Buying breeding animals — the value of sale catalogues

1. Introduction
JULY is traditionally the month of breeding stock auction sales in this country. This year, the Zimbabwe Herd Book (ZHB) will conduct its 56th National Breed Sale on the 26th of July at the Mt Hampden Sale Pens. Numerous other sales are lined up prior and subsequent to that main sale. Most livestock producers are probably contemplating bidding for one or more breeding animals — bulls, bucks, rams, heifers, maiden ewes or does — at the sales.

The importance of selecting the ideal breeding bull, buck or ram can never be underestimated. Bulls or rams constitute three to four percent of the herd, but they contribute 50 to 90 percent to each calf or lamb’s genetics. When pregnancy from the bull or ram is used as replacements, the influence of that sire becomes even more prominent for many years to come.

Selecting the best breeding material to improve one’s herd can be a big challenge. The future of the enterprise jeopardised through aimless selection of breeding sires, particularly when the operation lacks specific breeding goals. This article explores the essential steps to take when preparing for and buying breeding stock at an auction sale.

2. Understanding sale catalogues
Selecting the right breeding animals is critical. This is because the genetic value of the breeding herd directly impacts productivity, performance, and profitability of the operation for years to come. With the right approach and proper use of available information, one can select high-quality breeding animals that will take the herd to the next level.

Because they focus on buying an animal that looks the part, farmers often rely on visual appraisal and hands-on inspection of the animals on offer. While visual appraisal of animals on sale is crucial, sale catalogues provide additional information that the buyer can use to make a more informed purchasing decision.

A livestock sale catalogue provides information on pedigree, performance, health and other records of prospective breeding animals. Information about the name, breed, age, sex and birth date of the animal, as well as breeder name and address, is provided.

Often, a three generation pedigree of the animal is included in the catalogue. The pedigree outlines the animal’s ancestry (parents, grandparents and great-grandparents), revealing its genetic background and influential bloodlines. This information allows the buyer to assess the genetic merit and potential of the animal.

A catalogue may include performance metrics related to fertility and growth. Questions such as how relatively fast the animal’s progeny will grow, how much more milk they may produce, or a bull’s or buck’s influence on calving or lambing difficulties can only be answered using performance data that a catalogue provides. Catalogues for ZHB’s National Breed Sale events often provide performance data such as the animals’ actual weights, ratios and rankings at birth, 200, 400 and 600 ± 100 days and other relevant measurements. The dam’s reproduction information includes her calving records, age at first calving and average inter-calving period. This data provides insight into the animal’s growth, efficiency, and overall productivity.

The catalogue may also provide estimated breeding values (EBVs) for a number of economic traits and their reliability. An EBV represents the animal’s genetic merit in a particular trait, half of which is passed onto its progeny. It is typically estimated from performance records of the animal itself and that of its relatives, and is compared to the average of the breed.

Strategic purchasing decisions rely on a combination of linear and functional traits of the animals as well as their performance. By carefully studying information provided in sale catalogues, one can identify and select animals that align with breeding objectives and long-term goals, and avoid potential challenges.

3. Before the sale day
There are two reasons why buyers seldom use sale catalogues. Interpretation of the catalogue is often challenging for them. Second, buyers lack sufficient time to study and interpret the catalogue during the actual sale. For these reasons, auction catalogues are often ignored.

A buyer should put the necessary groundwork to ensure that they are ready to make the best purchasing decision. The first step would be to define the herd’s breeding goal and the specific needs of the enterprise. Knowing exactly what you are looking for will help you navigate the sale lots and make strategic purchases.

Once the breeding goal has been established, it is necessary to closely review the sale catalogue well before the auction date. Getting a copy of the auction catalogue at least a few days before the sale will allow proper selection of breeding animals. This research phase allows buyers to identify prospective breeding animals that best align with their goals and flag any potential negative aspects in each animal.

The third necessary step is to count the cost. Buying breeding stock is a significant investment, so it’s essential to have a clear budget in mind and be prepared to bid competitively, but within certain budgetary limits. Breeding animals should be acquired without straining business cash flow position.

4. Evaluating animals at the sale
Animals are often available for viewing a day or two before the actual sale. A visual appraisal of each animal is crucial, considering conformation, structural soundness, overall health, vitality, docility, and adaptability. These factors can significantly impact future productivity and longevity.

During physical evaluation, the buyer has a chance to engage with the breeders and ask further questions about each animal’s history, health records, and performance. This dialogue can provide valuable insights not captured in the catalogue, including any guarantees or warranties the seller may offer.

Now that the buyer has a well-rounded view of the animals on offer, he or she can identify those that best meet his breeding objectives and arrange them in order of preference. This prioritisation will guide the bidding strategy and help him stay focused on target animals.

5. On the sale day
On the day of the sale, a strategic and disciplined approach is necessary to ensure that the right animals are acquired at the right price. Setting maximum bid prices for each of the priority lots is a good strategy to avoid getting caught up in emotional bidding wars that could lead to overspending.

During the bidding process, the buyer has to remain calm and stick to his predetermined bid prices. If the bidding exceed maximum, a buyer must be willing to walk away — there will be other opportunities to find animals that fit one’s budget and breeding program.

6. Conclusion
Acquiring the best breeding stock during an auction sale requires thorough preparation and a strategic approach for success. It is crucial for one to have defined breeding goals, review sale catalogues, evaluate animals on-site, and execute a disciplined bidding strategy. The buyer should stay focused on the right animals — those that truly fit the needs and long-term objectives of the operation. EBVs are the best measure of the genetic potential of animals for a breeding goal trait. Buyers should utilise these tools in their selection process. That way, he will be well-equipped to make data-driven decisions that position the herd for long-term success.

About the author
Eddington Gororo is a practitioner, 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 6275 or gorororoeddington@gmail.com.
OBSERVATIONS of oestrus are more difficult in the tropics due to anoestrus resulting from poor nutrition and/or intensive suckling. Furthermore, the oestrus period is shorter (10–12 hr), signs are less pronounced or mainly shown at night (especially in local cattle) when farmers are less keen on, or active in heat detection. The average duration of heat is about 14 hr in normal weather conditions. Heats can be as short as 2 hr and as long as 28 hr. Twice daily observations are then essential to catch short heats. Observations in the cool of early morning are more likely to detect heat than those in the heat of the day. The best conception rates occur following insemination 4–12 hr after the first signs of heat is observed. However, the problem is knowing at what stage of oestrus the particular heat was first detected.

Cows show signs of heat when:
- They are 18–24 days after their last heat (if they are still non-pregnant).
- They stand to be mounted.
- They attempt to mount other cows.
- They are restless and bellow.
- Their feed intake is reduced.
- They have poor milk let down.
- Stringy mucus is seen exuding from their vulva.
- Their vulva is red and swelling.

Heat detection can be improved with:
- Routine night observations.
- Interpreting cow behaviour.
- To Page 5
in the recent past. To me, this transformation has demonstrated maturity in your decision-making powers that incidentally, are the force that drives agriculture.

As we transition from winter to a fresh summer season, I want to remind you that effective decision-making takes courage. In fact, it takes what you might call 360-degree courage, something I guess I will not need to define because you already know where I am going with this. The long and short of what I am saying is that it takes a strong-willed character to make that drastic decision, which might even see production taking a dip at the beginning, as everyone acclimatises to the new reality on the farm before picking up later.

Of course, I am not suggesting that every farm must have a formal business plan, although I have trouble imagining a farm where a business plan would not be helpful unless it is that kind of farm where the plan would sit on the shelf to gather dust and never be used. The good thing about using the plan is that it braids myriad objectives together and helps ensure that the right amount of progress is made on the right objectives in the right timeframe.

One thing that you must never forget is that there are other keys to professional decision-making that include a commitment to continual learning, disciplined cost management, an understanding of risk, and a knowledge of financial capability. This is where all the talk about treating farming as a business gets its recipe for sustainability.

The astute farmer plans everything she does and keeps checking on her expenditure versus the expected earnings. This is where the presence of a plan becomes evident, as it will dictate to you what you should be doing or should not be doing. The plan will serve as director of operations and where you religiously follow it, you will not miss your target by a wide margin.

My parting shot today is that if you do not have a plan for your farm, please run around and get one drafted for you or draft one for yourself with guidance from somebody familiar with such plans, of course. Till we meet again. Enjoy!

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**Goat nutrition**

**Senzile Mhlovu**

**GOATS require nutrients for body maintenance, growth, and reproduction. The availability of forage does not always meet the nutrient requirements of the animals due to seasonal availability of feed resources, poor management, inappropriate grazing management, rangeland fires and droughts. Goats are browsers and require a mixed diet (grasses, legumes, shrubs, tree leaves, crop residues and weeds) for them to have a balanced diet. Their diet can contain 75 percent browse from trees and shrubs and 25 percent grass. They are very selective animals; therefore, they will prefer to forage on young shoots and leafy leaves. Properly and adequately fed goats grow better, produce more offspring and suffer fewer health issues. Animals receiving inadequate diets are more prone to diseases and will fail to reach their genetic potential whereas overfeeding contributes to production loss. In general, goats require energy, protein, vitamins, minerals, fiber, and water.**

**Planted pastures/fodder crops and browse species**

These are usually the primary and most economical source of nutrients. Pastures tend to be high in energy and protein when it is in a vegetative state. These can also be conserved as hay or silage. Feed resources from planted pastures include banna grass, star grass, kukuya grass, forage sorghum, lablab, velvet bean, cowpeas and sweet potato vines.

**Velvet bean bales**

Goats feed on number of wild and domestic browse species. The diet comprises of fresh soft twigs, leaves, and pods. Pods are good protein sources that can be collected and stored for supplementary feeding during dry season. Acacia species, Grewia monticola, Dichrostachys spp and Mopani are preferred rangeland browse species. Mulberry, leucaena and exotic acacia are preferred agro-forestry browse species.

**Hay**

Hay is the primary source of nutrients for goats during winter season. It is a moderate source of protein and energy for goats. Legume hays are high in protein, vitamins and minerals than grass hays. The energy and protein content of hay depend on the maturity of the forage when harvested. Proper curing and storage are necessary to maintain nutritional quality of hay.

**Crop residues**

Crop residues are also sources of feed that are consumed by goats during the dry season. These include maize stover, groundnut stover, sorghum stover, sweet potato vines and banana peelings.

**Commercial feeds**

They include goat meal and pellets which are formulated to meet animal’s nutrient requirements. Concentrate feeds include energy and protein feeds. Energy feeds include cereal grains such as maize, rice or wheat bran. Protein feeds contain high levels of protein and may be of animal or plant origin. Plant protein sources include soybean meal and cotton seed meal.

**Minerals and Vitamins**

The most important mineral salts required by goats are mainly calcium, and phosphorous. These are important for good bone and teeth development, reproduction and lactation, promoting appetite, immunity, weight gain and to improve the hair coat appearance. The ration of calcium to phosphorous should be kept at 2:1. Vitamins are also needed in small amounts. Small ruminants require vitamins A, D and E whilst vitamin K and all the B vitamins are manufactured in the rumen. Feeds provide some of the mineral requirements but where these are inadequate to meet animal’s requirements, supplementary minerals in the form of commercial mineral mixtures should be provided.

**Water**

The amount of water needed by a goat varies with breed, type of feed taken and physiological condition of animal thus pregnant or lactating. Water requirements increase substantially when environmental temperatures rise and decline with cold environmental temperatures. Inadequate water intake can cause various health problems. In addition, water and feed intake are positively correlated, meaning the more feed goat eat, the more water they need. Goats consume 4 times as much water as dry matter. For dairy goats, provide 1.5 litres of water per litre of milk produced.

Clean water should be provided at all times. An ideal water trough should be made of material that is easy to clean (cement or plastic). The depth should be about 30cm to allow even kids to drink from it and not too low to allow goats especially kids to stand in the trough and pollute the water. A space of 25cm should be allowed per goat.

**Flushing**

Flushing means increasing the level of feed offered to breeding does mostly energy feeds, starting from one month prior to introduction of the buck, to increase body weight and ovulation rate. Increasing energy levels should continue throughout the breeding season and for approximately 30 to 40 days after removing the bucks. Body condition is used to determine whether flushing will benefit breeding does. Does in relatively poor body condition respond favourably to flushing compared to does in good condition.

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To Page 5
Pregnancy and heat detection in dairy cattle

From Page 3
- Checking records for days since previous heat (for closer observation).
- Using heat detection aids in larger herds, although tail paint is a cheap effective aid for most farmers.
- Using oestrus synchronisation as a management aid.

Each month, farmers need to identify cows which have calved more than 80 days before, but have not been detected on heat, and examine them. This is important if more than 60% of the herd are in this category. Some of these cows may have had an undetected heat, whereas others may not have been on heat and can be treated as non-cycling cows. If most of these cows are in low body condition, their feeding management should be improved. Others may be suffering disorders such as cystic ovaries, infected uterus, and lameness, thus requiring veterinary attention.

Improved reproductive performance provides many benefits to farmers such as:
- Higher average milk yields each day. Cows with poor reproductive performance will spend more of their time in late lactation, when daily milk yields are lower.
- Fewer cows that have become excessively fat because they have failed to conceive.
- Less compulsory culling of cows failing to become pregnant.
- Fewer cows with long dry periods.
- Reduced insemination and semen costs.
- Heifers calving at a younger age.
- Increased number of calves produced each year, thus providing more animals for sale or as replacements for the milking herd.
- More efficient feed utilization as a result of the above benefits.
- More profits, less work and less worry.

The fertility timetable for the milking cows
The fertility cycle can be best understood by following the recommended reproductive timetable as follows:
- Calving, with minimum difficulty.
- Involution (shrinking) of uterus takes 21 days.
- Follicular development commences 14–21 days after calving, in a well-managed cow.
- Voluntary waiting period, open days or days after calving with no insemination, should not exceed 30 days.
- Cycling occurs every 18–24 days.
- First insemination should be 50–80 days post-calving.
- Pregnancy takes 282 days.
- Dry off cow 50–60 days pre-calving.
- Transition period to calving for 14–21 days.

There are six key factors which have large influences on herd reproductive performance.
- Three are non-nutritional and three are nutritional. These are:
  1. The length of the voluntary waiting period, that is the number of days delay after calving before farmers begin inseminations. This is 50–95 days in the herds with the best fertility.
  2. Heat detection. Farmers can make two types of mistakes; they can diagnose heat in cows not on heat (called a false positive) or miss a heat identification (undetected heat). Missed heats are more common. The higher the heat detection rate, the higher the submission rate. Farmers with over 80% heat detection rates had 74% 80-day submission rates.
  3. Artificial insemination (AI) practices. There are many skills in AI. Good first insemination rates were 45–48%.
  4. Body condition. Cows calving at condition scores of 3 (out of a maximum of 5) had the best fertility. Cows calving in very high condition scores may lose condition more rapidly after calving and can suffer reduced fertility.
  5. Feed intake. Better fed cows have higher fertility.
  6. Heifer live weight. The occurrence of the first oestruas in yearlings depends on live weight. So better feeding practices in early life will lead to younger age at first calving in virgin heifers. These heavier animals will also cycle earlier after calving.

Goat nutrition

From page 4
Supplementary feeding
It is carried out mainly during the dry season when feed quality and quantity are low. Supplementary feeding should give preference to does in virgin heifers. These heavier animals will have a life span that is twice that of a normal eight-year-old. Body weight will lead to younger age at first calving in virgin heifers.

Hay bales
Loss of condition in goats during dry season can be prevented by:
- Cutting grass or harvesting leaves and store to give goats during the dry season when feed is scarce.
- Crop residues are grazed or processed for winter feeding. Maize stalks can be chopped and molasses added to increase palatability.
- Other options that can be considered during drought include selling goats, particularly old and unproductive, early weaning and feed lotting.

INVITATION TO DOMESTIC COMPETITIVE BIDDING

Bids are invited from reputable, reliable, well-established companies registered with the Procurement Regulatory Authority of Zimbabwe to tender for the following:

<table>
<thead>
<tr>
<th>PROCUREMENT REFERENCE NO.</th>
<th>PROCUREMENT DESCRIPTION</th>
<th>CLOSING DAY AND TIME</th>
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<tbody>
<tr>
<td>ZMDC / DOR / 01 / 2023</td>
<td>Supply and delivery of Vehicles</td>
<td>19 July 2024 at 1000hrs</td>
</tr>
<tr>
<td>ZMDC / DOR / 02 / 2024</td>
<td>Supply and delivery of ICT tools</td>
<td>22 July 2024 at 1000hrs</td>
</tr>
<tr>
<td>ZMDC / DOR / 03 / 2024</td>
<td>Provision of Computer Services</td>
<td>23 July 2024 at 1000hrs</td>
</tr>
<tr>
<td>ZMDC / DOR / 04 / 2024</td>
<td>Supply and delivery of Petrol &amp; End Loader</td>
<td>24 July 2024 at 1000hrs</td>
</tr>
<tr>
<td>ZMDC / DOR / 05 / 2024</td>
<td>Provision of Security Services</td>
<td>25 July 2024 at 1000hrs</td>
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Tender are available on e-procurement platform: https://zimpapers.org/auction/

For further information, if required, please e-mail: tenders@zimdc.co.zw
ALTHOUGH winter may seem like a quiet time on the farm to most Zimbabwean farmers, it is the perfect season to prepare for a successful summer harvest. By taking advantage of the off-season, farmers can ensure that their crops get the best possible start when the warmer weather arrives. Here are some essential preparations that can be done during winter to gear up for the summer farming season:

1. Soil Testing and Amendment
   Soil Testing:
   Winter is an ideal time to conduct comprehensive soil tests to determine the nutrient composition and pH levels of your fields. Knowing the current state of your soil allows you to address deficiencies and imbalances well before planting season.

   Amendments:
   Based on soil test results, you can apply necessary amendments such as lime to correct pH levels, or organic matter like compost and manure to enhance soil fertility. Proper soil health is crucial for optimal crop growth and yield.

2. Land Preparation
   Clearing and Tilling:
   Use the winter months to clear debris, rocks, and weeds from your fields. Tilling the soil helps break up compacted layers, improving aeration and water infiltration. This also makes it easier to incorporate soil amendments uniformly.

   Cover Crops:
   Planting cover crops in winter can prevent soil erosion, improve soil structure, and add organic matter. Leguminous cover crops, like clover or vetch, can also fix nitrogen, enriching the soil for the upcoming planting season.

3. Crop Planning
   Rotation and Diversification:
   Plan your crop rotation to prevent pest and disease buildup and maintain soil health. Consider diversifying your crop selection to reduce risk and increase market opportunities. Decide on the varieties and quantities of each crop you intend to grow.

   Seed Selection:
   Research and purchase high-quality seeds that are suited to your climate and soil conditions. Early procurement ensures you have the best options available and avoids potential shortages during peak planting season.

4. Nursery Seedling Bookings
   Nursery Arrangements:
   If you plan to use transplants for crops like tomatoes, peppers, or cabbages, book your seedlings with local nurseries during winter. Early bookings guarantee that you’ll have healthy seedlings ready for transplanting when the time comes.

   On-Farm Nurseries:
   Consider starting your own seedlings in a controlled environment. Setting up an on-farm nursery can give you more control over plant health and timing, ensuring that your transplants are strong and ready for the field.

5. Irrigation Planning
   System Inspection:
   Inspect and maintain your irrigation systems during winter. Check for leaks, clean filters, and ensure that all components are in good working order.

   Water Management:
   Plan your water management strategy for the summer season. Ensure that you have a reliable water source and consider implementing water-efficient irrigation methods, such as drip irrigation, to conserve water and reduce costs.

6. Pest and Disease Management
   Preventive Measures:
   Develop an integrated pest management (IPM) plan that includes crop rotation, resistant varieties, and biological control methods. Implementing preventive measures during winter can reduce the likelihood of pest and disease outbreaks in summer.

   Equipment Maintenance:
   Ensure that all your farming equipment, including sprayers and applicators, is in good condition. Properly calibrated and maintained equipment is essential for effective pest and disease control.

7. Infrastructure and Logistics
   Storage and Facilities:
   Prepare your storage facilities for the upcoming harvest. Clean and repair grain bins, silos, and other storage structures to ensure they are ready to handle the new crops.

   Transportation:
   Plan your logistics for transporting inputs and harvested produce. Ensure that you have reliable transportation options and consider scheduling maintenance for your vehicles during the winter downtime.

8. Training and Education
   Skill Development:
   Use the winter months to enhance your farming knowledge and skills. Attend workshops, seminars, or online courses on topics such as sustainable farming practices, pest management, and crop diversification.

9. Financial Planning and Budgeting
   Cost Analysis:
   Evaluate the costs associated with the upcoming planting season, including seeds, fertilisers, equipment maintenance, and labour. Prepare a detailed budget to manage your expenses effectively.

10. Community Engagement and Networking
    Local Partnerships:
    Engage with local agricultural extension services, cooperatives, and other farmers to share knowledge, resources, and best practices. Networking can provide valuable support and collaboration opportunities.

11. Technology and Innovation
   Precision Farming Tools:
   Explore the use of precision farming tools and technologies, such as GPS-guided equipment, soil moisture sensors, and drone monitoring. These innovations can enhance efficiency and productivity.

Data Management:
Implement data management systems to track soil health, crop performance, and other critical metrics. Analysing this data can inform better decision-making throughout the growing season. Zimbabwean farmers need to adopt technology in managing farm records and information.

12. Environmental and Sustainability Practices
    Sustainable Farming:
    Adopt sustainable farming practices that conserve resources and protect the environment. Techniques such as conservation tillage, crop cover, and organic farming contribute to long-term soil health and ecosystem stability.

Climate Adaptation:
Consider the potential impacts of climate change on your farming operations. Implement strategies to mitigate risks, such as diversifying crops and improving water management. This past season, farmers were hit hard by El Niño and planning ahead may help reduce impact.

Conclusion:
Winter is not a time for rest on the farm; it is a crucial period for preparation and planning. By taking these proactive steps, farmers can set the stage for a productive and profitable summer growing season.

Soil testing, land preparation, crop planning, nursery arrangements, irrigation planning, pest management, infrastructure maintenance, and skill development are all essential activities that can be undertaken during the winter months. Proper preparation ensures that when the warmth of summer arrives, your crops will thrive and yield a bountiful harvest.

Kundai Zvaraya is an Agronomist and founder of Farm Makeover Company +263 78 647 2644
Markets for agricultural products

THE proliferation and survival of any farming venture hinges on the availability and accessibility of viable markets. In modern farming, the farmer must appreciate the needs of the market by addressing the following issues: what to produce, when to produce and in what quantities and quality? In the same vein, farmers must gather knowledge on market trends by engaging with agricultural market experts and traders. 

The Agricultural Marketing Authority (AMA) encourages farmers to do market-led production. According to FAO, farmers incur serious post-harvest losses of over three percent of their production. This means farmers are losing a lot of their income through post-harvest losses, which is why AMA encourages market-led production to minimise these losses. Below are some of the buyers and contractors for agricultural products registered with the Authority and a list of the products they require.

Table 1: Local Buyers of Horticultural Products

<table>
<thead>
<tr>
<th>Company</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sunlic International Pvt Ltd</td>
<td>Horticultural products-cabbage, tomatoes, broccoli, mushroom, beans, cucumber and many more. Contact: Norman Chawoma +263882900704</td>
</tr>
<tr>
<td>2. Food lovers Pvt Ltd</td>
<td>Horticultural products-cabbage, tomatoes, broccoli, mushroom, beans, cucumber and many more. Contact: Godwin +26377464609</td>
</tr>
</tbody>
</table>

Table 2: Local exporters/aggregators/contractors of Horticultural products

<table>
<thead>
<tr>
<th>Company</th>
<th>Products</th>
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</thead>
<tbody>
<tr>
<td>1. Kuminda Pvt Ltd</td>
<td>Export products-passion fruit, sugar snap, mange tout peas, blue berries and many more. Contact: Clarence Mware +26377429951</td>
</tr>
<tr>
<td>2. Procitru Investments Pvt Ltd</td>
<td>Export products-passion fruit, sugar snap, mange tout peas, chillies, blue berries and many more. Contact: Tatenda Mukazi +26377429951</td>
</tr>
</tbody>
</table>

Table 3: Local buyers of livestock

<table>
<thead>
<tr>
<th>Company</th>
<th>Products</th>
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</thead>
<tbody>
<tr>
<td>1. MC Meats Pvt Ltd</td>
<td>Livestock-beef, goats, sheep. Contact: Safari +263772223249</td>
</tr>
<tr>
<td>2. Koala Pvt Ltd</td>
<td>Livestock-beef, pork, poultry. Contact: L.Murita +263772957810</td>
</tr>
</tbody>
</table>

Table 4: Grains & Oilseeds Buyers

<table>
<thead>
<tr>
<th>Company</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Acefield Pvt Ltd</td>
<td>Grains-sugar beans, groundnuts &amp; maize. Contact: Scott +263772956010</td>
</tr>
<tr>
<td>2. Nutrie Foods Pvt Ltd</td>
<td>Grains-sugar beans &amp; groundnuts. Contact: N. Ndlovu +26377290907</td>
</tr>
</tbody>
</table>

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The global sweet potato export market

Introduction

SWEET potatoes are one of the many crops that can thrive well under the Zimba

babwe climate and soils. The global sweet potato market continues to grow as the crop continues to gain traction particularly on the European market. The growing import and local production are fostering the mainstream consumption and product development.

According to Centre for the Promotion of Imports from developing countries (CBI) consumption is mainly developed in the United Kingdom (UK). The Netherlands is primarily positioned as a trade hub for northern European growth markets such as Germany and France.

Sweet potato description

Sweet potato (Ipomoea batatas L) is a root vegetable and is usually confused by the Irish potatoes (Solanum tuberosum L). There are several types of sweet potatoes classified according to the different-coloured skin and fleshed such as orange skin with orange flesh, red skin with orange flesh among others. Sweet potatoes are rich in dietary fibre, complex carbohydrates and beta carotene as well as micronutrients that include vitamin B5 and B6. The leaves are edible and can be cooked as a delicacy like leafy vegetables. Sweet potatoes take 80-100 days to maturity and are drought tolerant making it a suitable crop in drought prone regions. The crop can yield up to more than 40 tonnes per hectare under irrigation.

Preferred Varieties

The preferred varieties are the orange fleshed varieties such as Covington, Beauregard, Ellenville, Evangeline, Orlean among others. The varieties are patented except for Beauregard which is now an open variety. The patented varieties are only grown under special arrangements with the plant breeders or licensed nurseries. Royalties are paid to the plant breeders as part of the international plant breeders rights.

Postharvest management

In order to maintain good quality and a longer shelf life, producers must cure their sweet potatoes. Curing sweet potatoes is a common practice for long distance suppliers such as the United States of America (USA) and South Africa (SA). Curing is usually done up to a week at a temperature of 28-30 °C at a relative humidity of 95-99 percent. The curing process sets the skin and heals the wounds and also turns the starch into sugars. Storage after curing is done at 12-14 °C.

Market trends

The European market for sweet potatoes has increased significantly in the past years and will continue to grow in the long term. There is strong demand for imported sweet potatoes, which is why Europe is an interesting export market for foreign supplies. The main export markets for sweet potatoes are UK, Germany, France and Belgium. The Netherlands is the main point of entry to other European markets. Statistics show that in 2021 the values for imported sweet potatoes to the main European importers were as follows: Netherlands (£1.47 million), UK (£1.06 million), Germany (£5.11 million), France (£4.8 million), Belgium (£3.5 million), Spain (£5.3 million).

The UK is the biggest consumer market in Europe for sweet potatoes. It has a well-developed processing industry and a taste for new products and cuisines. In 2021, a total of 139 000 tonnes were imported. The United States and Egypt remain the biggest non-European suppliers of sweet potatoes. South Africa is also gaining a market share with a volume of 6 000 tonnes in 2021.

Export market prices

According to trade statistics sweet potato import prices between 2017 and 2021 were between €0.65 and €0.85 per kilogramme (kg). In short supply prices can go over €1 per kg. The German import price in 2019 for sweet potatoes was US$1.43 per kg.

Packaging requirements

The packaging requirements for sweet potatoes varies from open-top boxes, boxes with flaps or telescopic boxes with lid. All packaging boxes require high quality cardboard. The common packaging includes 65x18 kg open top carton for example 40 by 30 cm (6 kg) or 60 by 40 cm (18 kg); 8 kg telescopic boxes and 10 kg box with flap.

Mandatory requirements

Producers must avoid or minimize pesticide residues and contaminants. Pesticide residues are one of the crucial issues for fruit and vegetables suppliers. The European Union (EU) has set maximum residue levels (MRLs) for pesticides in and on food products. Fresh sweet potatoes containing more pesticides than allowed will be withdrawn from the market. The same applies to contaminants such as heavy metals. Retailers in Germany, the Netherlands and Austria, use MRLs that are stricter than the MRLs laid down in the European legislation.

Producers must also follow phytosanitary requirements and each consignment of exported sweet potatoes must accompany it with a phytosanitary certificate guaranteeing that they are properly inspected, free from quarantine insects-pests and diseases and in line with the plant health requirements of the EU or country of destination. In Zimba, the Plant Quarantine Services Institute (PQRI) is the National Plant Protection Organization that issues phytosanitary certificates.

Certification and sustainability

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

Organic certification is another way to set your product apart and market it at a higher price. Organic sweet potatoes must comply with the EU organic regulations. The new Regulation (EU) 2018/484 has been in force since January 2022.

Trade agreements

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

Why export sweet potatoes

Sweet potato exports bring in the required foreign currency that helps boost farmer’s livelihoods and the country’s economy at large. The crop has a lower initial capital investment compared to other crops such as blueberries, avocados, citrus, among others. Sweet potatoes give a high return to investment (ROI) over a short space of time (usually 3 months). Furthermore, sweet potatoes have lesser cold chain requirement compared to blueberries, avocados and citrus.

In conclusion, sweet potato producers in Zimbabwe can take advantage of the trade agreements and global demand for sweet potatoes. It is important to comply with regulatory and private standards such as GLOBALG.A.P. is important for producers and processors to access these markets.

Bolon Kudzai Kakava is a Regulations and Compliance Consultant.
Prepare for La Nina weather events

Malcolm Cock

WHEN you are running a small farm, you need to be prepared for increasingly regular severe weather events due to the La Nina and El Nino weather patterns.

Severe weather events such as floods and storms (during La Nina years) and drought and bush fires (during El Nino years) are risks that have become a certainty in Southern Africa in recent times. Zimbabwe is among the countries that are usually affected and are at risk each time there is either El Nino or La Nina weather.

While we don’t know exactly when and where these events will take place, what we can do is be prepared and manage the impacts on our farm. No matter if you’re a new hobby farmer or manage an established lifestyle farm — managing these risks is crucial.

La Nina risks and certainties

Climate forecasting has given us more accurate forecasts of La Nina and El Nino events (which we used to call floods and droughts, or too wet and too dry).

For owners or managers of lifestyle farms, the timing of La Nina events can range from annoying to absolutely devastating. Severe storms and floods can happen just before harvest or planting, or when lambing, for example.

As small farm managers, we work with nature all the time, so it is a good idea to take heed of expert advice relating to La Nina events, for example from the weather bureau (BoM), Departments of Agriculture and consultants in Australia and the Meteorological Services Department (MSD) in Zimbabwe.

The key to best manage severe weather events is to have your risk management plan in place well before the next event, for it is a certainty; there is always going to be another one!

With weather projections indicating that Zimbabwe will be going into a La Nina weather straight out of the current El Nino, it is important for farmers to be conversant with the management of the amount, severity and timing of rain/water inundation, and the effects on their lives, their livestock, property environment, infrastructure and business.

These events are not just floods, they also include storm damage to vegetation (wind, hail and many others) and slope runoff (flash flooding) causing damage — such as erosion, dams bursting and landslips — affecting buildings, fences, roads, access tracks and more.

Managing La Nina risks on your small farm

Management steps a small landholder can take to limit the impact of La Nina include:

1. Develop a Risk Management Plan including climate and La Nina events.
2. Prepare or develop your property in line with your up-to-date Risk Management Plan.
3. Stay up to date with climate and weather forecasts.
4. Be proactive. It’s better to be safe than sorry!
5. Check that your farm insurance and other insurances are up to date and understand which weather events you are covered for.
6. Have an up-to-date and detailed inventory and valuation of everything that is insured, and keep it in a safe and accessible place.

Practical actions to prepare your farm for La Nina events

Here are some examples of specific actions you might take to prepare your small farm for La Nina weather events.

Long term:
1. Have infrastructure built or modified for La Nina events:
   a. Well-designed fences and flood gates.
   b. Electric fence cut-out switches.
   c. Contour bank system (Keyline) development to limit erosion.
   d. Well-designed stock containment area(s).
   e. Access roads/tracks that are well formed and drained.
   f. Water (creek) crossings that are well designed and made with depth indicators.
   g. Removal of large trees that could fall on buildings.
2. Clean out infrastructure guttering and if replacing, install higher capacity drainage.
3. Build up the humus in your soil to limit erosion and runoff.
4. Always keep good ground cover to limit erosion.
5. Do not plough or disturb soil surface if possible.
6. Create well-placed and well-constructed levy banks around valuable infrastructure if in a flood plain.

Short term:
1. Be safe, be well planned, make good decisions, take good actions.
2. Do not drive through flood waters as floods can change the condition of the surface underneath considerably!
3. Have the emergency rescue services, police and neighbours on speed dial on charged mobile phones.
4. Ensure all people involved know the plan and their responsibilities.
5. If it’s not safe to stay, everyone should leave before the event starts.
6. Move stock to high ground, with feed and water.
7. Remove your most important valuables to a safe place.
8. Check that your insurances are up to date and accessible.
9. Have sufficient stored feed and water in dry area(s) for family and stock.
10. Have access to a well-serviced and fuelled generator/inverter

Post event:
1. Look after yourself and others – physical and emotional well-being is paramount.
2. Check on stock health and keep animals in a relatively warm, dry place with feed and water.
3. Contact relatives and friends to let them know how you are and ask for help if needed.
4. Take a detailed survey of damage as soon as possible and document that with photos.
5. Contact your farm and general insurance agents — have their numbers on speed dial.

Recovery from a severe weather event will take time, effort and money and is an emotional time, so remember to look after yourself and others and don’t hesitate to ask for help.

The author is a Principal Consultant at Farm Dynamics Consulting, grew up on a dairy and beef farm in the Yarra Valley, Victoria in Australia. He has been working with small farm landholders for over 30 years to achieve their goals and has a vast amount of practical and theoretical farming experience.
When an aborted diplomatic dream gave birth to a horticultural exploration

Edgar Vhera
Agriculture Specialist Writer

FROM an aspiring diplomat to a dedicated consultant on horticultural production and export matters

“This aptly sums up the unexpected twists and turns in Clarence Mwale’s life, as he embraced a newfound passion and purpose in serving agriculture and nurturing communities through hands-on support and expertise.

Growing up, Clarence would divide his time between staying in Zengeza in the town of Chitungwiza or Glendale in Mashonaland Central province. He went to Allan Wilson High School in Harare before proceeding to study International Relations and Diplomacy at the University of South Africa.

“I wanted to be a diplomat as I was good at public speaking. During my high school days, I was the junior mayor for Chitungwiza municipality and went on to become a member of the child parliament. I was very active in public speaking and debating. I was also in the interclub," Clarence told this news crew recently. He never imagined his taking the course it has since taken, which has now seen him dreaming to facilitate the integration of at least 5,000 smallholder horticulture farmers into the global horticultural exports arena.

But Clarence’s life was just full of surprises.

“My first job involved carrying baskets for customers at Ekbank Farm in Harare while I was studying. I then went to Selby Enterprises, still in Harare, to look for something better. One of the owners, Mrs Linda Selby requested me to do certification for their export markets. I started doing Euro Gap certification for their out growers throughout the country before it was named Global Gap," he observed.

It was during his stint at Selby that he rose through the ranks from being a compliance officer to a compliance manager.

Mr Mwale confesses to noticing that there was a big need for certification as a lot of other companies were contacting him for his certification services, which was the beginning of the turning point of life.

“I approached the owners of the company and proposed to start a company to provide certification services but they were obviously not keen. I left my job in 2007 and started my own company called Fair Mark,” continued Mr Mwale.

Exploring new territories is not always rosy. Clarence’s venture hit turbulent times, as he failed to get clients. He was to pack his bags again and head to Kenya where he worked until 2008.

“I came back in 2009 to encounter the toughest and darkest time in my life. I made contacts with wrong friends and ended up being arrested for an offense I never committed,” he said sorrowfully.

After gaining his freedom, it took one Shawn Philp, then managing director for Forrester Estates in Mvurwi, to encourage him continue pursuing the certification work. Because of his influence and word of mouth, other farmers started engaging Mr Mwale.

In 2012 Mr Mwale registered his company and went back to Selby again as a consultant.

“I did this to repay them back for the good they had done to me, because if it was not for them, I would not be where I am today. I proposed to do internal audits, trainings, development and any other work for free but Adam Selby offered me 50 percent pay," he explained.

Clarence’s company, Fair Mark, continued to grow — conducting about 300 audits in a year and spreading to five other countries – Zambia, South Africa, Mozambique, Kenya and Rwanda.

“I became a successful consultant and became one of the very first people in Southern Africa to be registered as a Global good agronomic practices (GAP) farmer surer. All this came on the backdrop of my success with audits, he marvelled.

Incorporation of small-scale farmers

During his auditing services, Clarence met small-scale farmers who did not have markets to sell their produce. To assist them, he spoke to Selby Enterprise or flower exporting company, Zanflex that, once in a while, would absorb their produce but still the farmers could not find value chains they could supply.

“So, around 2014, I wrote a business plan called Tuminda and tried to register it with different partners but to no avail. I continued my work with Fair Mark.”

In 2021, I met some church elders with whom I share the same faith and we registered Tuminda, but we did not have an aggregation centre," he disclosed.

After one year of trying, Tuminda failed to put together resources for a packhouse and aggregation centre resulting in the relationship becoming very complicated. Around end of March this year, Tuminda collapsed.

The birth of Kuminda

At the beginning of this year, Clarence left Tuminda to form Kuminda Enterprises with his business partner in the diaspora, Mr Fred Matenga whom he had been speaking to since 2012.

“My business partner came in with money and I came in with the experience and contacts to make a perfect fit. He owns 60 percent and I own 40 percent of the business. We also co-opted Fair Mark into the same arrangement. I own 60 percent and he has the remaining 40 percent shares,” he explained.

To enrol more small-scale farmers into production, a new group of companies for Kuminda and Fair Mark called Veg Fresh was formed and registered in the United Kingdom (UK).

“We run these businesses together but without Matenga this would not have been possible because he provided the money, which had been the missing link. "Kuminda has now converted a warehouse building into a model world class pack house, complete with cold storage facilities. We also bought a refrigerated vehicle and some trucks” he said proudly.

Kuminda is a multinational company founded in Zimbabwe and jointly owned by Messrs Clarence Mwale and Fred Matenga. Its main goal is to empower African farmers by providing them with access to international markets. Kuminda is also sending mangoes, sugar snap and garden peas, fine beans and chillies to UK markets every Monday, Wednesday and Friday.

Employment creation

Kuminda now has 50 permanent workers from Hatcliffe and areas around the University of Zimbabwe (UZ) farm, with women constituting 47 percent. The company pays agro-industrial National Employment Council (NEC) rates, which are higher than for general agriculture.

Small-scale farmers

Kuminda currently has over 2,000 small-scale farmers most of whom are working with non-governmental organisations (NGOs) or organised groups. By 2023 they are targeting 5,000 small-scale farmers who will be growing summer and winter crops and providing employment throughout the year.

Certification of farmers

Farmers are expected to pay US$150 for Global GAP certification services, an amount that most smallholder farmers do not have. Kuminda is paying this whole amount before deducting it later when farmers supply their produce for sale.

Blueberry farming for smallholder farmers

Kuminda has since secured exclusive rights to promote the production a blueberry variety developed by a Dutch breeder, Fruit Vision, which will be grown by smallholder farmers in cooperatives or individuals who have at least 10 hectares, irrigation and access to finance. “We will make use of the Spain model in which blueberries are produced by cooperatives and put the first 20 hectares of this new variety at our farm in Marondera,” added Clarence.
Production of Oyster mushrooms

The mushroom house

It is also called the Fruiting or Growing house

Construction of the mushroom house is based on a simple basic design.
1. The dimensions depend on the number of substrate bags the grower can handle at any one time.
2. The walls are constructed out of farm bricks or poles and dagg or a wooden frame and thatch. Plastic or foam sheets may be used to line the walls in order to increase the relative humidity in the production house.
3. A roof thatched with grass or banana leaves.
4. Air vents and windows on the upper side of walls are required for ventilation and lighting to initiate fruiting. Light sufficient to read a newspaper when in the house is adequate.
5. Wooden shelves for holding the bags or wooden racks for handing spawned substrate bags

The mushroom house should provide optimum conditions for fruiting.

Temperatures should be maintained at 18 – 25 Degree Celsius and relative humidity should be 80 – 90 percent.

Incubation/Spawning Room

• Spawned substrate bags are kept in this room for the mushroom mycelium to grow. Growers may construct a separate incubation room with shelves to hold the bags.
• Alternatively, the spawned bags can be covered with a black plastic in the mushroom house.
• If using the mushroom house for incubation the air vents and the windows should be closed to provide dark conditions required for spawning.
• Light is not required in the incubation room. Temperatures should be about 24 Degrees Celsius

Mushroom Spawn

• Spawn referred to, as the mushroom seed is mushroom mycelium growing on sorghum, wheat or barley. It is used to seed substrate.
• High quality spawn should be obtained from reputable Spawn Laboratories
• Good spawn is the key to successful mushroom production. Pleurotus ostreatus and Pleurotus sajor caju are the strains available locally for Oyster Mushroom production.

Substrates

• Substrate is the agricultural waste on which the mushroom grows. Oyster mushroom can be grown on several agricultural wastes
• Finely chopped rice or wheat straw
• Shredded maize cobs
• Cotton waste
• Finely chopped maize stalks
• Sawdust from broad leaved trees
• Banana leaves
• The type to use depends on availability and accessibility
• Any of these substrates may be supplemented with rice or wheat bran at 15 – 20 percent and lime at one to two percent.

A good substrate has the following properties:
• Easy availability
• High nutrient content for the mushroom to grow
• Good aeration — not too compact and not too loose
• Good water holding capacity — not too dry and not too wet
• Wheat and rice straw are the most commonly used substrates in Oyster mushroom production.

Steriliser

• The steriliser is required for pasteurising the substrate to eliminate pests and diseases.
• The steriliser can be a huge pot, container or metal drum to hold large quantities of substrate for boiling in water at 100 Degrees Celsius.
• Firewood or other local materials are used to provide fire for heating the steriliser.

Other requirements

Thermometer — used to check temperatures
Humidity Hygrometer — used for monitoring relative humidity
Sprayer — for watering the mushroom

Incubation

Substrate Preparation and Pasteurisation

1. Substrate preparation and pasteurisation
2. Spawning
3. Incubation
4. Fruiting and Harvesting

Substrate Preparation and Pasteurisation

Pasteurisation aims at killing pests and diseases that can spoil development of the mushroom. Immersion in boiling water is a cheap but efficient way of pasteurising the substrate.

Production

Oyster mushroom production has four major steps.
1. Substrate preparation and pasteurisation
2. Spawning
3. Incubation
4. Fruiting and Harvesting

Substrate Preparation and Pasteurisation

Pasteurisation aims at killing pests and diseases that can spoil development of the mushroom. Immersion in boiling water is a cheap but efficient way of pasteurising the substrate.

1. Prepare the substrate by chopping and shredding into small pieces.
2. Soak the substrate in water overnight.
3. Drain off the water and add the supplements
4. Pack the substrate into a steriliser and fill with water — hot water is the best
5. Heat and pasteurise by boiling for one hour.
6. Transfer the substrate onto a clean plastic sheet and cool to about 40 Degrees Celsius just at the stage when you can hold it but not get burnt.
7. Pack the substrate into plastic bags taking care not to pack too tightly or too loosely.
8. Add the spawn whilst packing the substrate.

Spawning

This is the process of planting the mushroom.

1. Use about 0,5 kilograms or 300 millilitres of spawn to plant 100 kilograms of substrate.
2. Distribute the spawn evenly in alternating layers with the pasteurised substrate.
3. Tie the mouth of the bag soon after spawning
• Substrate spawning is the most delicate step of the process to ensure development of good mushrooms. Mushrooms will form through the spawn itself and the substrate too.
• Workers must operate under strict hygienic conditions.

Incubation

During incubation the mushroom mycelium grows to cover the whole substrate.

1. Place spawned bags at 24 Degrees Celsius in the dark incubation room or cover the bags with black plastic in the mushroom house.
2. Bags are ready for mushroom formation when the substrate appears white.
3. Full colonisation occurs in about 14 – 40 days.
4. Transfer bags to the mushroom house or expose the bags by removing the black plastic.

Problems in Mushroom Growing

• Poor yields
• Pests and diseases that is fungi, bacteria, insects and snails

The best remedy is to prevent these problems by taking precautions in every stage of production.

1. Obtain high quality spawn from reputable sources
2. Observe strict hygienic practices especially at substrate preparation and spawning.
3. Pasteurise the substrate well
4. Sterilise all working instruments and equipment. Jik can be used for this purpose.
5. Keep doors and window closed or use a wire mesh for covering all openings to prevent insect from entering the mushroom house.
6. Keep the floors clean all the time.
7. Do not touch any suspicious material during harvesting.
8. Throw used substrate a long distance away from the mushroom house.

Harvesting

Oyster mushrooms are harvested by gently twisting the stalk and pulling out.

1. Harvest from the opened ends first
2. Make more long cuts or holes on the central portion of the bag so that more mushrooms develop
3. Continue harvesting as long as the substrate appears white.
4. The bags can be removed from the house when the substrate becomes colourless and soft to touch.
5. A total weight of 10 to 20 kilograms of mushrooms can be harvested from 10 kilograms of dry substrate.
6. The mushrooms will remain fresh for three to six days when kept in the refrigerator or a cool area. They can also be dried using local methods of sun drying.
The itsy bitsy spider can make a big impact in agriculture

Rachel Cramer

A NEW study explores how conservation agriculture in southern Africa supports spider populations and diversity in fields, which could help mitigate pest damage and potentially lead to higher yields for farmers.

According to the Food and Agriculture Organisation of the United Nations (FAO), herbivorous insects such as aphids, caterpillars and weevils destroy about one fifth of the world's total crop production each year. Spiders can help keep voracious pests in check, but conventional farming practices (for example, tilling, crop residue removal and monoculture) can harm or drastically reduce these beneficial bio-control agents.

There are more than 45 000 identified spider species around the world. From glaciers to tropical rainforests, they inhabit every terrestrial ecosystem on earth. Some can even live in tidal zones, and at least one species inhabits fresh water.

While we tend to associate spiders with webs, only about 50 percent of the species catch their prey this way; the rest hunt on plants, on the ground or below it, using a variety of tactics such as stalking, stabbing, crushing — even seduction.

Although spiders have been around for 300 million years, some species are at risk of extinction due to habitat loss and fragmentation. Drastic reductions in vegetation — whether from a new parking lot or a tilled field — removes the food source that attracts their prey.

Bare ground exposes their nesting sites and themselves, which makes it harder to hunt and easier to be hunted by birds and small mammals.

At the Chinhoyi University of Technology experimental farm in Zimbabwe, a team of researchers aimed to determine the response of spiders under different agricultural practices. Conventional farmers often prepare their fields for planting by physically breaking up and inverting the top 6-10 inches of soil. This practice of ploughing prepares a fine soil tilth, which makes it easier to plant; it breaks up and buries weeds, and reduces soil compaction to aerate the soil. But tilling also increases topsoil erosion from wind and water. It accelerates soil carbon decomposition, reduces soil water infiltration and disrupts microorganisms living in the soil, including beneficial insects and spiders.

The researchers conducted two experiments over the 2013/2014 and 2014/2015 cropping seasons to see how tilling, crop residue retention (for example, leaving stalks and post-harvest organic matter in the field), fertiliser application and weed management affected ground — and plant-wandering spider species. They hypothesised that spider abundance and diversity would increase with lower levels of soil disturbance and more plant cover.

The results showed direct seeding into no-till soil increased the abundance of spiders and the diversity of species. Mulching also showed a positive effect.

Contrary to their hypotheses and results from temperate regions, the application of fertiliser and intense weeding did not affect the spider community.

The researchers attributed this to the difference in climatic conditions (tropical vs. temperate) of this study in southern Africa. "Often the government’s and farmer’s immediate reaction to a crop pest issue is to apply a pesticide, but we can make use of biological control agents, which may be cheaper and less damaging for the environment," says Christian Thierfelder, a co-author of the study. Thierfelder is a cropping systems agronomist and conservation agriculture specialist with the International Maize and Wheat Improvement Centre (CIMMYT) with long-term experience in sustainable intensification.

"Spiders, ants and beetles all do a really good job with little or no cost to the farmer. For us, it’s quite fascinating to see simple agronomic practices to affect and control crop pests. This also provides new avenues of dealing with the fall armyworm, an invasive species which has devastated crops across the majority of sub-Saharan Africa countries," he says.
Apiculture

- Apiculture means beekeeping for the benefit of mankind.
- The honeybee subspecies found in Zimbabwe is Apis mellifera scutellata, which is kept for its large quantities of honey.
- Stingless bees also occur but they produce small quantities of honey.

The benefits of beekeeping are:
- Honey production
- Income generation
- Medicinal purposes
- Beeswax
- Pollination of crops
- Propolis
- Employment creation
- Rural afforestation and woodland management programmes

Honeybee colony
A honeybee colony is the whole family of bees with combs and brood living in a hive or natural nest.

Queen
- This is the mother of all the honeybees in a colony and can live for 3 – 5 years.
- She has a curved sting that she uses against other queens.
- Her abdomen extends beyond the tips of her wings. The younger the queen the more eggs she should lay. A good queen lays about 2000 eggs/day during the busiest time of the year.
- The queen emerges from a peanut shaped queen cell.
- She maintains harmony in a bee nest or beehive by releasing pheromones that suppress the development of ovaries in worker bees.

Worker bees
- Found in large numbers of up to 80,000 – 100,000.
- Smallest of the three bee castes.
- They are females but they do not lay eggs in the presence of the queen.
- They emerge from worker cells.
- They defend the nest or hive from intruders.
- They collect nectar and pollen.
- They feed the brood and the queen with protein rich food.
- Life span is 4 – 6 weeks during the busiest time of the year.
- They have barbed straight stings.
- Worker bees have long tongues (proboscis) for collecting deep seated nectar.

Drones
- Their only known function is to mate with young queen bees.
- Mating occurs in the air and immediately after mating they die.
- In winter when food is scarce they are driven out of the bee nest by the worker bees.
- Drones have no stings and therefore cannot defend themselves.

Traditional beekeeping with the use of bark or log hives

Advantages
- More beeswax obtainable.
- Honeybees can be easily handled.
- Top cover needs replacement very often.

Disadvantages
- Combs can easily break if not properly handled.
- Brood and honey can be mixed.
- Can be made of locally available material such as reeds or straw.

Frame Hives
The most commonly used frame hive is the Langstroth Frame Hive.

Site selection
- Vegetation cover should provide forage for the honeybees, shade for the beehives and protection from prevailing winds.
- There must be a consistent water supply in or close to the apiary for cooling the hive and for dilution purposes.
- The site should have minimal danger from veld fires.
- Easy accessibility to the site in all weather by the beekeeper.
- Free from disturbance by animals.
- A place where honeybees do not become a nuisance to the public.
- Avoid frost pockets such as veils to avoid chilling of brood in winter.

Setting beehives

Materials required for setting beehives:
- Propolis for attracting.

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  • Bee Recking for top bar hives
  • Wax foundation sheets or strips for honeybees to draw out combs
  • Top bars for placing on top of the beehives
  • Frames for the brood or super combers
  • Small tin for melting wax
  • Guiding plank for straightening the wax lines on the top bars
  • Bucket of cold water for dipping the guiding plank and holding excess wax
  • Firewood for making fire required to melt propolis and beeswax.
  • Setting Top Bar and Frame Hives
  • The following steps should be taken when setting both Greek and Kenya Top Bar hives:
    - Prepare a small fire
    - Melt propolis in a container
    - Smear melted propolis on the hive entrance and the inside of the hive walls
    - Draw a centre line along the entire length of at least eight top bars on a Kenya Top Bar Hive
    - Top Bar Hive and about four top bars on a Greek Basket Top Bar Hive.
    - Melt beeswax in container but do not overheat.
    - Submerge the guiding plank in water and hold it against the centre line on the dry top bar.
    - Tilt them with the lower end pointing into the bucket with cold water.
    - Pour melted wax so that it flows following the centre line marked on the dry top bar to form a wax ridge and let the wax lining to cool down.
    - Remove the guiding plank and scrap off about 2 cm lengths from both ends of the top bar that will rest on the hive body.
    - Place all top bars with wax ridges starting from the front of the Kenya Top Bar Hive.
    - Place the rest of the top bars without wax ridges up to the end of the beehive.
    - For a Greek Basket Top Bar Hive place top bars with wax rides starting from the centre and they should be placed at right angles to the hive entrance.

Factors to Be Considered When Mounting Top Bar and Frame Hives

• Place hive at a workable height.
• Hive entrance to face leeward side to prevent draughts.
• Place hive under shade to prevent the hive from direct heat of the sun.
• Top of hive to be covered with a roof top.
• Consider security from enemies of honeybees.

Handling honeybees

Steps to follow when manipulating honeybee colonies

Put on the complete bee tight suit consisting of:

- A zip up overall
- Jacket
- Hat and veil
- Gloves
- Light the smoker and ensure that there is a smooth flow of smoke
- Approach the hive from the back or side.
- Apply 3-4 gentle puffs of smoke into the hive through the entrance.
- Wait for a few minutes to allow honeybees to engorge honey.
- Remove roof top for top bar hives and the top cover for frame hives.

• Start lifting top bar hives using a hive tool.

Start from the back for a Kenya Top

Bar hive and from sides for both frame and Greek Basket Top Bar hives.

• Smoke should always be available and apply gentle puffs at regular intervals to control the temperature of honeybees. A beekeeper should be assisted to make the work easier.

Brood Nest Inspection

• Inspect the brood nest 2-3 times a year especially during the swarming season.
• Inspect the hive in winter as briefly as possible to prevent chilling the brood and robbing of honey by bees from adjacent beehives.
• Push light honeycombs to the empty side.
• Take out the darker combs and examine one by one but not exposing them to the cold wind or sun.
• Look for eggs, larvae and pupae to ensure the presence of the queen bee but brood can be absent as the queen reduces egg laying at this time of the year.
• Place the top bars back onto the hive in the same order and position to maintain the structure of the hive or nest.
• Place combs with drone brood cells to the edge of the brood nest on the empty side of the hive.
• Spare valuable space of the brood nest especially 5 combs mainly for new workers instead of unproductive drones.
• Remove crooked combs, very black ones or combs with large patches of drone brood from the brood nest.

Cropping

• Take only combs with capped honey.
• Uncapped honey contains too much moisture in excess of 17 percent, which can lead to fermentation of honey soon after cropping.
• Do not take any combs containing brood.
• In the case of combs from top bars, crop when 75 percent of a single comb has capped honey.
• Cut off the capped portion and tie back the portion with brood on the same top bar.

Grading

• Grading of honey starts at cropping.
• There are four grades of honey based on colour, aroma, flavour and moisture content.

First Grade

• New wax combs
• Light coloured honey
• No pollen grains
• Acceptable flavour/aroma
• Low moisture content

Second Grade

• New wax combs
• Medium light honey
• Very little pollen
• Few uncapped cells/honey (80 percent capped)
• Acceptable flavour/aroma
• Low moisture content

Third Grade

• Mostly new combs
• Light brood combs
• Small amount of uncapped cells
• Acceptable flavour
• Low moisture content

Fourth Grade

• Old combs
• Dark honey
• Pollen present
• Doubtful flavour
• Medium moisture

Marketing

• Honey is in comb or liquid form and prices are determined by the grades.
• Marketing is controlled by legislation.

Methods of honey extraction

Floating.

• Break honey combs into small pieces.
• Tie the broken combs in a cheese cloth.
• Hang the cheese cloth in a warm room and honey will slowly drip into a clean bucket placed below.
• Leave the honey to drip overnight.

Centrifuging

Centrifuging is ideal for extracting honey from frame combs

• Uncap the combs using a hot uncapping knife.
• Place the uncapped frames in an upright position in a mechanical honey extractor.
• Place settling tank with strainer below the outlet and start centrifuging.
• Honey collects in the settling tank.
• Settle honey for at least 10 days to allow air bubbles and impurities to float.
• Scoop out the impurities and honey will be ready for bottling.

Enemies of the honeybee and control

Man

• Destroys the honeybee and its habitat.

Control:

• Education
• Law enforcement
• Keeping honeybee colonies in Bee Houses

Bee wolves (wasps)

• The females use the adult bee as food for their larvae. It catches the bee at the hive entrance.

Control:

• Usually difficult
• Water with a film of paraffin in a dish and placed close to the hive entrance is used for trapping bee pirates. The bee pirate plunges in water on seeing its image in the paraffin film. A few honeybees will be lost but the loss can outweigh the advantages obtained from the elimination of the bee pirates.

Honey Badgers (Mellivora capensis)

• Its skin is loose and so tough that the dog’s teeth cannot penetrate.
• It has strong claws for digging and strong teeth for biting and breaking hives.
• Badgers do not suffer from stings. They overrun hives, break them up and feed on the brood and honey.

Control:

• Trap or hunt to shoot them
• Secure the beehives

Wax Moth (Galleria mellonella)

• The larvae of the wax moth feeds on combs
• Weak colonies are vulnerable to attack by the wax moth larvae.
• Growing larvae construct silk lined tunnels through the cell walls. Larvae prefer dark combs because they contain a variety of growth enhancing impurities such as entrapped pollen and cast larval skin.
• Mature larvae usually spin cocoons in oval depressions that they chew on the inside of hive bodies, inner cover, lid and on frames. They even make some deep furrows on top bars and the inside of Kenya Top Bar Hives.

Control

• Maintaining strong colonies
• Avoid queenlessness of colonies
• Put infected combs in freezers for about 48 hours
• Carbon dioxide fumigant

Large Hive Beetle (Coleoptera)

• The beetles interfere with the activities of honeybees as they gather at beehive entrances, crawl on combs and hive floors. They also feed on wax leaving combs very thin.

Control:

• Control is difficult but honeybees propolise them
• Hand pick and throw them in soapy water.

Ants (Hymenoptera)

• Especially the tropical ants are serious pests
• They steal honey, bee brood or live in the colony where honey bees cannot remove them.
Vermiculture is the practice of using worms to decompose organic matter, such as kitchen scraps, yard waste, and agricultural residues, into nutrient-rich compost known as vermicompost or worm castings. It is a form of composting that harnesses the natural feeding and digestion process of earthworms to convert organic waste into a valuable soil amendment. In vermiculture, specific species of worms, such as the Red Wigglers (Eisenia fetida), are used due to their ability to efficiently process organic waste and produce nutrient-rich castings. These worms consume the organic matter, breaking it down through their digestive system and excreting nutrient-rich waste. Add kitchen scraps such as fruit and vegetable peels, coffee grounds, tea bags, and crushed eggshells to the bin. Avoid using earthworms or night crawlers as they are not well-suited for the confined space of a worm bin.

Choosing the right worms: Red worms (Eisenia fetida or Lumbricus rubellus) are the most commonly used worms for vermicomposting. They are efficient composters and thrive in the bin's environment. Avoid using earthworms or night crawlers as they are not well-suited for the confined space of a worm bin.

Feeding the worms: Feed the worms a balanced diet of organic waste. Kitchen scraps like fruit and vegetable peels, coffee grounds, tea bags, and crushed eggshells are ideal. Avoid adding meat, dairy, oily foods, and citrus fruits as they can attract pests or create unfavourable conditions.

Temperature and ventilation: Worms prefer temperatures between 15°C and 25°C Celsius. Avoid extreme temperature fluctuations. Adequate ventilation is essential to prevent the bin from becoming too hot or stagnant. Drill small holes in the bin or leave gaps in the lid for airflow.

Harvesting and maintaining the system: Harvest the compost when it appears dark and fetid. Collect the compost and set it aside. Leave some unfinished compost and worms in the bin to continue the composting process. Add fresh bedding and food scraps to the bin regularly to sustain the worm population. Monitor the moisture levels, temperature, and overall health of the worms. Adjust as needed to ensure their well-being.

Vermiculture, also known as vermicomposting, offers several benefits for soil improvement, waste reduction, and the creation of nutrient-rich compost. Here are the key advantages of incorporating vermicomposting into your gardening practices:

- Soil Improvement: Vermicompost, the end product of vermicomposting, is a highly potent and nutrient-rich fertiliser. It improves soil structure, texture, and fertility.
- The beneficial microorganisms present in vermicompost help break down organic matter and make essential nutrients more accessible to plants.
- Vermicompost enhances soil water retention capacity, reducing the need for frequent irrigation and improving drought resistance.

Waste Reduction: Vermiculture provides a sustainable solution for managing organic waste. It allows you to divert kitchen scraps, yard trimmings, and other organic materials from landfills.

Nutrient-Rich Compost: Vermicompost contains a balanced mix of macro and micronutrients essential for plant growth, such as nitrogen, phosphorus, potassium, calcium, and magnesium.

The organic matter in vermicompost enhances soil fertility, promotes beneficial microbial activity, and supports healthy root development in plants.

Unlike synthetic fertilisers, vermicompost releases nutrients slowly, providing a steady and long-lasting supply to plants.

Environmental Benefits:
- Vermiculture reduces the need for chemical fertilisers, pesticides, and herbicides, minimising the environmental impact of conventional gardening practices.
- The use of vermicompost improves soil health, promotes biodiversity, and contributes to sustainable agriculture by reducing reliance on synthetic inputs.

Cost-effective and Easy to Implement:
- Vermicomposting can be done on a small scale, making it suitable for home gardeners, community gardens, and urban areas with limited space.
- It is a cost-effective method, as it utilises organic waste that would otherwise be discarded, reducing the need for purchasing fertilisers.
- Vermicompost is a highly potent and nutrient-rich fertiliser, improving soil structure, texture, and fertility.
- The beneficial microorganisms present in vermicompost help break down organic matter and make essential nutrients more accessible to plants.
- Vermicompost enhances soil water retention capacity, reducing the need for frequent irrigation and improving drought resistance.

If you're interested in turning your vermiculture hobby into a small-scale business, here are some advice and steps to consider:

Research and Planning:
- Conduct thorough research on vermiculture and the market demand for vermicompost in your area. Understand the potential customers, competitors, and pricing.
- Develop a business plan that outlines your goals, target market, marketing strategies, production capacity, and financial projections.

Start Small and Scale Gradually:
- Begin with a manageable scale, especially if you're new to running a business. Start with a small number of worm bins and gradually increase your production capacity based on market demand.
- This approach allows you to gain experience, refine your processes, and assess the feasibility of expanding your business.

Set up Production Facilities:
- Create an appropriate space to house your worm bins. Consider factors like temperature control, ventilation, and protection against pests.
- Ensure sufficient space for the worms to thrive and multiply. Provide suitable bedding materials, such as shredded newspaper or cardboard, and organic waste for the worms to feed on.

Establish a Reliable Supply of Worms:
- Source high-quality worm species suitable for vermicomposting, such as Red Wigglers (Eisenia fetida). Ensure that the worms are healthy and free from diseases or pests.
- Develop a breeding and propagation system to maintain a continuous supply of worms for your business.

Develop a Marketing Strategy:
- Identify and target potential customers for your vermicompost, such as local gardeners, landscapers, nurseries, or agricultural farms.
- Highlight the benefits of vermicompost in your marketing efforts, emphasising its organic nature, nutrient content, and positive impact on soil health.
- Utilise various marketing channels, including online platforms, social media, local advertisements, and networking within the gardening and agricultural community.
Equine Agritourism

Agritourism is a type of tourism that involves visiting farms, old plantations, gastronomic festivals, or other agricultural businesses for the purpose of experiencing rural life, culture, and food. Agritourism combines agriculture and tourism to promote sustainable tourism, support local agriculture, and provide economic benefits to rural communities.

Types of Agritourism Businesses

An agritourism business can be defined as any person, farm, or corporation actively engaged in the operation, management, or promotion of an agriculturally-related tourism business open to the public. Examples of agritourism activities include but are not limited to:

U-picks
U-pick farms give customers a hands-on farm experience by inviting them to come pick products from the field to purchase and take home. Common types of products offered at u-pick farms include fruits, vegetables, pumpkins, flowers, and Christmas trees.

Farms that grow and sell pumpkins. On-farm pumpkin patches often sell their pumpkins as a u-pick through an on-farm market.

On-farm markets
On-farm markets give customers the opportunity to come purchase produce and/or products on the farm property. Common types of farm markets include farm stands (outdoor booth on the farm) and farm stores (enclosed store on the farm).

Vineyards and wineries
Farms and businesses engaged in growing grapes for wine and/or wine making. Many wineries provide on-farm entertainment including, but not limited to, wine-tastings, wine-trails, music, and on-farm dinners.

Floriculture farms
A flower farm that invites visitors to come see or experience the flower crop in the field. Floriculture farms may host events and workshops, provide a flower u-pick and offer photography opportunities.

Demonstration farms
A working farm that invites visitors on their property to see or experience the farm. Examples of demonstration farms include but are not limited to dairies, conservation farms, and cattle ranches.

Farm stays
Farm stays is when visitors stay on the farm property and partake on activities such as:

1. Farm camps
An educational opportunity for kids to come experience a farm and engage in agriculture practices.

2. Farm-to-table dining
On-farm dining experience, often including a specialty chef, farm fresh food, and entertainment.

Equine Agritourism

Opportunities for visitors to come interact with horses on the farm. Types of equine agritourism can include trail riding, horseback riding lessons, dude ranches, horse camps, boarding facilities, and equine therapy farms.

Fee and Lease Pond Fishing
Landowners opening up their pond to visitors for fishing.

Exploring agritourism

Hunting Leases
Landowners inviting visitors on their land to hunt usually for a fee.

Management

Best Management Practices for agritourism business include:

1. Providing an authentic farm or ranch experience
2. Providing an educational experience
3. Providing excellent customer service
4. Providing adequate public facilities
5. Maintaining a safe and accessible environment
6. Creating good community relations
7. Planning for your financial future

When starting an agritourism business or assessing your existing operation, consult the available resources and consider the following best management practices:

• **Authentic Farm or Ranch Experience** — Agritourism provides visitors with an educational experience aside from one that is solely commercial. It is important to keep in mind that your farm/ranch is often the “face of farming and ranching” in your community, region. A product you offer to visitors may be the experience of farm or ranch living. It is also important to understand what aspects of agriculture your local associations (agricultural, tourism, and marketing) emphasise in your region so that you can develop your own niche in coordination with other farms and attractions nearby.

• **Educational Experience** — Farms and ranches can offer an agriculturally-oriented educational experience suitable for different ages. Food and fibre production, land stewardship, and history of agriculture are common topics that visitors enjoy learning about. Another way to diversify your operation and educate guests may be on-property recreational activities (e.g., fishing, hunting, trail riding, cross-country skiing, or hiking).

• **Customer Service** — This should be an integral part of your business planning. Training your staff to interact with customers in an appropriate way will ensure a safe and high quality experience for customers. It also ensures these customers will return and tell other potential customers about your business.

• **Advisory Public Facilities** — Your farm/ranch needs to have sufficient capacity (staff and infrastructure) to provide basic services such as parking, transportation, signage, customer assistance, education, and roads. In order to maintain a safe and customer friendly business, provision of services and facilities like restrooms becomes necessary.

• **Safe and Accessible Environment** — You should ensure that your property and facilities are maintained and in compliance with zoning, health, food safety, and environment regulations. It is useful as well to create a risk management plan for your farm/ranch.

In addition, depending on your type of business, consider compliance with the Americans with Disabilities Act, which mandates equal access to facilities to certain facilities (entrances, exits, and bathrooms).

• **Community Relations** — To create good community relations, it is important to regularly provide opportunities for organised groups and individuals in your community to visit your property (for example, schools and business associations).

• **Planning for your Financial Future** — Regularly review your business plan and appropriately add value (price) to all farm/ranch services, products, and experiences in order to provide for the long-term sustainability of your business.

Marketing

What is your farm story? How you market and promote your farm is an essential part of managing your business. Telling your story, having a clear mission and creating a culture for customers to engage in will help develop an environment where customers feel welcome. It is important that you understand and are passionate about the agritourism business you are promoting.

Start by developing a marketing plan. Who is your target audience? What experience and education do you want to share with them? How are you going to communicate with them? Thinking about your target audience will help you narrow down your best marketing channels. Having an online presence through websites, blogs, social media, e-newsletters, and Google is a great way to reach a broad audience. It is important to keep your business information updated on a regular basis. Other forms of marketing may include print ads, trade show participation, marketing, tourism organisations, and agritourism/farm associations.

A powerful business marketing tool is reviews from satisfied customers. Whether it is by word-of-mouth, social media, or Google reviews, satisfied customers will be an asset to your business. New customers grow your business; satisfied repeat customers sustain and market your business to another wave of customers.

Many producers who are involved in agritourism note there is synergism in having non-competing agritourism enterprises in the area to increase traffic to the area and provide more tourism attractions for customers.

Risk Management

Farmers and ranchers are legally responsible (liable) for the well-being of their customers and employees. Considering safety and minimizing risk are important parts of business planning.

To protect your agritourism business, it is important to create a risk management plan. Some of the main areas of risk and negligence include site safety risk, product risk, employee related risk, and financial risk. To ensure the well-being of your business, it is recommended that you avoid certain activities, use liability waivers, purchase insurance, practice good management techniques, train employees, and pay attention to the legal structure of your business.

Checklist for Managing Risk

**Contact Local Agritourism Organisations and Key Consultants**

Key consultants to determine your needs are lawyers, insurance agents, financial managers, and accountants.

**Inventory Areas of Possible Risk**

**Site Safety:** Consider physical site hazards including visitor activities and attractive nuisances such as farm equipment likely to attract children.

**Product:** Consider what you are selling or producing and any health or safety regulations or considerations

**Employee related:** Know your employees and know what will be required on-site to safeguard their health and safety

**Financial:** Consider current record-keeping, billing processes, assets and debts

**Develop a Risk Management Plan**

**Site Safety and Signage**

• Post rules for customers and conduct regular inspections

• Post and implement employee rules and regulations

• Using proper signage can help reduce liability, but it does not remove liability.

**Product**

1. Establish a labelling protocol for products

2. Establish a protocol based on regulations for handling products

**Source**

www.agmrc.org/commodities-products/agritourism