommended under the 75 foreign currency and 25 percent local currency payment ratio and paying the initial grade D of US$0, 32 in United States dollars only. This is a good omen for farmers. They are getting value for their crop at one go. Some of the merchants are also reportedly paying grade prices from last season.

AGRICULTURE JOURNAL

EDITORIAL TEAM
Editor: Obert Chifamba
E-mail: obert.chifamba@zimpapers.co.zw
Phone: 0772 886 986

Agricultural Specialist Writer: Edgar Vhera
E-mail: edgar.vhera@zimpapers.co.zw
Phone: 0774 844 050

Reporters:
Elton Manguwo **Phone:** 0785 335 676
E-mail: leonmangwo@gmail.com

Design, Layout & Sub Editing
Editorial Production & Design Department
Tatenda Moyana
Phone: 0776 413 627

Advertising & Marketing
Advertising & Marketing Executive: Charles Shungu
E-mail: charles.shungu@zimpapers.co.zw
Phone: 0773 048 277

For all enquiries:
Address: PO Box 396, Corner Sam Nujoma and George Silundika, Harare
Phone: 08677004323, +263 (24)2795771

This tobacco plant is stunted due to root knot nematode. On hot days, infected plants wilt more readily than healthy plants. — Photo: Kenneth Seebold, UK

Effective nematode management in tobacco and tomato cultivation

Kundai Zvaraya

NEMATODES, particularly the root-knot brand — Meloidogyne species, pose a significant threat to tobacco and tomato crops. These microscopic soil-dwelling pests can cause severe damage, leading to stunted growth, reduced yields, and poor crop quality. Effective management of nematodes is crucial for maintaining healthy crops and ensuring profitable harvests. Here are some proven strategies for managing nematodes in tobacco and tomato growing.

Understanding the Nematode Threat to Zimbabwean tobacco and tomato farmers.

Nematodes are tiny, worm-like organisms that live in the soil and feed on plant roots. They cause characteristic galls or knots on the roots of infected plants, disrupting nutrient and water uptake. Symptoms of nematode infestation include wilting, yellowing of leaves, and overall poor plant health. The damage can be severe in both tobacco and tomato plants, leading to significant economic losses for farmers.

Crop Rotation and Resistant Varieties

One of the most effective ways to manage nematodes is through crop rotation. Rotating susceptible crops like tobacco and tomatoes with non-host crops such as cereals or legumes can help break the nematode life cycle. Additionally, planting nematode-resistant varieties of tobacco and tomatoes can significantly reduce the impact of these pests. Many seed companies offer varieties bred for resistance to common nematode species.

Soil Solarisation

Soil solarisation is a non-chemical method that uses solar energy to reduce nematode populations in the soil. This technique involves covering the soil with clear plastic sheets for four to six weeks during the hottest part of the year. The trapped heat increases soil temperatures to levels that are lethal to nematodes and other soil-borne pathogens. Soil solarisation is most effective in regions with high temperatures and intense sunlight.

Organic Amendments

Adding organic amendments to the soil can improve soil health and reduce nematode populations. Organic matter such as compost, manure, and cover crops like mustard or marigold can enhance soil structure, increase beneficial microorganisms, and release natural nematicidal compounds. Incorporating these amendments into the soil before planting can help create a less favorable environment for nematodes.

Chemical Control

When nematode populations are high, chemical control may be necessary. Nematicides are chemicals specifically designed to kill nematodes. It is essential to choose the right nematicide and apply it correctly to achieve effective control. Always follow the manufacturer's instructions and safety guidelines when using chemical treatments. Integrated pest management (IPM) practices should be employed to minimise reliance on chemicals and reduce the risk of resistance development.

Biological Control

Biological control involves using natural enemies of nematodes to reduce their populations. Beneficial nematodes, fungi, and bacteria can be introduced into the soil to target and kill harmful nematodes. For example, the fungus Paecilomyces lilacinus and the bacterium *Bacillus firmus have shown promise in controlling root-knot nematodes. These biological agents can be applied as soil drenches or incorporated into the soil.

Regular Monitoring

Regular monitoring of nematode populations is crucial for early detection and effective management. Soil samples should be taken and analysed for nematode presence before planting and during the growing season. Monitoring allows farmers to assess the effectiveness of their management strategies and make necessary adjustments.

Resistant Rootstocks

Grafting susceptible tomato plants onto nematode-resistant rootstocks is another effective method. This technique involves joining the scion (the upper part of the plant that produces the fruit) to a rootstock that is resistant to nematodes. The resistant rootstock prevents nematodes from establishing and damaging the roots, while the scion continues to produce

◆ To Page 5

Effective management of nematodes in tobacco and tomato cultivation in Zimbabwe

◆ From Page 4

healthy fruit.

Fallow Periods

Implementing fallow periods, where fields are left unplanted, can help reduce nematode populations. During these periods, nematodes starve without a host plant, leading to a natural decline in their numbers. Covering the soil with black plastic or growing non-host cover crops during the fallow period can enhance the effectiveness of this strategy.

Resistant Varieties and Breeding

Research and development of nematode-resistant varieties are ongoing. Using seeds and plant varieties that are bred for resistance to nematodes can significantly reduce infestations. Collaboration with agricultural research institutions such as TRB can provide access to the latest resistant varieties and breeding techniques.

Good Agricultural Practices

Implementing good agricultural practices (GAP) is essential for managing nematodes. These include proper field sanitation, using clean planting materials, avoiding the movement of contaminated soil and equipment, and practicing good irrigation management to prevent the spread of nematodes through water.

Integrated Pest Management (IPM)

An integrated pest management (IPM) approach combines multiple strategies for effective nematode control. This holistic approach includes cultural practices, biological control, chemical treatments, and regular monitoring. By integrating various methods, farmers can achieve sustainable and long-term control of nematode populations.

Community Collaboration

Collaboration with neighbouring farms can enhance nematode management efforts. Community-wide adoption of nematode control measures, such as synchronised crop rotation and area-wide soil solarisation, can reduce nematode pressure across a larger area, benefiting all farmers involved. This can be beneficial to rural community farmers who struggle with the expenses of managing nematodes

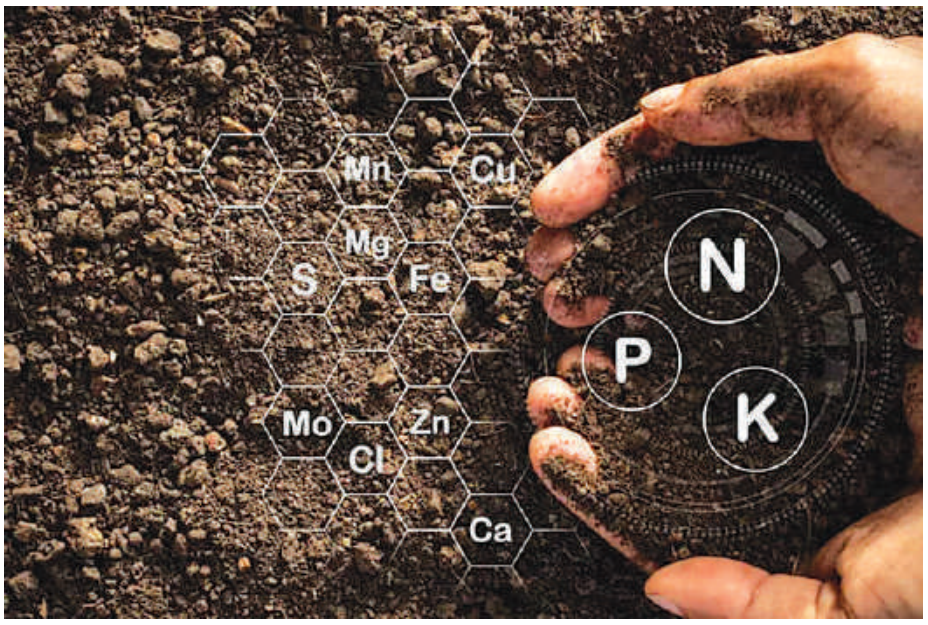
Managing nematodes in tobacco and tomato growing requires a comprehensive approach that combines cultural, biological, and chemical methods. By implementing crop rotation, using resistant varieties, practicing soil solarisation, adding organic amendments, employing biological control agents, and regularly monitoring nematode populations, farmers can effectively manage these pests and protect their crops. Sustainable nematode management not only ensures healthy plants and higher yields but also contributes to long-term soil health and farm profitability. Collaboration, education, and the adoption of innovative practices are key to overcoming the challenges posed by nematodes in Zimbabwean agriculture.

The author is an agronomist and founder of Farm Makeover Company
+263784672644

Enhancing crop productivity through integrated nutrient management (INM)

Desire Tavengwa

INTEGRATED nutrient management (INM) is a holistic approach to managing the nutrient requirements of crops by combining different sources of nutrients in a balanced and sustainable manner. It involves the judicious use of organic manures, inorganic fertilisers, biofertilisers, and other nutrient sources to optimise crop production while minimising environmental pollution and maintaining soil fertility. INM aims to provide crops with a balanced supply of essential nutrients, considering their specific requirements at different growth stages. This approach takes into account the nutrient content of the soil, crop nutrient demands, nutrient availability from different sources, and the potential for nutrient losses through leaching, volatilisation, or runoff. By integrating different nutrient sources, INM helps to improve soil health, enhance nutrient use efficiency, reduce fertiliser dependency, and promote sustainable agriculture. It also considers the use of organic waste materials, such as crop residues, animal manure, and compost, to recycle nutrients and improve soil organic matter content.



The objectives of INM are as follows:

Optimising nutrient use efficiency:

INM aims to maximise the efficiency of nutrient utilisation by crops. By providing a balanced supply of nutrients based on crop requirements, it helps to minimise nutrient losses and reduce the overuse of fertilisers. This leads to improved nutrient uptake by plants and enhances crop productivity.

Maintain Soil Fertility: INM focuses on maintaining and improving soil fertility over the long term. By incorporating organic manures, crop residues, and other organic sources of nutrients, it enhances soil organic matter content, improves soil structure, and promotes beneficial soil microbial activity. This helps to sustain soil fertility and productivity.

Minimize Environmental Pollution: INM aims to minimise the negative environmental impacts associated with excessive and imbalanced fertiliser use. By optimising nutrient application rates and timing, it reduces the risk of nutrient runoff, leaching, and volatilisation, which can lead to water pollution and greenhouse gas emissions. INM promotes the use of environmentally friendly practices to protect air, water, and soil quality.

Promote Sustainable Agriculture: INM is a key component of sustainable agriculture. It emphasises the use of organic and natural sources of nutrients, reducing reliance on synthetic fertilisers. It encourages the recycling of nutrients through the use of crop residues, animal manure, and compost, contributing to a circular economy and minimising waste. INM also supports the long-term viability of agricultural systems by maintaining soil health and fertility.

Adapt to Local Conditions: INM takes into account the specific nutrient requirements of different crops, as well as the soil and climatic conditions of a particular region. It considers the availability and accessibility of nutrient sources, local farming practices, and the socioeconomic factors of farmers. INM provides customised nutrient management strategies that are tailored to local conditions, ensuring optimal crop growth and productivity.

> The objectives of INM align with the principles of sustainable agriculture, aiming to achieve both economic and environmental sustainability in nutrient management practices.

INM is important for several reasons:

Increased Crop Productivity: INM helps to optimise nutrient availability and utilisation by crops, leading to improved crop productivity. By providing a balanced supply of nutrients based on crop requirements, it ensures that plants have access to the essential nutrients they need for healthy growth and development. This results in increased yields and better quality produce.

Sustainable Soil Fertility: INM focuses on maintaining and improving soil fertility over the long term. By incorporating organic manures, crop residues, and other organic sources of nutrients, it enhances soil organic matter content, improves soil structure, and promotes beneficial soil microbial activity. This helps to sustain soil fertility, ensuring the long-term productivity of agricultural land.

Environmental Protection: Excessive and imbalanced use of chemical fertilisers can lead to environmental pollution. INM promotes the judicious use of fertilisers, minimising the risk of nutrient runoff, leaching, and volatilisation. By optimising nutrient application rates and timing, INM reduces the negative impact on water quality, air quality, and greenhouse gas emissions. It supports environmentally friendly practices that protect natural resources and ecosystems.

Cost-effectiveness: INM helps farmers optimise the use of nutrients, reducing the overuse and wastage of fertilisers. By providing a balanced nutrient supply, it ensures that farmers get the maximum benefit from their fertiliser investments. This leads to cost savings in fertiliser expenses, making nutrient management more economically viable for farmers.

Climate Change Resilience: INM practices, such as the use of organic manures and crop residues, contribute to carbon sequestration in the soil. This helps to mitigate climate change by reducing greenhouse gas emissions and enhancing soil carbon storage. INM also promotes the use of climate-smart practices that improve the resilience of agricultural systems to climate variability and extreme weather events.

Customized Nutrient Management: INM takes into account the specific nutrient requirements of different crops, as well as the soil and climatic conditions of a particular region. It provides customised nutrient management strategies that are tailored to local conditions, ensuring optimal crop growth and productivity. This approach maximises the efficiency of nutrient use and minimises nutrient losses.

INM involves the integration of different sources of nutrients to optimise crop productivity while maintaining soil fertility and environmental sustainability.

The key components of INM and their benefits are:

Organic Manures and Composts: Organic manures, such as farmyard manure, compost, and vermicompost, are rich sources of organic matter and essential nutrients. They improve soil structure, enhance water-holding capacity, and promote beneficial soil microbial activity. Organic manures provide slow-release nutrients, ensuring a steady supply of nutrients to plants over time. They also help in carbon sequestration, mitigating climate change impacts.

Crop Residues: Crop residues, such as straw, stubble, and leaves, can be incorporated into the soil or used as mulch. They contribute to soil organic matter, improve soil structure, and enhance nutrient cycling. Crop residues act as a nutrient source for subsequent crops, reducing the need for external fertiliser inputs. They also help in reducing soil erosion and conserving soil moisture.

Green Manures and Cover Crops: Green manures are crops grown specifically to improve soil fertility. They are usually leguminous crops that fix atmospheric nitrogen and provide a source of organic matter when incorporated into the soil. Cover crops are planted to cover the soil surface between main crops, preventing soil erosion, suppressing weeds, and adding organic matter to the soil. Green manures and cover crops help in nitrogen fixation, nutrient recycling, and soil conservation.

Biological Nutrient Sources: Biological nutrient sources include biofertilisers and microbial inoculants. Biofertilisers contain beneficial microorganisms, such as nitrogen-fixing bacteria, phosphate solubilising bacteria, and mycorrhizal fungi. These microorganisms enhance nutrient availability to plants, promote root development, and improve nutrient uptake efficiency. Biological nutrient sources reduce the reliance on chemical fertilisers, contribute to soil health, and minimise environmental pollution.

Chemical Fertilisers: While INM emphasises reducing the dependence on chemical fertilisers, they still play a role in providing essential nutrients to crops. The key is to use chemical fertilisers judiciously, based on soil testing and crop nutrient requirements. Proper nutrient management ensures that fertilisers are applied in the right amounts, at the right time, and in the right proportions. This approach optimises nutrient use efficiency, reduces nutrient losses, and minimises environmental impacts.

Nutrient Recycling: Nutrient recycling involves the utilisation of agricultural by-products, such as crop residues, animal manures, and agro-industrial waste, as nutrient sources. These by-products are transformed into organic fertilisers or composts, which can be reused in agricultural systems. Nutrient recycling reduces waste, conserves resources, and provides a sustainable source of nutrients for crop production.

By integrating these components, INM provides a holistic approach to nutrient management. It ensures a balanced and sustainable supply of nutrients to crops, promotes soil fertility and health, minimises environmental impacts, and enhances the overall productivity and resilience of agricultural systems.

Here are some key pieces of advice for farmers regarding INM:

Soil Testing: Conduct regular soil testing to assess the nutrient status of your soil. This will help you understand the specific nutrient requirements of your crops and guide you in making informed decisions about nutrient management.

Nutrient Planning: Develop a nutrient management plan based on the results of soil testing and crop nutrient requirements. Consider the use of organic manures,

◆ To Page 11

From Farm Records to Farm Budgeting

Edgar Vhera

Introduction

IN our previous edition, we tackled farm records as the first step in taking farming as a business, this month we go a rung higher by looking at farm budgeting.

Farm budgeting can generally be defined as the estimation of financial inflows and outflows of a particular enterprise or a whole farm. Examples of farm budgets include gross margin, whole farm, partial and cash-flow budgets.

Just like in other businesses, farmers handle considerable amounts of money in their businesses. Money must be managed effectively to maximise on profit.

This article has been prepared under the following key deliverables;

- Purpose of enterprise budgets
- Preparing an enterprise budget
- Break-even analysis
- Whole farm budget
- Partial budgets

Uses of budgets information

Budgets provide information crucial to decide what and how much to produce as well as the resources needed. The following are some of the uses of budgets:

- Itemise the financial aspects of the farming business.
- List the inputs and production practices required by an enterprise.
- Evaluate the performance of different farm enterprises.
- Estimate benefits and costs of changes in production practices.
- Provide the basis for a total farm plan.
- Show the capacity of the farming business to carry risk.
- Support applications for credit (show the ability of the business to pay debt).
- Inform all interested parties of the costs incurred in producing an agricultural product.

Enterprise budgets

These are developed on the basis of the smallest rational unit such as per hectare or acre for crops and weight (450kg) in the case of livestock for three reasons:

- The amounts and values are expressed in constant and understandable terms
- Easy to compare different sizes of enterprises
- Easy to compare with other sources of information

Developing a farm budget

Step 1: Defining a production programme

- At this stage, farming families should define the production programme (livestock or cropping). This step is influenced by factors such as:
  - The family's farming experience and preference.
  - Market availability.
  - Climatic potential of farming area.
  - Resources available to the family.

Step 2: Estimating and specifying input requirements

- At this stage, the family needs to specify and estimate the inputs that are needed for the production programme as defined in Step 1.
- This is achieved by estimating input requirements for each operation and estimating the costs of inputs

Step 3: Estimating cost of production

- This stage involves estimation of all production processes anticipated.
- Each process or activity has to be priced realistically.
- Examples of production processes for a maize project are land preparation, planting, weeding, harvesting and marketing.

Step 4: Estimating quantity and value of output

- This stage involves estimating the anticipated quantity and value of output.
- This should be based on facts rather than wishful thinking.
- The most critical parameters to consider in this process are average yields and prices.

Step 5: Comparing costs and returns to determine net returns

- This stage involves comparing anticipated costs and returns to determine net returns.

Major sections of Enterprise Budget (Gross Margin Budget)

- **Title (Enterprise being considered)**
- **Income or revenue**
- **Operating costs**
- **Gross margin**
- **Ownership costs**
- **Net return**

Gross Income — is the total value of production from an enterprise. It includes sales, value of produce consumed at home and value of retained produce.

Variable Costs — are production costs that can be directly allocated to a particular enterprise in a production season. Variable costs are costs that can be avoided (for example, by not harvesting a crop, one avoids harvesting labour

To Page 11

Manyame Rural District Council

Stand No. 34
Postal Box 99, Beatrice
Tel: 065 218/239
Fax: 065 453

Email: ceo@manyamerdc.org.zw
www.manyamerdc.org.zw
Cell: 0785 491371

All correspondence to be addressed to the CEO

IMPORTANT NOTICE TO MURISA STANDS BENEFICIARIES AND RESIDENTS

Manyame Rural District Council notes with concern the non-compliance with offer and lease conditions and the continued illegal parceling and development of land within and outside the planned area and areas adjacent to Murisa Rural Service Centre.

CATEGORY 1:
BENEFICIARIES WHO HAVE NOT YET COLLECTED THEIR OFFER LETTERS FROM COUNCIL

Council is burdened by offer letters from beneficiaries who are yet to collect their offer letters. Please be advised that Council is giving the below listed clients up to **9 August 2024** to collect their offer letters and meet the stated offer conditions. All clients who shall fail to meet this deadline will have their offer letters withdrawn and they shall have no claim whatsoever over the stands. Council will proceed to take legal action and evict all non-complying clients who will be in occupation of the stands. Below is a list of the affected stand numbers;

2657, 5549,999, 5214, 5201 , 5971 , 5732 , 5727, 5720 , 5716 , 5714 , 5713 , 5712 ,5711,5707,5706,5703 ,5699 ,5694 ,5676 ,5673 ,5665 ,5693,5692,5664 , 5663 ,5609 ,5604 ,5601 , 5586 ,5580 ,5570 ,5563 ,5562 ,5222 ,5745 ,5736 ,5755 ,5769 ,5762 ,5748 ,5749 ,5974 ,5981 ,5869 ,5401 ,5398 ,5386B ,5384 ,5449 5448A ,5446 ,5445 ,5427 ,5434 ,5433A,5414A, 5413 ,5405 ,5469 ,5464 ,5463E ,5462A ,5461 ,5460 ,5458 ,5932 ,5499 ,5498 ,5497 ,5493 ,5484 ,5465 ,5467 , 5413B ,5474 ,5545 ,5543,5542,5538 ,5536 ,5535,5534 ,5532 , 5525,5524,5523 ,5522, 5521 ,5519, 5508 ,5508, 5507, 5502 ,5501, 5597 ,5777 ,5538, 5547 , 5824C, 5819A, 8220, 6450, 6906 ,6893, 6938, 6768, 2930, 2973, 2966 ,2925, 2877, 2818, 2816 ,2815 2814 2813 2812 ,2753 2750 ,2748 ,2747 ,2746, 2742, 2738, 2736, 2718 ,2724, 2713, 2711 ,2693, 2685, 2684, 2682, 2667, 2658, 2661E, 2649, 2646 ,2645, 2634, 2627, 2617, 2616 ,3090, 2592, 2580, 2579, 2530, 2642 ,2565, 2517, 2504, 2493, 2476, 2461 ,2459 ,2458 ,2451 ,2450,2315,2311 ,2309 ,2290B ,1984,2287 ,2276 ,2274B ,2272C , 2269 ,2169 ,2168 ,2167C , 2167B, 2167A ,2115 ,2111 ,2101 ,2099 ,2096,2082 ,2079,2074,2055 ,2052,2040 ,2039 2012 ,2213C ,2011 ,976 ,975,948,934,930 ,919 ,912,911 ,910 , 909 , 908,893, 879,995,987, 982 ,978 ,849B ,849,847,844 ,841 ,838 ,837 ,714 ,810B ,721 ,807B ,804B ,715 ,792 ,788 ,787 ,786,781 ,751 ,715 ,713B ,898 ,737 , 689,685, 671 ,656 E, 656D, 655 ,635A ,647B ,641B,640B,635B,632B ,630B ,632B ,624B ,623B ,622B ,612 ,612B ,547 ,602 ,598B ,596 ,592A ,589B,586 ,582 , 570,564, 547 ,525B ,525A,524 ,524 ,521B , 621B, 491, 489, 485B, 485C, 437, 395, 378, 376,358 ,357,352 ,334,334 ,252B ,252B ,198 ,195 ,194 ,192B ,189 , 187, 3924B, 3994A,3990,3993, 3925B,3949,3948,3878,3877, 3864B,3852,3832,3810 ,3809,3799 ,3779,3778 ,3767A ,3747B ,3747A,3746 ,3736 , 3703, 3700, 3677, 3676, 3673, 3659, 3627, 3618,3605 ,3604, 3603,3599, 3598B, 3597B, 927, 3579, 3516 ,3506 ,3500 ,3499 ,3595B ,3495B ,3479B ,3478, 3475, 3462, 3457, 3440D, 3450, 3391, 3376, 3375, 3374 , 3335, 3309,330,3292,3271B , 3267A, 3280B, 3280B, 3279A,3539, 3278B ,3278 ,3277 ,3266A , 3270A, 3274B, 3274B,3270B, 3270,3269A, 3269B, 3269B,3264B,3262B,3256,3246,3246,3241,1957,1149A,1943,1934,1933,193,1922,1919, 1918, 1655, 1640, 1976, 1636, 1621, 1614, 1606, 1605, 1588, 1541, 1526, 1586, 1512,1508,1502,1494,1493,1491,1489,1489,1468,1441,1387,1383,1382,1381,1380,1377,1373,1370,1365,1364,1356,1353,1345,1344,1338,1337,1334,1332 ,1328,1328 ,1319 ,1317 ,1299 , 1295,1277,118,1178, 1149B,1417,1140,1098,1065A,1064B,1063B,1058B,1043B,1043,1042,1027,1022 ,1010,1010,1008,1007,1006 ,1006 ,1005 , 1003, 1001,1000, 5541 ,5816A , 5817B,5815A, 5804, 5803 ,5794, 5792 ,5950,5947, 5927, 5914 ,5908 ,5907 ,5905,5886 ,5886,5870 ,5882,5866 ,5861, 5855, 5850,5845,5842 ,5841 5836 ,5824A ,5823B, 5382B, 5382C, 5381C, 5364, 5351, 5351, 5348, 5344B, 5341, 5341,5333 ,5338 ,5332 ,5332 ,5331, 5331, 5329 ,5328 5327,5322 ,5321 ,5319 ,5315,5314 ,5316 ,5315 ,5315,5285 ,5271C , 5270 ,5271B,5271D ,5271F ,5270 ,5267,5267 ,5263D ,5263C,5262 , 5260B ,5258 ,5257 ,5257 ,5254A, 5254 ,5248A ,5248A ,5247A ,5240B,5231 ,5231 ,5230,5229,5228,5227, 5227A ,5226B,5226A ,5224 ,5974 ,5159 ,5152, 5160,5163 ,5126,5124 ,5041 ,5062,5058,5052 5118,5181 ,5322 ,5186 ,5111 ,5816,5118,5166 ,5066 ,5106,5107, 5110,5088,5223,5064 ,5076 ,5016 , 5010 ,5008,5003,4984,4970,4968,4967,4951,4950,4945,4917 4919,4916,4905 ,4891,4873,4872,4859 ,4852,4845, 4844 ,4843,4842, 4202, 4834, 4838, 4836, 4835, 4834, 4841,4828,4827, 4826 ,4825 ,4824 ,4820B,4820,4816,4815 4767,4765 ,4765 ,4761 ,4791 ,4789 ,4789 ,4788 ,4787 , 4788,4787,4786,4782 4782,4779,4774B,4770,4746,4744 ,4730A,4730C,4730,4724,4722,4720C,4720A ,4720 4719,4718A ,4718 ,4718 ,4715 ,4659 , 4516A ,4561B ,4527,4525,4522 ,4510,4508, 4493 ,4479,4435 ,4406,4390 ,4383A ,4386,4378C,4373 ,4371,4362,4323,4137E ,4354C 4037B ,4272 ,4217 , 4172,4162 ,4160 ,4160,4147D, 4157C ,4137D,4137C,4136,4119, 4098 ,4094 ,4095,4081,4030C,4028 ,3241 ,3231 ,3230,3225 ,3224 ,3221,3218 ,3213 , 3210, 3195, 3193, 3190, 3187 ,3170 ,3168 ,3166,3152,3151,3136,3114 ,3110,3107,3106, 3105,3104,3076,3069 ,3068 ,3065 ,8234,8215 ,8213 , 8179,8176,8168,8162B,8168D,8156 ,8152B,8150,8150,8144A,8115B ,8107,8224,8105,8102,8096,8084,8094,8083 ,8082 ,8078 , 8066,8063,7988B,7988A,7985B,7984A,7983B,7971B,7982B ,7973B,7912A,7903,8019,8015,8013,8006,8005,7995, 7989A,7989 , 7989A ,7988,7981A,7981,7979A,7978,8240,7968A,7967C ,7967B,7962,7953,7947,7948,7947,7946,7943 ,7933 ,7930 ,7928,7926, 7915,7912C,7911F,7910,7718,7904,7902,7900,77899,7891,7887,7885 ,7884,7875,7874,7868,7865G,7865C ,7858,7823 ,7292 , 7807, 7710,7409,7692, 7865B ,7865F ,7850

CATEGORY 2:
BENEFICIARIES WHO HAVE NOT YET MET THEIR OFFER CONDITIONS

Council notes with concern that some beneficiaries who collected offer letters dating back to 2016 have not yet met their offer conditions despite the expiry of the given payment period. The beneficiaries in this category are being given up to 9 August 2024 to meet their offer conditions. Failure to meet this deadline will result in the offer letters being withdrawn and they shall have no claim whatsoever over the stands. Below is a list of stand numbers within this category;

7852,7849,7845 ,7841,7846 ,7831 ,7830,7828 ,7827 ,7827 ,7825 ,7821 ,7814 ,7806 ,7804,7799,7796B ,7796A ,7793 ,7784 ,7777 ,7775 ,7772 ,7767 ,7766 , 7760 , 7713,7696,7695, 7690 ,7675 ,7665 ,7664 ,7663 ,7658 ,7652 ,7639 ,7630 ,7619 ,7616 ,7615 ,7615 ,7614 ,7611 ,7599,7594,7587,7586 ,7585 ,7581 , 7578 ,7577 ,7574,7573,7569 , 7569 ,7565,7562 ,7557 ,7553 ,7552 ,7550 ,7551 ,7548 ,7546 ,7543,7541 ,7522 ,7514 ,7469,7454 ,7447B ,7442 ,7460 ,7439E , 7439D ,7438E,7436 ,7433 ,7413 ,7408,7401 , 7390,7385,7382,7367 ,7359 ,735,7349,7347 ,7339 ,7334 ,7332 ,7331 ,7325 ,7325 ,7322 ,7319,7307 ,7301 , 7291,7290,7285 ,7278 ,7277 ,7271 ,7262 ,7261 ,7260 ,7250 ,7249 , 7240,7236 ,7229 ,7225 ,7167,7158 ,7096 ,7084 ,7083 ,7074A , 7073A,7066B,7062A,7061B,7022,7033A,7061B,7048,7031,7014,7013 ,7009,7008 ,7010D ,7003 ,7002 ,6028 , 6022 ,6002 ,6110 ,6102 ,6099 ,6095 , 6090, 6089 ,6087,6086,6085,6059,6042,6040,6031,6290A,6288B,6283D ,6272,6245,6237,6211 ,6202 ,6189 ,6180 ,6137 ,6136,6152 , 6150B ,6149 , 6145 ,6141 ,6130 ,6129,6125 ,6121,6119 ,6175 ,6112 ,6117,6378 ,6376 ,6345,6339 ,6335,6322 ,6320 ,6317 ,6315 ,6313 , 6309,6308A,6301B,6299B,6294B , 6292,6571 ,6570 ,6562 ,6548,6549,6569,6533,6441,6438,6429,6423,6418,6415,6414,6539,6538,6532,6525 ,6524 ,

6517,6501,6500,6492 ,6488 ,6454 ,6410 ,6416 ,6396 , 6394 ,6811 ,6906 ,6941 ,6955 ,6965 ,6966B,6965,6784 ,6783 ,6781 ,6965C ,6939 ,6887 ,6872 , 6896,6857 ,6823 ,6843 ,6839 ,6832 ,6830 ,6829,6823 ,6819 ,6817,6812 , 6910,6773 ,6770 ,6759 ,6758 ,6804 ,6755 ,6749 ,6743 ,6735 ,6724 ,6724,6719 , 6711 ,6707 ,6699 ,6693 ,6689 ,6687 ,6669 ,6650A ,6642 ,6640 ,6639 ,6629,6624 ,6621 , 6617, 6614,6612 ,6601, 6600 ,6592, 6590 ,6587 ,6578 ,6576 ,6568 , 6567,6363,6357,6356,6576,6574 ,1775 ,1678,1912,1911 ,1908 ,1917 ,1916 ,1904 ,1902 , 1901,1898,1891,1881 , 1879,1870,1862,1823 ,1821 ,1819,1816, 1814 ,1808 ,1799 ,1995 ,1874 ,1741,1732 ,1712,1711 ,1710 ,1706 ,2934 ,954 ,3607B,921 ,7072A,7072A,5232A , 8221 ,2861,2896 ,2618 2705

CATEGORY 3:
BENEFICIARIES WHO HAVE NOT YET MET THEIR LEASE CONDITIONS

There is a high number of clients who are reneging on their lease conditions and many with expired leases, as well as outstanding allocation and land development levy payments which are long overdue. The concerned clients are hereby given up to 9 August 2024 to honour their lease conditions failure of which the leases will be cancelled without any further communication and the stands shall be repossessed.

5760, 5339, 3540B, 3297A, 3297A, 5839, 5334, 5334, 5335, 5334, 5323, 4778B, 4724, 4024, 8207, 8016, 7549, 6304, 6540, 6412, 5572, 3607, 5233B, 5146, 4819, 1173, 3268B, 1044, 1057B, 546A, 5395B, 192A, 1152A, 6778, 6937, 6801, 1863, 2619, 2618, 2979, 3099, 2739, 2664, 2557, 2313, 2314, 2312, 2310, 2307, 2308, 2306, 2047, 953, 3277B, 247, 1037B, 557B, 1147B, 3281A, 533, 1151B, 3594, 604A, 5766, 3476, 5818, 5867, 5320, 5320, 4936, 8004, 5251, 5252, 5252, 5253, 5253, 5231B, 5231B, 5342, 5342, 5399A, 7066B, 6889, 1815, 7021, 6327B, 2739, 6593, 6198, 5782, 6278, 5813, 2654, 6871, 6293B, 1981, 2178, 2873, 2028B, 2870, 6726, 6103

CATEGORY 4:
BENEFICIARIES SETTLED ON ROADS, WETLANDS, OPEN SPACES, INSTITUTIONS, COMMERCIAL AND INDUSTRIAL AREAS

Council now intends to open roads as per the approved layout plan, however, there are still people settled on roads, wetlands, open spaces, institutions, commercial and industrial areas despite being offered alternative stands whilst others were placed on the alternative stands list. Those given alternative stands should move to their offered stands forthwith and failure to comply will result in Council taking legal action against them. Clients without stands who were on the ground during the re-planning and re-organization exercise should approach the office for assistance. The above stated clients are being given up to 9 August 2024 to comply with this directive.

CATEGORY 5:
ILLEGAL SETTLERS ON PLANNED STANDS, ROADS, WETLANDS, OPEN SPACES, INSTITUTIONS, COMMERCIAL AND INDUSTRIAL AREAS

In terms of the law it is illegal to occupy land without authority and any such development should be supported by an approved layout plan, development permit or valid lease agreement. Further to that, individuals should have duly approved building plans and all construction stages must be approved by council. Members of the public are hereby strongly warned against illegally occupying planned stands, roads, open spaces, institutions, wetlands, commercial and industrial stands under the false hope that their structures will be regularised. Accordingly, the public is further implored against entertaining any persons or people who may come forward purportedly representing Council, the state and other government institutions. The above stated illegal settlers are hereby given up to 9 August 2024 to demolish their illegal structures and return the land to its original state failure of which Council will proceed to prosecute and take legal action against the perpetrators.

CATEGORY 6:
ILLEGAL SETTLERS IN SEKE COMMUNAL AREA

There has been an unprecedented illegal occupation of seke communal land by illegal settlers. Occupation and development of communal land can only take place where there is a communal land permit issued by Council in consultation with traditional leadership. Manyame Rural District Council has no plans to urbanise Seke communal lands as is being paddled by some unscrupulous individuals. Currently Council is in the process of updating village registers and settlers in Seke Communal are being advised to attend village consultation meetings being conducted in their wards in order to benefit from the exercise. All those persons stated above who have not complied with the provisions of the law are being given up to 9 August 2024 to comply or risk prosecution, legal action and eviction from the land concerned.

Below is the procedure for allocation of communal land.

1. All prospective settlers foreign to the village in question are required to obtain a clearance letter from their village heads of origin or an inter-district transfer from their district of origin.
2. Original villagers are required to approach the village head with their requests and other prospective settlers also approach the village head of the area to be settled who after inspecting the inter-district transfer and clearance from former village head calls for a village assembly.
3. The minutes of the village assembly together with an attendance register of the people present are submitted to Council accompanied by a recommendation letter from the local Councillor.
4. Council carries out a verification exercise with the technical assistance of relevant government departments such as EMA and AGRITEX to ascertain the suitability of the area for human settlement.
5. The Executive Committee on Land Management considers the verification report and submits it to the Agriculture and Natural Resources Committee for discussion and recommendation, then the matter is taken to full council for ratification.
6. If the application is successful the area is pegged by Council with the technical assistance of relevant government departments such as EMA and AGRITEX in the presence of the VIDCO.
7. The stands are pegged by Council and a site plan is produced indicating the measurements of the area and its relationship to the surrounding areas. The standard size of a homestead is 50m by 50m (2500 square meters).
8. Council then drafts a communal land permit which is duly signed by the Chief Executive Officer with conditions on how the land is to be developed and occupied.
9. The communal land permit does not confer title for the land and does not allow the holder to sale the land as it will remain state land.
10. Armed with the communal land permit a prospective settler is then allowed to occupy the land and start construction of their home.

CATEGORY 7:
PROJECTS, MINING ACTIVITIES, INSTITUTIONS IN SEKE COMMUNAL AREA AND THE RESETTLEMENT AND COMMERCIAL FARMING AREAS

A lot of developments are occurring in Seke District without the approval of Manyame Rural District Council. Council is noticing the proliferation of big projects in communal, resettlement and commercial farming areas without the requisite permits and leases. Aspiring investors are required to submit their applications and project proposals and obtain community consent through consultations before their applications are considered by the relevant government departments culminating in Council issuing them with a development permit for their respective projects. Project owners are advised to register their projects with Council by 9 August 2024 or risk prosecution, legal action and eviction from the land concerned.

PLEASE SAY NO TO LAND BARONS!!!!!

STANDS ON OPEN MARKET

Manyame Rural District Council has the following stands available for sale on a first come first serve basis to applicants on the waiting list of the centre and use being applied for.

CENTRE	STAND USE	SIZE RANGES
Beatrice	Industrial	5000 m^2 and 10000m^2

F. GUTA - CEO

Paying the right price for your herd bull

Eddington Gororo

THE season of selling and buying breeding stock is upon us. Numerous auction and farm sales are lined up, epitomised by the annual National Breed Sale (NBS) to be held on Friday, July 26 at Mt Hampden Sale Pens. Stud breeders are supplying the market with thousands of pedigree stock — bulls and heifers, bulls and does, rams and maiden ewes. In buying breeding stock, always consider genetics, performance, visual appeal and cost price. In this article, I share insights into how you could work out the right price to pay for your desired herd bull.

1. Introduction

Bulls make just three to four percent of the breeding herd, yet they contribute half the genetics of each calf. A good bull should improve herd productivity and economic performance of the enterprise.

Acquiring breeding bulls that best fit the needs and long-term objectives of the operation is critical. A farmer should ideally consider genetics, performance, and visual appeal in prospective animals. The next consideration in the purchase decision is the cost price for each of the prospective bulls and its effect on the bottom line.

Buying a bull is often a business investment decision. A farmer must ask themselves: how much can the enterprise afford to pay for the bull? Will the operation realise a positive return on investment (ROI) on the purchase?

2. Bull price determinants

The maximum price one pays for any breeding animal should be determined by the expected value it brings. This can be related to how well his genetics, performance traits and observable attributes align with the specific breeding goals and herd needs of the enterprise.

This value will be realised through number of calves sired each year and per lifetime, and how well they perform relative to herd mates and previous generations. When his progeny is used as replacement stock, the influence of that sire becomes even more prominent for many years to come.

Economic factors such as supply, demand, and breed popularity often influence pricing and market trends for breeding stock. Price trends may also differ across different age groups, sale venues and geographic regions and this should be explored. The Zimbabwe Herd Book (ZHB), breed societies and auctioneers often collect and publish these trends on their websites and social media pages.

Sometimes the buyer may have opportunity to negotiate the price paid for a breeding bull, especially with off-season and direct farm purchases. With prior market research, a farmer can pre-determine his or her maximum bid price for each prospective animal when making an auction purchase.

Table 2 Bull cost per calf sired (USD) for different levels of bull purchase price and number of cows serviced

Bull price (US$)	No. of cows serviced (calves sired, 80% CR)				
	20 (16)	25 (20)	30 (24)	35 (28)	40 (32)
$1,500	37.81	30.25	25.21	21.61	18.91
$2,000	45.63	36.50	30.42	26.07	22.81
$2,500	53.44	42.75	35.63	30.54	26.72
$3,000	61.25	49.00	40.83	35.00	30.63
$3,500	69.06	55.25	46.04	39.46	34.53
$4,000	76.88	61.50	51.25	43.93	38.44
$4,500	84.69	67.75	56.46	48.39	42.34
$5,000	92.50	74.00	61.67	52.86	46.25
$5,500	100.31	80.25	66.88	57.32	50.16
$6,000	108.13	86.50	72.08	61.79	54.06

Source of data: Author

Table 1 Estimated sire costs for a beef cattle operation under different bull purchase price scenarios

Item	Bull purchase price options							
	1	2	3	4	5	6	7	8
1. Investment assumptions								
Purchase price (US $) (A)	2,500	3,000	3,500	4,000	4,500	5,000	5,500	6,000
Useful life in years (C)	4	4	4	4	4	4	4	4
Salvage value (US $) (B)	400	400	400	400	400	400	400	400
2. Annual sire costs (US $)								
Bull ownership (D = (A-B)/C)	525	650	775	900	1,025	1,150	1,275	1,400
Supplementary feed (E)	250	250	250	250	250	250	250	250
Health – med, vet, vaccines (F)	80	80	80	80	80	80	80	80
Total cost (G = D + E + F)	855	980	1,105	1,230	1,355	1,480	1,605	1,730
3. Reproductive outcomes								
No. of calves (30 cows x 80% CR) (H)	24	24	24	24	24	24	24	24
4. Analysis of sire costs (US $)								
Per calf born (I = G/H)	35.63	40.83	46.04	51.25	56.46	61.67	66.88	72.08
Per breeding cow on farm (J)	28.50	32.67	36.83	41.00	45.17	49.33	53.50	57.67

Source of data: Author

3. Counting the cost

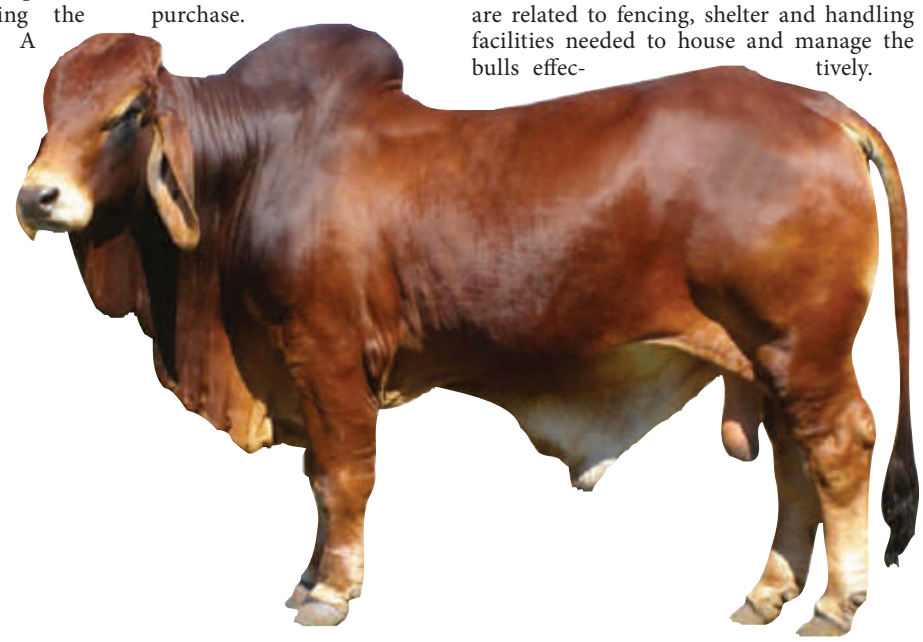
So, how can a cattle enterprise manager determine the most feasible price at which to buy a bull? People often make the mistake of purchasing a bull based on their bank account, rather than a fair assessment of its value to the enterprise. A breeding bull should be considered an asset and investment, whose value to the business is predicted beforehand.

For instance, if one buys a $10 000 bull for a 25-cow herd, is there a chance they will be able to recoup that investment in four to five years, selling yearlings or slaughter stock? It is important to count the numbers before making the purchase.

A cost-benefit analysis to determine what the desired bull is worth to the operation should factor in not only the purchase price, but also bull ownership costs such as annual use, maintenance and infrastructure expenses, and expected returns from the bull over several breeding seasons.

Annual use costs could be calculated as the difference between purchase price and salvage value divided by the useful life of the bull in years. This is simply a depreciation allowance. A bull has a useful lifespan of just four to five years due to declining fertility with age and risk of inbreeding should they be kept longer on the farm.

Bull maintenance costs include feeding, veterinary care, vaccinations and breeding soundness evaluations. Infrastructure costs are related to fencing, shelter and handling facilities needed to house and manage the bulls effectively.



On the revenue side, bulls provide two sources of potential returns: (1) they sire calves and (2) contribute to their genetic merit. Therefore, bull investment returns depend on such aspects as bull-to-cow ratios, reproductive outcomes and progeny performance.

4. Cost of siring calves

As a general guide, I have done basic calculations on the cost of siring calves in a hypothetical 30-cow operation for different bull purchase price scenarios.

The bulls are assumed to be genetically similar and only differ in pricing. Each year, a bull is expected to sire 24 calves, at an annual calving rate of 80 percent. Each bull will be sold for meat at a salvage value of $400 at the end of four years. The results are given in Table 1

The calculations shown in Table 1 reveal that the purchase price of a herd bull definitely impact overall sire costs of the enterprise. Given the assumptions, the bull cost per calf sired range from $35, 63 to $72, 08 for a bull acquired at $2 500 and $6 000 respectively.

Bull costs per calf born under different bull purchase prices and changes in the number of cows serviced are given in Table 2. Increasing prices of bulls means higher sire costs for each calf born on the farm.

However, increasing the number of cows serviced by the bull would reduce bull costs per calf. With 20 breeding cows, a bull bought at $3 000 would cost $61, 25 per calf. By increasing the number of cows serviced to 40, the cost would reduce to $30, 63 per calf. This is true only if conception rate and bull health is not compromised. Reduced conception rates would increase costs per calf sired.

The penultimate question is: would each of these cost levels be acceptable? Will they be recouped by the business? The answer lies in the value of the progeny sired — wean weights, market weights, prices and so forth.

5. Conclusions

A bull is an investment and asset to a cattle producer. His potential impact can be worked out through cost-benefit analysis. Sire costs depend on purchase price and annual maintenance expenses for the bull. Value of the bull is contingent upon its longevity, number of cows serviced and progeny sired, and the market value of the progeny.

Before making a bull purchase decision, one would have to determine a fair price at which to buy the bull, so that the enterprise remains profitable. Contact your breeding and reproduction expert for help with working out such investment decisions.

About the author

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

◆ From Page 7

Tcosts and fuel costs).

Gross Margin — this is gross income minus variable costs. It is a measure of enterprise viability.

GROSS MARGIN = GROSS INCOME – VARIABLE COSTS				
Example of Crop Enterprise Budget				
Crop Enterprise Budget				
Description	**Unit**	**Quantity**	**Price/Unit ($)**	**Total ($)**
Income (Output x selling price)	Tonnes	6	250	1,500
Less Expenditure				
1. Land Preparation Costs				
Ploughing (Ox ploughing)	Labour days	1	45	45
Discing	Labour days	0.5	40	20
Marking	Labour days	4	5	20
Total Costs for Land Preparation				85
2. Planting Costs				
Seed	10kg	2.5	20	50
Basal fertiliser (Compound D)	50kg	4	30	120
Labour	Labour days	4	5	20
Total Planting Costs				190
3. Crop Maintenance Costs				
Top dressing (AN)	50 kg	4	33	132
Insecticide (Dipterex)	kg	4	5	20
Herbicides				
Alachlor	Litres	1.75	8	14
Dual	Litres	1.5	14	20
Gramoxone	Litres	1.5	15	24
Total Crop Maintenance Costs				210
4. Harvesting and Marketing Costs				
Labour	Labour days	16	5	80
Packing bags and twine	Units	120	0.2	24
Transport	Units	100	1	120
Total Harvesting and Marketing Costs				224
Miscellaneous Cost (10%)				71
TOTAL VARIABLE COSTS				780
GROSS MARGIN				720
Return Per Dollar Invested (RPDI) =GM/TVC				0.92

Interpretation and uses

- Choose enterprise with highest margin/area when land is limiting factor
- Choose enterprise with highest margin/labour day when labour is limiting factor

Important when assessing the following:

From Farm Records to Farm Budgeting

- The structure of the business in terms of costs and returns.
- The relative size and importance of each enterprise
- Results from previous years

Break-even analysis

Determination of critical point at which a certain action in the business enterprise will cover total costs.

- Farmer may want to know optimum hectarage of crop to produce viably (break-even area)
- Farmer interested to know minimum price per kg for a crop to cover production costs (break-even price)
- Farmer interested in minimum yield per ha to cover the costs (break-even yield)

Break-even yield =	Total Variable Costs/Output Price
For example, if total maize variable cost per hectare =	US$500
Price of maize per tonne =	US$300
Break-even yield =	500/300
	1.67 tonnes/ha

This means with a yield of 1.67t/ha, farmer will cover variable costs at given output price. At that yield Gross Margin is zero

Break even production unit

- Minimum production unit (area, herd size, batch size) a farmer should produce to cover all costs over and above variable costs at a given output and yield

To be continued . . .

Enhancing crop productivity through integrated nutrient management (INM)

◆ From Page 6

crop residues, green manures, cover crops, and biological nutrient sources to meet the nutrient needs of your crops.

Organic Matter Addition: Focus on increasing organic matter content in your soil by incorporating organic manures, compost, and crop residues. This will improve soil structure, enhance water-holding capacity, and promote beneficial soil microbial activity.

Balanced Fertiliser Application: Apply fertilizers in a balanced manner, considering the specific nutrient requirements of your crops. Avoid excessive or imbalanced fertiliser application, as it can lead to nutrient imbalances, environmental pollution, and reduced crop productivity.

Timing and Placement: Apply fertilisers at the right time and in the right place to maximise nutrient uptake by crops. This may involve split applications, where fertilisers are applied in multiple doses during the growing season, based on crop growth stages and nutrient demand.

Nutrient Recycling: Explore opportunities for nutrient recycling by utilising agricultural by-products, such as crop residues and animal manures. Convert these by-products into organic fertilisers or composts, which can be reused to replenish nutrients in the soil.

Crop Rotation and Diversification: Practice crop rotation and diversification to break pest and disease cycles, improve soil fertility, and reduce the reliance on external inputs. Different crops have varying nutrient requirements, and rotating crops can help maintain nutrient balance in the soil.

Water and Nutrient Management: Efficient water management is crucial for nutrient uptake by crops. Avoid over-irrigation, as it can lead to nutrient leaching. Implement water-saving techniques, such as drip irrigation or mulching, to conserve soil moisture and improve nutrient use efficiency.

Training and Education: Stay updated with the latest research and best practices in INM through training programmes, workshops, and agricultural extension services. Continuous learning and knowledge sharing will help you make informed decisions and adopt sustainable nutrient management practices.

Monitoring and Evaluation: Regularly monitor and evaluate the impact of your nutrient management practices on crop performance, soil health, and environmental sustainability. Adjust your nutrient management strategies based on the feedback received and strive for continuous improvement.

By following these practices, farmers can optimise nutrient use, improve soil fertility, reduce environmental impacts, and enhance the overall productivity and sustainability of their farming systems.

The author is an agronomist with Hurudza Agro-Consultancy — 0777605874 / 0717000679

Age determination in Dairy Animals

Dr Edson Chifamba

What is the function of the teeth in cattle?

A COW has flat-topped teeth in its lower jaw and only a hard pad of skin in the top jaw. There are no teeth in a cow's top jaw, because it does not need them. Instead, a cow grinds grass between its bottom teeth and the hard pad of skin, until the grass forms a soft ball that easy to swallow. Eruption times of incisors are the most reliable feature for age determination in cattle. As cattle continue to age, the teeth wear shorter, they loosen in the sockets and eventually drop out.

It is easy to estimate the approximate age of a heifer by inspecting the state of her teeth.

A calf may be born without teeth with the temporary cheek teeth erupting within a few days and the temporary incisor teeth within two weeks

The age at which the pairs of permanent incisor teeth erupt is as follows:

First incisor teeth	18–24 months
Second incisor teeth	24–30 months
Third incisor teeth	36 months
Fourth incisor teeth	40–48 months

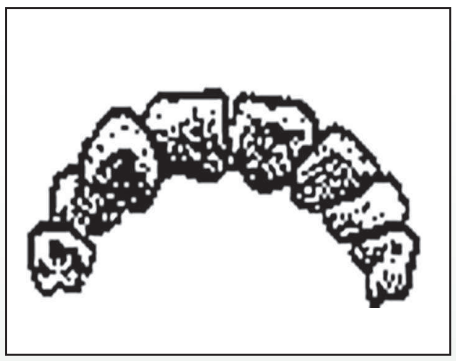
This is a very useful guide when objectively assessing the feeding management of young stock because poorly fed heifers may look healthy and relatively well grown, but if their first (or even second) incisor teeth have erupted they are likely to be much older than at first glance.

At approximately the age of between four and five, the last of the cow's permanent incisor teeth (the "corner" incisors) are cut, and are typically fully developed by the age of five. Therefore, at the age of five years, cows typically have all eight permanent incisors erupted and in use.

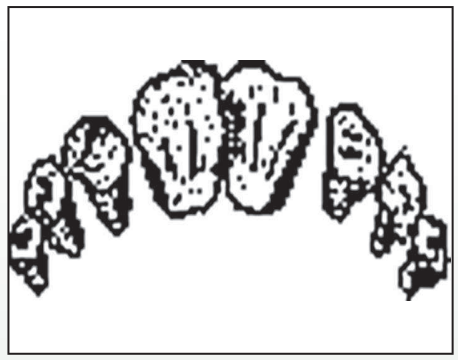
At this age the incisors are tall, relatively flat across the front (when compared to older ages), sharp at the top, and close together. From the age of six or more, estimating cattle age by their teeth is based on their degree of wear and becomes more difficult.

After the animal passed the sixth year, the arch gradually loses its rounded contour and becomes nearly straight by the twelfth year. In the mean- time, the teeth gradually become triangular in shape, distinctly separated, and show progressive wearing to stubs. These conditions become more marked with increasing age.

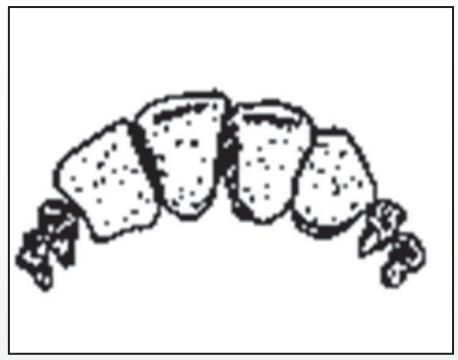
Figure 1. Dentition chart. At birth to 1 month



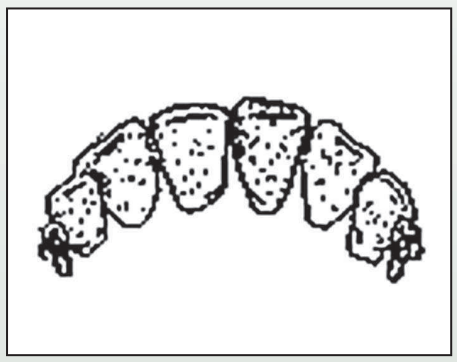
Two or more of the temporary incisor teeth present. Within first month, entire eight temporary incisors appear. — **At birth to 1 month**



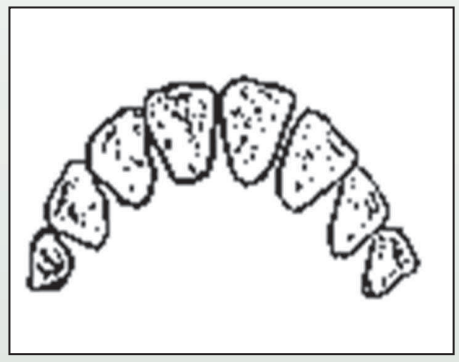
As a long-yearling, the central pair of temporary incisor teeth or pinchers is replaced by the permanent pinchers. At 2 years, the central permanent incisors attain full development. **— 2 years**



Permanent first intermediates, one on each side of the pinchers, are cut. Usually these are fully developed at — **3 years.**



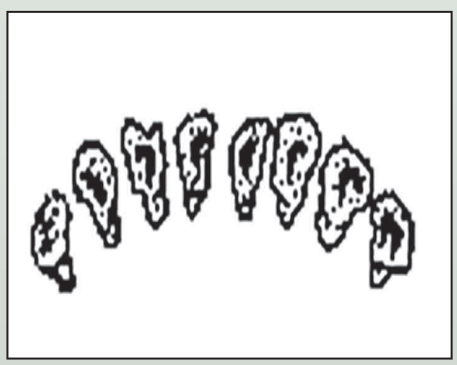
The second intermediates or laterals are cut. They are on a level with the first intermediates and begin to wear at **— 4 years.**



TThe corner teeth are replaced. At 5 years the animal usually has the full complement of incisors with the corners fully developed. **—4-4.5 years**

The permanent pinchers are levelled, both pairs of intermediates are partially levelled, and the corner incisors show wear. **— 5-6 years**

At 7 or 8 years the pinchers show noticeable wear; at 8 or 9 years the middle pairs show noticeable wear; and at 10 years, the corner teeth show noticeable wear. **— 7-10 years**



After the animal passed the sixth year, the arch gradually loses its rounded contour and becomes nearly straight by the twelfth year. In the mean-time, the teeth gradually become triangular in shape, distinctly separated, and show progressive wearing. **— 12 years**

The Writer is a holder of a PhD in Dairy Technology and an International Dairy Expert. He has worked as Dairy Scientist for UNDP in Tanzania, Technical Dairy Specialist for the East Africa Dairy Development in Kenya, Uganda and Rwanda and recently as Project Coordinator for the EU funded Transforming the Zimbabwe Dairy Value Chain for the future (TranZDVC). He is currently assisting dairy development in Botswana. He is reachable on: Email: dairydoctor@yahoo.co.uk, edsonchifamba@yahoo.co.uk Mobile: +263 774 836 438

The EU export market, a case study of the Swedish fruit and vegetable market

Bolton Kudzai Kakava

Introduction

ZIMBABWE is a signatory to the UK Eastern-Southern Africa Economic Partnership Agreement (UK ESA-EPA) and the EU interim Economic Partnership Agreement (EU iEPA) to enjoy duty and quota free access to these markets respectively. In addition to that, Zimbabwe signed a trade agreement with the United Arab Emirates (UAE) for Zimbabwean produce to access their market.

Furthermore, the country signed a citrus protocol with China to enable citrus produce grown in Zimbabwe to enter into the Asian country after meeting the phytosanitary requirements.

However, most farmers have limited knowledge about these trade agreements and how to access these global markets. In this article, I will use Swedish market for fruit and vegetables as an example to illustrate how producers can access the market.

Overview of market structure and players

The Swedish market for fresh fruit and vegetables largely depends on imports. As consumers increasingly prefer fresh to processed, there are opportunities to be found. This market study provides an introduction to the Swedish market for fresh fruit and vegetables, giving an account of its structure and trends, this from the perspective of Sweden being a market within the EU and what that means in practice.

Fresh fruit and vegetables in Sweden and the EU: market size and development

According to SCB, Sweden imports fresh fruit and vegetables to a value of €926 million. This share is much larger than the Swedish production, meaning Sweden relies heavily on imports of fresh fruit and vegetables. The European market for fresh fruit and vegetables is large and stable overall, with an interest in year-round supply of seasonal products and exotics. Europe is a major player in the fresh fruits and vegetables market, with traders operating globally, including in developing countries.

As a matter of fact, the share of developing countries in European supply is growing, reaching €15 billion of imports of fresh fruit and €3 billion of fresh vegetables in 2018. Intra-European trade represented the largest share for both categories: € 19 billion fresh fruit and €17 billion fresh vegetables in 2018. Fruit and vegetables represent the largest category of grocery sales in Sweden, representing 19 percent, followed by meat (17 percent) and dairy products (15 percent).

Seasonality and Swedish demand

Some fruits and vegetable represent 100 percent imports into the Swedish market. These are products which cannot be produced in the Swedish climate, such as bananas, citrus and peppers for instance. Locally produced products, the dependency on imports vary greatly. Tomatoes and apples, for example, are produced in Sweden but also imported, mainly from other European countries. For certain products, however, Sweden is almost self-sufficient. This is the case for carrots for example, for which 90 percent of the demand is met by domestic production, which can be found in the stores throughout the year. For pears, however, the domestic production only covers four percent of the Swedish demand.

Seasonality plays an important role both in Swedish and European demand for imports of fresh fruit and vegetables. For instance, cucumber and cauliflower are supplied by domestic production in the summer season, while there is no Swedish supply in the winter, hence demand is fully met by imports — largely from other European countries and countries close to Europe.

European seasonality also plays a role in Swedish imports. Spain is the most important producer of oranges in Europe, and the largest supplier to the Swedish market. In off-season, however, Sweden imports from Egypt, also a producer (and supplier not only to Sweden but also Spain), as well as the Netherlands and Germany, which are not producers but traders. The oranges traded through the Netherlands and Germany originate from South Africa and Egypt, the two largest non-European suppliers to the European Union. The seasonal demand means that for products available in Sweden and Europe only during certain months of the year, there are opportunities for producers who can supply during the other months.

Market structure and players on the Swedish fresh fruit and vegetables market

Large supermarket chains dominate the Swedish grocery market. Their share in overall retail is also significant, where the two largest supermarket chains are also the two largest retailers in the overall market. Supermarkets offer more than groceries, they also offer clothing, home textiles, garden articles and much more. Concentration is a general feature in the Swedish retail landscape, where half of the overall retail market is represented by 14 companies.

According to Svensk handel (2018) the Swedish grocery market,

where the freshest fruit and vegetables are sold, large retail chains dominate the market. Among these, ICA holds half of the market share, followed by Axfood (including supermarkets Willys and Hemköp), COOP and Bergendahls (with among other brands, supermarket City Gross). There are also smaller retailers on the market, but their market share is low compared to the large retailers. Different sources give different figures but their share is estimated at less than 15 percent of the Swedish retail market.

Certification and sustainability

An importer is liable for the product he places on the Swedish market, and in order to have proof of compliance with EU legislation, he often looks to food safety certification. GLOBAL GAP has become such a common requirement that it can be seen as a prerequisite for exporting to Sweden/Europe rather than an added value. GLOBAL GAP includes food safety and traceability, environmental and social welfare, as well as HACCP, which is also part of the European legislation.

Apart from GLOBAL GAP, food safety certification is generally required by all European and Swedish importers and the majority will require certification according to a product safety standard approved by the Global Food Safety Initiative (GFSI), for example BRCGS and FSSC 22000. There are two organic labels on the Swedish market: the EU organic logo, and the Swedish KRAV certification. The EU certification is the basis for products marketed as organic in the EU, as it certifies the minimum requirements for organic established by the EU.

KRAV is older and has a better consumer recognition in Sweden, although the requirement to include the EU organic logo on all organic production the EU, has led to increased recognition, at the expense of country logos such as KRAV. Nevertheless, KRAV still holds an added value in the view of Swedish consumers, while the EU logo is expected to continue to grow in recognition.

In conclusion, farms, food processing and feed manufacturing companies in Zimbabwe must comply with food safety standards in order to find their products or produce on international export markets such as Sweden.

Bolton Kudzai Kakava is a Regulations and Compliance Consultant and can be contacted via email at boltonkudzi@gmail.com or via mobile phone +263779579803.

Dairy Animal health

Dr Edson Chifamba

Maintaining animal health of smallholder dairy herds

- Although veterinarians are essential in times of health emergencies, smallholder dairy (SHD) farmers can do much to ensure their stock remain healthy and productive. The three most important disease problems in tropical dairy farms are scours in milk-fed calves, lameness and mastitis in adult stock.

Physical attributes of healthy and sick cows

- Healthy animals are alert, active, have bright eyes, with no discharge, smooth and shiny skin, breathe and urinate regularly and their tail moves to drive flies away.
- Signs of stress include loss of appetite, reduced daily milk yield, increased temperature, high respiratory rate, tongue protruding, open mouth breathing, inability to lie down.

Symptoms of health include:

Nutritional status: sick cows tend to lose weight due to depressed appetite, poor feed digestion or loss of body reserves.

Walking and standing: The way an animal moves can indicate pain in the body, the result of a traumatic injury or an infected hoof.

Eyes and ears: Eyes have a bright and lively expression with no discharge; sunken eyes indicate dehydration. Ears should be able to freely move around.

Skin, coat or mucous membranes: The skin of healthy cows is flexible and when pinched, should quickly return to normal; a lengthy delay will indicate dehydration, as will a dry nose. The coat should be smooth and shiny. The mucous membranes around the eye, nose and vagina should be pink to reddish in colour and be moist. In sick cows, these membranes can become either too red or too pale, the later indicating anaemia.

Figure 1. Visual recognition of lameness.

Healthy cows have a good appetite and eat with eagerness. Faeces and urine are discharged regularly with the faeces having a normal consistency. When digestion is disturbed, the cow's appetite decreases and the faeces is discharged too fast (scours) or too slow (constipation). Cows ruminate frequently when healthy (at least six to eight hours each day), and if she does not ruminate when resting, her digestion is disturbed.

Urine should be thin, yellow and clear; thick, mucous or red urine is an indication of ill health.

In healthy cows, respiration is quiet and regular, whereas in cases of unrest, fever, fatigue or heat stress, respiration rates increase. Coughing, nasal discharge, rapid or slow breathing can all be symptoms of ill health.

When a cow is sick, milk production drops, primarily due to decreased appetite.

Mastitis

Mastitis is an inflammation of the udder caused by a variety of microbes, mostly bacteria, that gain access to the interior of the mammary gland through the teat canal. These microbes live on the cow, its udder and in its environment, including the floor, faeces, soil, feedstuffs, water, plants and milking equipment and utensils. In response to these bacterial invasions, cells move from the blood stream into milk in order to fight the infection. Fortunately, these organisms are normally killed by pasteurisation and thus seldom cause disease in humans, unless the equipment is faulty or if raw milk becomes contaminated with these organisms.

Microbes that can cause mastitis are grouped into two main types:

- Contagious bacteria that spread from infected quarters to other quarters.
- Environmental bacteria, commonly present in the cow's environment.
- At low levels of infection, it may go unnoticed in the form of subclinical mastitis. However, it eventually becomes sufficiently severe to be classed as clinical mastitis leading to pathological changes in the mammary tissue and physical, chemical and bacteriological changes in the milk.
- If the infection is not cleared up, chronic mastitis may result. Infected quarters can lose up to 25 percent of their potential milk production and produce only poor quality milk.

The economic importance of mastitis:

- reduced milk production.
- treatment costs.
- discarded milk with antibiotic residues.
- possible death of infected animals.
- udder damage and the interruption to breeding improvement programmes.

Mastitis may be attributed to:

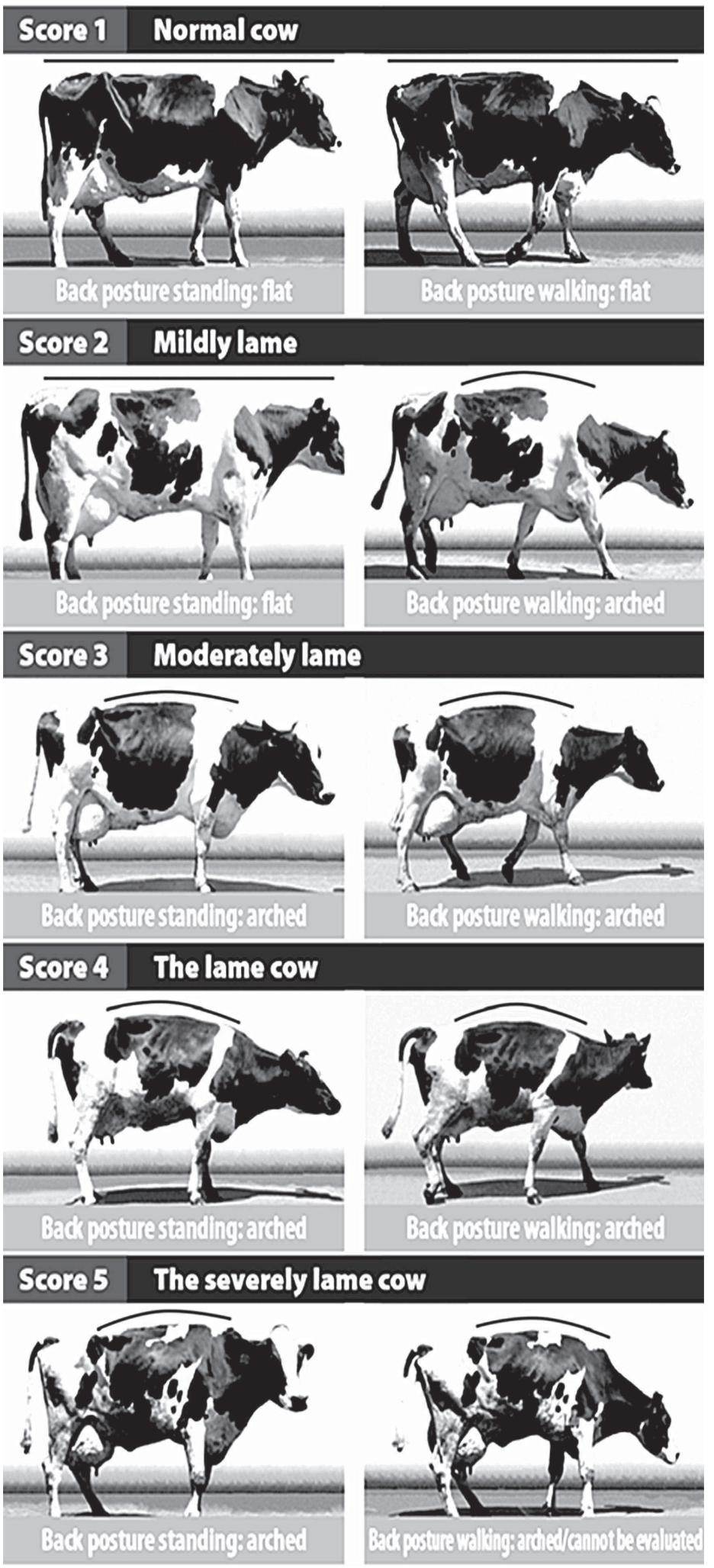
- poor management.
- improper milking procedures.
- In appropriate of housing.
- Poor nutrition and stress.

These all interact with genetic and physiological factors such as stage of lactation, milk yield, milk flow rate and pregnancy.

The Writer is a holder of a PhD in Dairy Technology and an International Dairy Expert. He has worked as Dairy Scientist for UNDP in Tanzania, Technical Dairy Specialist for the East Africa Dairy Development in Kenya, Uganda and Rwanda and recently as Project Coordinator for the EU funded Transforming the Zimbabwe Dairy Value Chain for the future (TranZDVC). He is currently assisting dairy development in Botswana. He is reachable on:

Email: dairydoctor@yahoo.co.uk, edsonchifamba@yahoo.co.uk
Mobile: +263 774 836 438

Figure 1. Visual recognition of lameness.
Health and parasites (ectoparasites, worming, vaccinations)



After a day's toil — Kundiso stands at the edge of her tobacco seedbed

Kundiso's tobacco crop from last season

Kundiso (second from right) with part of the Zimbaseed team

When an online stimulus delivered an enterprising farmer

Obert Chifamba

MEET 22-year old Kundiso Bosha – a determined Social Work student with Ezekiel Guti University who stumbled on an intriguing farming idea online that stirred up a newfound passion inside her.

It took an advert on Facebook to whet Kundiso's appetite for farming and each time she went surfing on the internet, she would check for new such postings.

And as fate would have it, Kundiso's love for Facebook landed her on an advert inviting interested persons to join a project to produce maize under contract. A company with German origins, Zimbaseed, wanted to do trial runs of a maize variety they had developed and was planning to introduce it onto the market. The year was 2021 and Kundiso was still a student, then. "The opportunity was too tempting to ignore and determined to make the most of it, I immediately contacted my mother to assist me find a piece of land for the project. We got one from a close relative in Knowe, Norton," the soft-spoken Kundiso said recently.

The idea of doing a farming project solo was irresistible and so was the decision to take the giant leap of faith and embark on a journey of self-discovery to turn her vision into a successful and rewarding reality.

She enlisted the help of her maternal uncle to prepare the land while Zimbaseed provided her with inputs and technical extension services. They would make regular farm visits to assess progress and adherence to the proper agronomic practices.

Kundiso admits the journey she had decided to embark on was not a push-over, as she would wake up early and get a lift to be dropped off at Zvimba Road, near the Knowe area to complete the remaining distance on foot.

"The distance from Zvimba Road to our project site was long, but my determination made it look short. Each step I took was fueled by my passion for farming and my desire to make this project a success," she observed.

Kundiso confesses that this experience made her realise how much she had grown in terms of passion and commitment. It was not just about planting maize but nurturing a dream, facing challenges head-on and learning valuable lessons along the way, she noted.

> Said Kundiso: "This journey taught me to be resilient and reminded me of the importance of community support and the power of seizing opportunities."

Although the yields were not a reflection of what she had expected, as she got three 50-kilogramme bags of the cereal, she remained unfazed and even raring to venture into fresh escapades.

Meanwhile, her flirtation with Facebook was continuing and this time it landed her on another adventure. She stumbled on a site titled 'Mhuri Farming' that dealt with tobacco seedling sales.

"Intrigued, I reached out to the page administrator, only to learn that becoming a tobacco farmer required one to register with the Tobacco Industry and Marketing Board (TIMB). This was new information, and I found it quite confusing. Despite the complexity and the need for steady financing—which was a challenge since I was still unemployed—I refused to let my hopes wane.

"I decided to visit tobacco companies like Mashonaland Tobacco Company and Premium Leaf Tobacco to gather more information. However, this phase was fraught with difficulties. Security personnel often stopped me from meeting the right people, and on at least four occasions, I was denied access to those who could provide me with insights into tobacco contracts and business opportunities," she explained.

Luck eventually smiled on her one day when she managed to gain entry into Mashonaland Tobacco Company. She recalls that receptionist was very understanding and linked her up with their manager for Manicaland who proved to be incredibly helpful.

Said Kundiso: "He guided me through the process of applying for a grower's registration number with TIMB. This process took a year due to the extensive paperwork involved. When I finally received my grower's number, my joy was immeasurable," she remembers.

Incidentally, this tobacco project was to become her greatest achievement as a farmer to date. She had weathered discouraging comments about how unviable the crop was and was determined to see her journey through.

Kundiso seems to be a darling to most of her maternal uncles with another one coming in handy to provide her with a piece of land for her tobacco project in Rusape. She hired a tractor for land preparation and used allowances from her internship with Nedbank Bank to fund her operations.

She also signed a contract with Boost Africa, a tobacco contractor that provided her with the seed. Her uncle helped her establish a seedbed and helped her manually.

They would often hire casual labour but Kundiso was involved neck-deep in all the manual work required from planting, transplanting and weeding. She was to later terminate her contract with Boost Africa with assistance from TIMB.

It was not long after this drastic decision that her internship screeched to an end and her funding woes were back again. Once again she had to extend a begging bowl to her mother who did not disappoint but funded her until the project was completed.

In March, she joined other farmers trooping to the floors to sell their produce. She had managed 177 kilogrammes of the golden leaf from a hectare. The El Nino-induced drought had ruined her dream of recording a copious harvest.

"I still managed to get some decent income after selling my produce. High service costs were, however, my biggest undoing, which brought to the fore the need to advocate for their moderation for all farmers," she added.

These setbacks have, however, only bolstered her resolve to explore more farming adventures and belief in her capabilities and courage to take risks.

She is at the moment seized with preparations for her next tobacco and maize projects in Mt Darwin and Chegutu respectively this forthcoming season.

She will be doing maize on 20 hectares and tobacco on one hectare.

Kundiso is even dreaming bigger: "I wish to own a food bank one day, just like World Bank. l want to be the owner of a food reserve for use in drought relief programmes and also provide sustainable food solutions. I am working on farming for profit from this year towards saving to buy 40 hectares of land."

On the sidelines, Kundiso is still pushing to broaden her knowledge on various farming disciplines. Her Facebook hobby has also led her to a horticultural development group called Holland Greentech (HGT).

This organisation aims to develop Zimbabwean communities through horticulture and greenhouse farming.

Kundiso often attended workshops run by the organisation alongside people from neighbouring villages. She concedes that she acquired a lot of knowledge from these workshops.

Her word of advice to her peers is to never stop dreaming and wake up to take steps to make those dreams come true.

"No office is off-limits if you believe in yourself and have the right strategies. Opportunities are open to everyone, so act quickly to avoid pressure or missing out. If you cannot find an opportunity, create one. And remember, God is good all the time."

Facts on increasing farm profits

SKIP as many middlemen as practical. Sell directly to chefs and families, if you can. Wholesale is the least profitable method of sale. Farmers' markets can be profitable, or they can be worse than wholesale, in terms of your hourly rate. Be creative.

Integrate water, and trees, into your whole farm system. Build ponds in the hills. You will want a gravity-fed, pressurised water delivery system, for irrigation and watering animals. I strongly recommend forage hedgerows to divide up your pasture cells, on contour, not simply in a square grid. For this, on-contour, water-soaking swales are a wonderful tool. Without trees, you will get less rainfall, and condensation on trees can be 80 percent of precipitation. Trees help catch rainwater, and slowly release it, helping keep your irrigation ponds full. Trees also provide refuge and forage for birds, which can function as pest control and fertiliser delivery.

Replace fertilisers and pesticides with integrated biological controls, in the form of symbiotic relationships. Chemicals are a huge expense, for many farms. In crop fields, integrate productive tree belts and hedgerows. Legumes are invaluable to crop systems that involve grains. You can rotate fields to be pasture some years, and crop other years. Use purple martins to keep flies down, and collect fertiliser from a pigeon house. Chickens should directly follow herbivores, to take advantage of the shorter grass, and to clean up after the herbivores. Ruminant parasites can't survive the chicken's gut.

Limit, diminish and gradually eliminate mechanical soil disturbance. Tillage damages the soil, which is your bank account, as a temperate climate farmer. Tillage provides some short-term advantages, and long term soil bankruptcy. Thirty percent of soil organic matter is lost with each cultivation. In any given year, the crops may grow better under a tillage regime, because all the dead microorganisms providing a surplus of nutrients. But as time goes on, the population of microbes gets so low that they can't support plant growth any more, and the only plants that can survive are ones that don't rely on microbial symbiosis. These are called weeds.

Nobody should live his life on a single source of income. You should also use this theme to maximise your business. You should adopt diversified cropping system where some allied activities like bee keeping, dairy farm adopted by you along with crop production.

You can also use cow dung as raw material for vermi composting and can sell vermi compost.

In this way the profit can be maximised.

One more suggestion is you should start processing and marketing at your level of your product. For example, you can process wheat into flour and can sell it in your neighbouring cities. As you know impurity is a trouble for most of people nowadays so you can provide them 100 percent pure product processed by yourself.

You can grow vegetables on a part of your farm and can appoint a person on monthly wages to sell them in cities at good rates. The extra produce can be utilised in pickle making or something else. You can also sell pickle with your own brand. Home made products are highly appreciated by city public.

What can I do in my farm to increase my profit?

You can only do three things (like any other business):

1. Increase revenue
2. Reduce input costs
3. Sell equipment to generate a one-time increase in cash

In regards to point 1 — increase revenue. Review which crops you are growing, are these the ones that provide the best return per acre. Are you picking the right varieties of seed for your farm? Are you providing enough nutrients? Are managing weeds and pests effectively to maximise yield? Are you planting and harvesting at the right times to maximum yield (usually plant as early in the season as you can/should and harvest before you have any field loss) and so forth.

In regards to number 2 — reduce input costs. Can you cut-back on any inputs (seed, fertiliser, fuel, chemicals, etc.) without impacting yield. Can you purchase what you need to have any cheaper, use pre-pay discounts, different suppliers and many others. Can you be more efficient (variable rate planting, row-cut offs to minimise over-planting and sprayer boom controls.

In regard to number 3, which is really more a cash-flow strategy than profit really, but are there any assets which you don't need or rarely use that can be sold.

Which is more profitable, crop farming or livestock farming?

If you undertake crop farming or livestock farming as an independent activity, both of them are not profitable

But if you combine crop farming and livestock farming on the same land then it is profitable

By combing crop farming and livestock farming we create a close loop cycle

The manure and urine from livestock farming gets used in crop farming and provides natural fertiliser and saves the cost of chemical fertiliser. Soil will have more microbes and crop will grow better

Agro waste from crop farming will be used as a fodder for livestock farming and it will reduce the cost of the feed for livestock

How can agriculture be converted into a profitable business?

How can I make farming profitable?

Farming contains risks such as weather events that can be devastating to an entire year's income. Not all production systems and products have the availability of insurance. The development of an accurate budget and making sure you have contingency built in for unexpected market fluctuations, and other impacts that you have little or no control of is critical. Leasing land, equipment, and other items to reduce the amount of capital that you have at risk and limiting debt is essential. The marketing of any and all products is critical and diversification of the types of products you produce can reduce risk. Focusing on optimum rather than maximum production often increases profit or minimizes losses. The use of custom farming and harvest services can reduce costs and capital requirements. Development of a marketing plan that has capabilities of maximising your income is extremely important.

How do we create a profit from our farming source?

1. There are two ways to make a profit from farming.
2. As Earl Butz put it, "Get big, or get out!" is one way. Use a lot of leverage, get deep into debt, take every subsidy you can find, and join the race to the bottom in commodity products.
3. Or, you can make a "profit" in small farming by growing a diverse selection of food that your local market likes and that you are willing to cook and eat — and preserve for the winter.
4. Those answering here ignore the value of self-sufficiency. Remember that the food that you grow and eat is totally untaxed, whereas if you sell farm products in order to buy food, that food comes from after-tax income.
5. We have a wide range of value-added products that get us through the winter, and we produce a lot of what we eat.
6. Yea, you can fight the race to the bottom and somehow make a profit now and then. But the "profit" from being largely self-sufficient is priceless!
7. How do we create a profit from our farming source?

8. There are many ways to create a profit from farming source, they are as follows:

1. **Diversify:** Look into other crops that may be in demand and explore opportunities for diversification. Consider adding value-added products or services such as beekeeping, selling eggs, selling seedlings, selling handmade products, or offering educational farm tours.
2. **Market:** Develop a marketing plan to reach potential customers, including local restaurants, farmers' markets, and local grocery stores. Consider creating an online presence through social media platforms and e-commerce websites.
3. **Capitalise:** Explore options for financing the farm, including loans, grants, and crowdfunding. Consider applying for grants or joining agricultural cooperatives.
4. **Streamline:** Implement systems and processes to increase efficiency and reduce costs. Invest in automated machinery and equipment, and consider hiring additional help.
5. **Expand:** Explore ways to increase production, such as expanding acreage, investing in new technology, or adding greenhouses. Consider expanding into other products, such as value-added products or services.

How do we create a profit from our farming source?

There are several ways that farmers can create a profit from their farming source. Here are some examples:

1. Direct sales to consumers: One way to increase profits is to sell directly to consumers through farmers' markets, roadside stands, or a farm store. By selling directly to consumers, farmers can avoid the middlemen, and keep a larger percentage of the profit.
2. Value-added products: Farmers can also increase profits by creating value-added products from their crops or livestock, such as jams, jellies, cheeses, or cured meats. Value-added products often have a higher profit margin than raw commodities.
3. Diversification: Farmers can also increase profits by diversifying their product line or adding new revenue streams, such as agri-tourism or offering educational classes or workshops.
4. Contract farming: Some farmers may choose to enter into a contract farming agreement, where they contract with a company to grow a specific crop, and the company provides the seeds, fertilisers, and other inputs. This can provide a guaranteed market for the crop and reduce the risk for the farmer.
5. Government programmes: Government programmes, such as crop insurance or conservation programmes, can also provide financial assistance to farmers.

In addition to these strategies, it's important for farmers to have a solid business plan, manage their expenses and cash flow, and stay up-to-date with industry trends and market conditions to maximise their profits.

Extracted from the Internet