Liquid asset status on warehouse receipts

Mortality in piglets: causes and management

Feeding the beef breeding mature cow

Black Soldier Fly reduces livestock feed costs

MEAT CLASSIFICATION, GRADING AND CONSUMERS PREFERENCES

GET MORE YIELD IN THE FIELD
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Meat classification, grading and consumers preferences

John Taderera

Background

THE meat grading unit falls under the Department of Livestock Production and Development in the Ministry of Lands Agriculture, Fisheries, Water and Rural Development. The unit has the mandate of providing regulatory services to the meat and livestock industry through the statutory instruments (SL) 182 of 2000 and 240 of 2001 that deal with live livestock and carcass classification and grading.

The main purpose of classifying and grading carcasses and live animals is to attach value to either a carcass or live animal as well as assessing quality of live animals and carcasses of cattle, sheep, goats and pigs.

The meat and livestock grader works as an arbitrator between the producer and buyer/abattoir owner so that no one is fleeced at the end of the transaction. How does the Meat and Livestock grader classify and grade carcasses?

Before coming with the grade, we need to know the difference between classification and grading as applied to carcasses and live animals. Classification is a set of descriptive terms describing features of the live/carcass that are useful to those involved in the trading of live animals and carcasses. The purpose of carcass classification is to classify carcasses and live animals based on clearly defined quality attributes to ensure more consistent meat quality and consumer satisfaction.

This means that carcasses of similar composition and quality are classified in the same category to reduce the variation between carcasses and ensure more consistent end product.

Grading is the placing of different values on carcasses for pricing purposes, depending on the market and requirements of traders. Grading invariably involves value judgements, the concept of better and worse and the use of price differentials between grades for carcasses according to the buyers and their customers. What attributes constitute carcass classification?

Age Classification

Age classification classifies age for animals according to the number of erupted permanent incisor teeth above the level of the gum. Dentition probably describes chronological age of the animal as the best despite the variation experienced among breed types and nutritional plane (Lawrence et al 2001) regarded a dentition-based systems more accurate than the bone ossification. Livestock in Zimbabwe are slaughtered at various stages of maturity hence age classification is critical as a meat tenderness determinant factor.

Fat Cover classification

Carcasses shall be classified according to the depth of subcutaneous fat covered on the lateral surface of a carcass at a point 5.0 cm lateral to the mid-line cut between the 10th and 11th ribs. Carcasses are allotted to one of the ten conformation classes with A+ as the best and E- as poorly fleshed.

Sex classification

Castrated males result in fatter carcasses.

Conformation classification

Conformation is defined as the total thickness of muscle plus fat thickness, in relation to the dimension of the supporting skeleton. When using objective system of classification and grading in cattle carcass conformation shall be determined on the basis of hot dressed mass of the heavier side and carcass length measured between the anterior edge of the pubic symphysis and the mid-point of the surface between the last cervical and first thoracic vertebrae. Carcasses are allotted to one of the ten conformation classes with A+ as the best and E- as poorly fleshed.

Combination of all the above attributes will give a resultant grade. The carcass grades we have in Zimbabwe are super, choice, commercial, economy and manufacturing.

Super grade

Grade for young animals aged 0-6 teeth excluding bulls classified as bullock (BU). Animal exhibits excellent muscle and fat development. Carcasses in this grade are uniformly and at least fairly well covered with subcutaneous fat but not excessively. The subcutaneous fat is optimum covering. Super beef carcasses are roller marked with purple ink colour.

Choice grade

Grade for mature and young well finished animals excluding bulls and stags. Mature animals look smooth with convex muscle development pattern. Fat is visible in all critical areas. Bones cannot be seen or felt with firm pressure. On the hook, a mature animal grades as Commercial and the young as Commercial or Choice. Choice beef carcasses are roller marked in red ink colour.

Commercial Grade

Grade for mature cattle with 7-12 permanent incisors excluding bulls and stags. Animal shows rectilinear muscle development profile and is adequately covered with fat. Vertebrae bones, ribs, hook and pin bones can be seen partially and feel rounded to the touch. Commercial beef carcasses are roller marked in brown ink colour.

Economy Grade

Grade for all ages of cattle including bulls and stags.
Meat and fat colour
- Manufacturing Grade
  Grade for all ages of cattle. Animal is of poor muscle development. Bones are individually visible and they appear sharply. On the hook, the animal grade as Economy or in exceptional cases, it is graded as Manufacturing. Manufacturing beef carcasses are roller marked in brown ink colour.

- Tenderness
  Tenderness is considered by Zimbabwean consumers to be the most important component of meat quality. Tenderness can be measured using an instrument in which a blade is forced through (shears) a piece of meat of fixed dimensions that has been cooked following a standard procedure. The force required is measured and this is taken as a measurement of the toughness of the meat. There are two main components to meat tenderness, a myofibrillar (muscle) component and a connective tissue (collagen) component. The size of the muscle fibres increases with increasing age and may be tougher. Muscle fibre toughness can be minimised by good animal handling prior to slaughter, the use of electrical stimulation, the handling procedures used in the factory, appropriate carcass chilling practices, and by ageing post slaughter.

- Juiciness
  Juiciness is an important component of meat texture and palatability and has two major components. The first is the impression of wetness produced by the release of fluids from the meat during the first few chews. The second is the more sustained juiciness that apparently results from the stimulating effect of fat on the production of saliva and the coating of fat that builds upon the tongue, teeth and other parts of the mouth. Juiciness tends to be associated with marbling; hence heavier, fatter animals produce beef which seems juicier. Juiciness tends to decline as animal ages. The meat of young animals gives an initial impression of juiciness, but because of the relative absence of fat, ultimately a dry sensation in the mouth.

- Aroma and Flavour
  The aromas of meats can be associated with either the water in the meat or the fat components of the tissue. The chemical components responsible for “meat flavour” per se are found in the water-soluble fraction and this flavour is essentially the same for all species. As the fat content of meat increases, so does the flavour. Thus, beef from older animals is more intense in flavour than meat from younger animals. Flavour is influenced by the deposition of compounds from the feed in the fat of the animal. This is characteristic of some but not all pasture/grass diets. Some plants, particularly legumes, contain specific flavour inducing components. The concentration of these components is higher when plants are younger and leafy and there are thus seasonal effects on flavour.

- Texture
  The eating quality of meat is assessed ultimately by the consumer. The texture of meat can be defined as the sensory manifestation of the structure of meat and manner in which this structure reacts to the force applied during biting and specific senses involved in eating. It is how meat feels in the mouth during manipulation and mastication. Attributes of meat by taste panels talk of the sensations of texture, tenderness, juiciness, flavour and overall acceptability.

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Horticulture

The secrets of horticultural farming business in winter

Introduction

Horticultural farming in winter does not have to be a difficult task. With the right skills and preparation, you should produce good-looking beautiful and productive horticultural fields throughout the cold months. Horticulture in winter is all about being profit oriented from planting season-appropriate crops to proper management for optimal growth. You need to protect crops from frost, grow vegetables that thrive during the cold season, attract consumers from buying the produce, and get higher returns. So let us get started on some horticultural key areas so that you get more from your fields.

Land preparation and variety selection

You have to choose varieties according to your region that is climate smart. Land preparation with flat beds before planting the chosen crop in early winter. This includes removing any weeds from the field so they do not compete with new growth during the cold months ahead. Add organic matter such as composted manure or farmyard manure to help improve soil drainage and aeration while providing nutrients for plant growth.

When it comes time to plant, the best varieties of winter crops and vegetables in winter, make sure that each one is planted at least two inches deeper than its original depth when grown in greenhouses — this helps protect against frost damage during colder weather conditions.

If possible, cover newly planted areas with mulch after planting to help insulate roots from extreme temperature swings between day and night time hours during these months too. Finally, use stakes if needed when transplanting crops and trees so they remain upright until their root systems become established enough not to require additional support later on down the road.

One of the most critical factors in achieving higher yields is establishing an optimum population that allows a hybrid to maximise its yield potential. It is important to always aim to achieve optimum population levels depending on varieties, irrigation systems, and nutrition-related conditions while following practices that will enhance stand establishment. Adjust seeding depth according to soil conditions, monitor planting depth periodically during the planting operation, and adjust for varying soil conditions.

Due to climate change, water is increasingly becoming a limiting factor to yields. High yields of horticultural crops often of minimum thresholds can be achieved with irrigation. Where irrigation is available, higher yields can be obtained through early crop establishment before the peak of the irrigation is applied to minimise yield losses due and it is substantive in attaining good crop standing in the cool season. Thorough land preparation also aids moisture conservation.

Fertility trenches in horticulture for enhanced productivity

A fertility trench is a deep trench filled with layers of soil and organic matter. It is like a compost pile, but underground. The rain that falls during the rainy season soaks into the soil in the trench. The organic matter in the trench holds the water for crops to use after the dry season begins. It is easy to make a fertility trench.

How to make a fertility trench

• Dig a trench 60 centimetres deep and 45 cm wide.
• Gather some organic materials such as weeds and grass, crop residues, kitchen scraps, manure, bones, feathers, and anything else that will rot as time passes.
• Now put a 50-centimetre layer of these organic materials at the bottom of the trench. Thirty centimetres is approximately the distance from your elbow to your wrist. If you have some water to spare, sprinkle two buckets full of water over the layer of organic materials. The water will help the scraps and other organic material to rot.
• Add a layer of soil 10 centimetres deep. Then add another 30-centimetre layer of organic matter. On top of that, put 10 centimetres of soil. Now put in enough organic matter to fill the trench up to ground level or just below ground level. If the fertility trench is sunk a bit into the ground, water can collect there very easily.
• Now cover the trench with a layer of grass and leaves to keep the soil from drying out. If you are farming or gardening on sloping land, even on a gentle slope, be sure to dig your trench along the contour. That is, dig across the slope, not up and down. Also, take any extra soil you have and form a mound on the downslope side of the fertility trench. This mound will collect some of the water flowing down the slope so that it can soak into the trench.

The organic matter that’s in the trench soaks up water and holds it for a long time. Even during dry periods, it holds water that your plants can use. And, as the organic matter in the trench rots, it adds good plant food to the soil.

After each harvest, dig the crop residues back into the ground. Try to grow a different crop every season. Also mix in other kinds of organic matter including kitchen waste and manure. This will enrich the soil and hold it to hold water.

You can grow all sorts of crops on this fertility trench garden — sweet potatoes, tomatoes, peppers, okra, and even fruit trees. And while your plants are growing, all the organic materials that you have put into the trench below are turning into good plant food.

Onward Maramuра

Snow mangemout peas in field
What is warehouse receipt? A WAREHOUSE receipt (WR) is a document that provides proof of ownership of the commodities stored in a warehouse. The WR is issued by the warehouse operator to the commodity depositors typically farmers or traders when the commodities are delivered to the warehouse. The Warehouse Receipt captures details of product quantity, quality, and storage location, as well as information about the commodity depositor and warehouse operator. A Warehouse Receipt is a legal document that can be used as a proof of ownership of commodities in warehouse and is tradable in a regulated securities market. Warehouse Receipts are commonly used as a financing mechanism in agricultural markets, where farmers in need access to credit to finance their operations can use WR as a collateral. This helps to reduce credit risk and therefore the cost of borrowing to the farmers.

The warehouse receipts issued through the ZMX operations are negotiable instruments thereby allowing for transfer of ownership of the underlying commodity without having to deliver the physical commodity. The warehouse receipts are issued in negotiable form, making them eligible as collateral for loans. Warehouse receipts are also recognised as securities in terms of the Securities Act. It is a legal requirement in terms of the Warehouse Receipt Act Chapter 18:25 of 2006 and the Statutory Instrument 234 of 2020 (Warehouse Receipt General Regulations) that the Commodity Exchange keeps a record on the status of all issued warehouse receipts and be able to account for them and the commodities stored.

The meaning of Liquid Asset Status

The Warehouse Receipt Instruments issued under the ZMX operations are negotiable instruments thereby allowing for transfer of ownership of the underlying commodity without having to deliver the physical commodity. The warehouse receipts are issued in negotiable form, making them eligible as collateral for loans. Warehouse receipts are also recognised as securities in terms of the Securities Act. It is a legal requirement in terms of the Warehouse Receipt Act Chapter 18:25 of 2006 and the Statutory Instrument 234 of 2020 (Warehouse Receipt General Regulations) that the Commodity Exchange keeps a record on the status of all issued warehouse receipts and be able to account for them and the commodities stored.

Finance and Economic Development Minister Professor Mthuli Ncube (tolling bell), officially launches the Zimbabwe Mercantile Exchange (ZMX) at Meikles Hotel in Harare in 2021

Benefits of Liquid Assets to Warehouse Receipt Holders

- The LA status on warehouse receipts, increases the attractiveness of the receipts to lenders, making it easier for farmers to obtain financing at lower interest rates because liquid assets are generally considered to be less risky than illiquid assets, which reduces the cost of borrowing for the farmer.
- Having the liquid assets, increases the liquidity of the receipts themselves. This means that farmers may be able to sell their warehouse receipts on the secondary market more easily and at a higher price, providing them with additional sources of liquidity and potentially increasing the value of their collateral.
- Having the status of a liquid asset increases the efficiency, transparency and standardisation of the warehouse receipt system and agricultural value chain at large. This can improve the credibility of the system, making it more attractive to investors and lenders, and increasing the overall efficiency of the agricultural supply chain.

Benefits of Liquid Assets to Warehouse Receipt Holders

- The LA status on warehouse receipts, increases the demand for warehouse receipts, making them more attractive to farmers and other depositors, potentially leading to higher revenues and profits.
- The classification of Warehouse Receipts as liquid assets, increases the liquidity of the receipts themselves. This means that warehouse operators may be able to sell the receipts on the secondary market more easily and at a higher price, providing them with additional sources of liquidity and potentially increasing the value of their collateral.
- Having the status of a liquid asset provides greater transparency and credibility to the warehouse receipt system. This can improve the reputation of warehouse operators, making it easier for them to attract new business and build long-term relationships with farmers and other depositors.

Other attributes of Warehouse Receipts

The common attributes of the warehouse receipt include:

1. Proof of ownership: A warehouse receipt is a document that provides proof of owner-
Mortality in piglets: causes and management

Erica L. Takaindisa

- Introduction

PRE-WEANING mortality in pigs refers to deaths recorded in the litter before weaning. This is a major area of inefficiency in pork production enterprises, as it translates to lost profit opportunities. It reduces the number of pigs weaned per sow per year – an important performance parameter in sow units. Ideally, farmers should aim to achieve mortality rates not exceeding 5-10 percent but in reality, farmers have reported higher figures of up to 20 percent or higher, hence the need for specific management intervention to reduce mortality rates in the farrowing house. It is important to note that there are some biological factors, which pre-dispose piglets to death and these include:

- Low initial body weight
- Lack of substantial energy stores in piglets
- Poor body temperature regulation
- Lack of hair coat and other insulation
- Competition among litter mates for colostrum and milk

Although the causes are discrete, pigs die from an interaction of the several causes, for example, small piglets are prone to cold and therefore will be more likely to succumb to the sow to obtain warmth. Such a piglet will be more likely to be crushed due to its proximity to the sow. Piglets that fail to suckle due to a disease or being outcompeted at the udder can continuously fail to compete and become weaker, continue missing milk and finally starve to death. The death could be recorded as just starvation but in reality, it was a combination of size, ability to maintain a constant thermal status, conducive environment for suckling and pathogens in the environment that all contributed to the pig’s death. As the length of parturition increases as a result of a large litter size or increased birth weight, it will be more likely that the piglets will be subjected to hypoxia (lack of oxygen). Newborn piglets will kill the piglets before birth but will also result in piglets that are born with a reduced viability. These piglets will then become more likely to starve, become crushed or diseased. In large litters, pre-weaning mortality can increase by having a large within litter variation in piglet weight, thus allowing some piglets to outcompete their siblings, causing them to starve or to become crushed.

Causes of pre-weaning mortality

Crushing

More than 50 percent of pre-weaning mortality is due to crushing by the sow. Piglets are crushed when the sow changes position, essentially moving between lying and standing and vice versa, and also when she rises and sets her positions. During and immediately after farrowing sows can be restless and as the piglet birth weight is around one percent of the sow’s weight it can be quite easy for an undetected piglet to be crushed. Starvation and crushing account for 50-80 percent of piglet deaths.

- Sow in farrowing crate

Farrowing crates are used to restrict the sow movement and thereby reducing incidences of crushing. Incidences of crushing are high where there is no provision of a well-designed farrowing crate, the sow is restless and also where piglets have birth weights lower than 1.5 kg.

- Chilling

One of the most significant stressors a pig experiences upon birth is the challenge to adapt to the thermal environment. Unlike many mammals, piglets do not possess brown adipose tissue, a type of fat that enables newborn animals to generate a great deal of heat to maintain body temperature. This fact combined with very little subcutaneous fat and a lack of a protective hair coat, ill prepares the piglet to enter a cold environment. Thus, the piglet is required to stay close to the sow or a heat source to avoid getting exposed to cold temperatures. The shivering response is used as a back-up response for the piglet to generate heat in a cold environment. If the piglet has been subjected to cold stress it will be more susceptible to disease, starvation and crushing. The sow’s belly provides an excellent heat source for the new born pig but positions it in a location in which it may easily become crushed. Without an adequate substitute, source heat crushing rates can be very high.

The use of heat lamps has helped dramatically to move pig away from the sow and into a safe area to avoid crushing.

Unfortunately, the piglets’ attraction to the heat lamp is not solidified until approximately Day 3 after birth. It is during these first three days that most pre-weaning deaths occur. During the first three days after birth, piglets have a high attraction to the sow’s abdomen and relatively little attraction to the heat lamp. As with other causes of piglet mortality, thermal stress has complex interactions with many factors. They are often out-competed at the udder and thus predisposed to starvation, which as highlighted can in turn result in them getting crushed. The environmental temperature for a newly born piglet is recommended to be 34 degrees Celsius.

- Poor Nutrition

Adequate milk production by the sow is critical for proper nutrition of the piglets. Larger litters require a much greater rate of milk produced by the sow to ensure survival of the entire litter. It is important to maintain an environment that allows the sow to maximise feed intake. Environmental and disease stressors can both contribute to decreasing sow feed intake. Water should be available all the time. Heat stress is especially capable of depressing feed intake. This poses a difficult situation as the producer must balance the needs of the piglet for a warm environment, with that of the sow for a much cooler environment of around 18 degrees Celsius.

- Disease

Although the majority of pre-weaning losses are due to non-infectious causes which are strongly associated with management practices, deaths due to disease do occur and can be quite devastating. A clean environment goes a long way in providing a disease-free state for both the sow and the piglet. As with all mammals, the piglet’s immune system is not developed at birth and depends on the transfer of maternal antibodies to provide protection against disease. Therefore, ingestion of colostrum, the antibodies rich milk that is produced maximally by 12 hours after parturition, is critical for piglet survival. After 48 hours of life, the piglet gut is no longer able to absorb these protective antibodies. By 10 days of age the piglet is able to produce its own antibodies and this provides an overlap from the protection of the maternal antibodies. Any factor such as cold stress that decreases colostrum intake that is therefore experienced by piglets that are subjected to 50 percent within six hours of the initiation of parturition, sows having larger litters and therefore a longer farrowing duration may predispose their last-born piglets to receive a lower level of passive immunity. There are routine vaccinations carried out on the sow to reduce challenges of diarrhea in piglets. Iron injection to prevent anaemia in piglets is also recommended as a routine.

Savaging

Savaging behaviour is characterised by a sow that is aggressive to her piglets and may result in injury or death to a portion of the litter. Research has shown that if lights were left on in the farrowing house, a reduction in the incidence of savaging was realised. Animals that savaged piglets as gilts were more likely to savage during the second parity. Data indicates that savaging sows are fearful of humans and that sows that readily interacted with humans were non-savaging and more protective of their litters. Fear of the piglets and the pain associated with parturition, has all been implicated in savaging behaviour. A decision can be made to cull sows with savaging behaviour.

- Stockmanship

Normally in a pig production enterprise when people talk of productivity they often look and concentrate on factors of production comprising genetics, management, nutrition, record keeping, housing and health. Little or no emphasis is placed on stockmanship, which is the art of properly handling animals. It has to be borne in mind that it will be difficult to produce good results without the right stockman. Once the right stockman has been identified, there is need for training and availing the necessary support and rewards. The stockman forms the corner pillar for a pig production enterprise and is key in enabling the other factors to contribute meaningfully to production.

- Conclusion

It is imperative to have a stockman present during farrowing to reduce crushing. Concern and vigilance during this time ensures that the stockman helps the struggling piglets find the udder and are able to consume adequate colostrum. In addition, piglets that would be crushed can be placed in a safe spot under the heat lamp until they are able to move well and compete for a teat. Those pigs that appear less viable and need the extra time under the heat lamp can be taken care of to ensure they do not become chilled. The thermal environment is probably the second most critical aspect to attend to. Ensure that the sow does not get excessively hot and that the piglets are warm is important as success in both areas will allow the sow to have maximum feed intake in support of both milk production and sow maintenance requirements.

The author is the deputy director of the Pig Industry Board
Feeding the beef breeding mature cow

Introduction
COWS are fed to keep loss of body weight in winter to a minimum. A cow calving in fair body condition (Score 3) must maintain her post calving weight throughout winter, however cows can lose up to 15 percent of their peak autumn weight up to calving without adverse effects on calving rates (Lammond, 1970).

Increase supplementary feeding after calving before there is adequate grazing. Divide the cows into pregnant and lactating cows and if not possible, increase supplements after 20 percent of cows have calved. Ideally, body weight change from previous autumn peak (April-July) to bullying should be zero to 10 percent (Richardson, Oliver & Clarke, 1975).

PERIOD 1
There is good calf growth (plenty of milk) and uterine involution (postpartum reduction in uterine size to non-pregnant state), postpartum anoestrum, the start of recycling and re-conception. It is the most critical period in which the negative effects of under nutrition manifest themselves. If cows are poorly fed in this period, it will affect milk production, calf growth, conception rates, and percentage of cows recycling, resulting in poor calving rates in the subsequent seasons. Conception is a threshold response (either cows will or will not conceive). There is no substitute for nutrient adequacy and it necessary to ensure that cows are in good condition (Score 2, 5) at re-conception.

PERIOD 2:
Early pregnancy but calf still suckling. In addition to the nutrient demand of lactation, the cow needs to gain weight in preparation for the winter months and spring calving (Oct-Nov/Dec). This is also the declining stage of lactation and nutrient requirements are lower compared to those immediately post calving. The level of nutrition will not affect the early developing foetus but the calf at foot may experience slower growth. Veld grazing would (if adequate) normally provide the cow enough energy and protein although phosphorus supplementation may be necessary.

Table on effect of protein and phosphorus supplementation on cow productivity (weaning weights and calving percentage)

<table>
<thead>
<tr>
<th>Supplement Type (grammes/day)</th>
<th>Crude Protein Intake (g/day)</th>
<th>Calving rate (%)</th>
<th>Weaning weight (kg)</th>
<th>Source</th>
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<tbody>
<tr>
<td>Nil</td>
<td>Nil</td>
<td>63.3</td>
<td>n/a</td>
<td>Bambridge (1965)</td>
</tr>
<tr>
<td>454-908 csc</td>
<td>182-363</td>
<td>76.3</td>
<td>n/a</td>
<td>Elliot (1964)</td>
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<td>Nil</td>
<td>Nil</td>
<td>50.7</td>
<td>148.9</td>
<td></td>
</tr>
<tr>
<td>908 csc</td>
<td>363</td>
<td>81.0</td>
<td>164.2</td>
<td></td>
</tr>
<tr>
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<td>Nil</td>
<td>59.2</td>
<td>124.2</td>
<td>Ward (1968)</td>
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<tr>
<td>908 GNC</td>
<td>400</td>
<td>74.5</td>
<td>134.1</td>
<td></td>
</tr>
<tr>
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<td>Nil</td>
<td>79.2</td>
<td>190.5</td>
<td>Mazorodze, Sibanda &amp; Grant (1994)</td>
</tr>
<tr>
<td>750 PC (cubes)</td>
<td>375</td>
<td>91.7</td>
<td>212.5</td>
<td></td>
</tr>
</tbody>
</table>

ZESA DIARIES
THEFT AND VANDALISM

Thief and vandalism of electricity infrastructure is a significant problem that affects the nation at large.

DID YOU KNOW ???

- It is illegal and dangerous to interfere with electrical installations.
- Vandalizing electrical infrastructure like transformers, cables/conductors, and pylon support materials results in unnecessary costs to the utility and the clients.
- Vandalism and theft deter grid expansion as the focus will be shifted to infrastructure replacements and repairs.
- Theft and Vandalism is a criminal offense that attracts a mandatory jail term of 10 years.

Don’t be left in the dark. Report any acts of theft and vandalism and help save the grid.

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Stay away Stay safe Stay alive!!!

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ENERGY SUPPLEMENTS:
these tend to reduce forage digestibility and forage intake. General rule is that the intake should not exceed 30 g/kg metabolic body weight (W 0.75) equivalent to 3.2 kg/day for a 500 kg animal (that is 500 x 0.75 x 0.030 = 11.7)
Energy supplements are used in summer, on the veld and pasture to fatten cattle for slaughter or feeding lactating cows (autumn calving)

• Sources of energy supplements:
Coarsely ground/crushed maize grain or whole grain, shelling waste and poorer grades of maize. Note: feed limited amounts, not more than 25 percent of total daily feed of maize grain spoiled by cob rots (for example Diplodia). Maize and wheat milling offal (bran) are important sources. Molasses and its by-products are also used as they are palatable

Period 3:
Corresponds to mid-gestation and follows weaning (mid lactation, 110 days, dry). There is need to maintain the foetus and this period represents the lowest feed requirements in the productive cycle of the cow. Therefore, offer cows enough feed for maintenance. It’s possible to save feed and “rough” the cows on straw and low-quality feeds if available. Cows can afford to lose 10-15 percent of its weight without major detriment.

Period 4:
The most critical period for absolute foetal growth (70-80 percent) during this period. The cow should be fed well enough to gain weight in the last 50 days (if its thin or has lost weight in winter). If nutrition is not adequate, calf birth weight, viability, milk production and later growth may be heavily reduced or abortion may occur. The plane of nutrition will affect the length of postpartum anoestrus period, which will increase the calving interval to more than a year.

• Beef cow management
The feeding, timing of breeding, calving and postpartum management are different from those of heifers. The objectives in cow management are to ensure that the cow produces a heavy weaner without experiencing calving difficulty and that it has a short anoestrus period, concaves early postpartum and reconciles annually.

• Nutritional management
Fluctuations in feed quality and supply account for the largest variation in the reproductive efficiency amongst breeding cow herds. Under nutrition is the major constraint but overfeeding and obesity should be avoided as they have adverse effects on fertility.

Note that mating occurs at a time when cows are under stress of lactation and recovering from heavy demands of the previous pregnancy. The demands of lactation, together with inadequate nutrition will result in loss of body mass (weight), prolonged anoestrus, diminished intensity of estrus, increase in silent heats and failure to conceive during the following breeding season.

Objectives of feeding cows after calving are:
1. Increasing chances of re-conception
2. Providing adequate nutrients for milk production

Note: Phosphorus deficiency leads to anoestrus, delayed sexual maturity in heifers and low conception rates
Vitamin A is important if the previous wet season ended early. Its deficiency is associated with weak calf at birth, retained placenta and reduced conception rate (injection of Vit A is necessary as a supplement- see veterinarian for advice).

Chikohwa is the Matabeleland North Province livestock specialist

<table>
<thead>
<tr>
<th>NUTRIENT</th>
<th>PERIOD 1 (0-80 days after calving)</th>
<th>PERIOD 2 (81-205 day pregnant &amp; lactation)</th>
<th>PERIOD 3 (206-315 days mid pregnancy after weaning)</th>
<th>PERIOD 4 (316-365 days pre-calving)</th>
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Table of nutrient requirements of a 500 kg cow at various stages of production
Black Soldier Fly reduces livestock feed costs

- **Introduction**
  BLACK Soldier Fly (BSF) farming for livestock feed is gaining prominence in Zimbabwe. This is on the backdrop of impressive BSF nutritional composition with high crude protein, fats and other essential nutrients.

- **Warm climate**
  Temperature and seasonal rainfall influence the availability of these BSF organic feed resources. The use of BSF is climate smart and has a much lower carbon footprint on the environment whilst also being relatively cheap to produce.

### Life cycle of Black Soldier Fly

The Black soldier fly undergo a complete metamorphosis i.e., it passes through four distinct stages (egg, larva, pupa and adult) to complete its life cycle. With optimal rearing conditions the cycle is estimated to finish within a period of 40-43 days but can be up to six months under adverse conditions (temperatures below 15 Degrees Celsius).

- **Optimal environmental conditions**
  - **Warm climate**
    The ideal temperature is between 24 and 30 Degrees Celsius. If too hot, the larvae will crawl away from the food in search of a cooler location. If too cold, the larvae will slow down their metabolism, eat less and develop slower.
  - **Shaded environment**
    Larvae avoid light and will always search for a shaded environment, away from sunlight. If their food source is exposed to light, they will move deeper into the layer of food to escape the light.
  - **Water content of the food**
    The food source has to be quite moist with a water content between 60 and 90 percent so that the larvae can ingest the substance. Moisture content should be like in fresh normal cow dung.
  - **Nutrient requirements of Larvae**
    Substrates rich in protein and easily available carbohydrates result in good larval growth. Such substrates include kitchen waste, poultry manure, rabbit manure, pig manure, abattoir waste and fish castings. Waste may be more easily consumed by the larvae if it has already undergone some bacterial or fungal decomposition process.

- **BSF production facility**
  Overall siting consideration for a BSF production facility should be taken into consideration in order to provide an environment that best mimics the natural habitat of the BSF, while at the same time ensuring a continuous waste treatment;
  a. Ensure availability of sufficient fresh waste at low cost, in predictable amounts and on a regular basis.
  b. Routes for delivery of garbage and pickup of residues should be well maintained and easily accessible throughout the year.
  c. Densely populated neighbourhoods and areas where adjacent land users may find a waste processing facility inappropriate should be avoided.
  d. Environmental buffers that separate the facility from the surroundings should be maintained (e.g., open areas, trees, fences).
  e. BSF larval production facilities should be protected from direct sunlight. Toilet and hygiene facilities should be accessible.
  f. Facility should be downwind from the residential areas.

As a rule of thumb, one can work with 50 square metres for the nursery and 100 square metres per tonne of incoming waste per day. There is also need for closed and ventilated room for the rearing.
Step 2: Setting up a nursery

Adding too much organic waste to feed the 40,000-5-Day Old larvae should be inoculated per one square metre treatment area and fed 60kg of biowaste over a period of 12 days. Larvae is ready for harvesting after 12 days of feeding. This however depends on the intended purpose of the BSF. For general use such as production of high fat and high protein animal feed meals (fish and pet food), BSF can be harvested at 12 days. For use in poultry feeds such as finisher formulations, larvae can be harvested between 14-21 days. BSF nutritional composition is maximum around 12 days of feeding.

The following operational parameters should be used:

- 40,000-5-Day Old larvae should be inoculated per one square metre treatment area and fed 60kg of biowaste over a period of 12 days.
- Adding too much organic waste to feed the larval shell should be avoided as this can lead to temperature rise and can result in undesirable conditions in the larval especially with production of anaerobic gases which are harmful to the larvae.
- On the other hand, providing inadequate waste will starve the larval shell and, thus, reduce their development rate.
- The maximum depth for waste in larvero is 5-10 cm.
Water quality issues and tobacco seedling production

Water quality

Introduction

WATER is an essential resource for crop production. It not only provides the necessary hydration for the plants but also serves as a carrier for nutrients and agrochemicals. However, not all water sources are suitable for irrigation purposes as water quality can vary greatly, depending on its origin and treatment method.

Water quality?

Water quality refers to the physical, biological and chemical characteristics of a water supply that determine its suitability for a specific use, i.e., how well the quality meets the needs of the user. In irrigation water, emphasis is placed on the chemical and physical characteristics of the water such as pH, alkalinity, conductivity, and hardness.

The production of high-quality tobacco seedlings, both in the conventional and float system requires a reliable and safe supply of water. In the past, water quality was not a major concern due to the abundance of clean water sources. However, with the increase in urbanisation, industrialisation, agricultural runoff, and climate change, many water sources have become contaminated. As a result, farmers are often forced to use poor-quality water, which can have negative effects on seedling growth and health. Therefore, the quality of irrigation water is a key factor that needs to be established when selecting a source for seedling production.

Importance of establishing water quality

Using poor-quality water in seedling production can pose a wide range of problems that include excess accumulation of soluble salts in the seedling growing media or water leading to seedling salt injury (Fig. 2A). Seedlings affected by salts will exhibit symptoms that include leaf chlorosis and necrosis — causing the characteristic “burn” (Fig. 2B) and cupping margins (Fig. 2C). In other instances, the water may be contaminated with pathogens such as Pythium and nematodes which cause seedling root diseases to develop. High alkalinity water can also affect the availability of certain nutrients, which can stunt plant growth and yield. Moreover, excess chloride in irrigation water can cause severe damage to tobacco plants. Overall, the use of poor-quality water may result in seedling death and/or the production of poor-quality seedlings. Therefore, the quality of water used in seedling production must be carefully managed to minimize these risks and maximize returns on investment in crop production.

Figure 2: Effects of excessive salts on tobacco seedlings: (A) death of seedlings, (B) leaf tip burn and (C) leaf cupping as indicators of unhealthy plants. Photo credit: Kutsaga Research.

Collecting water samples for testing

It is important to collect water, which is representative of the water that is applied to the seedbed during the production season. The following guidelines should be considered seriously:

a) Choose a point that represents your irrigation water source. For instance, in an existing irrigation scheme, water may be collected from the nearest inlet or outlet pipe to ensure a representative sample. Similarly, in the case of an open dam, water samples may be collected just beneath the water surface to obtain a more representative representation of the water quality.

b) Use a clean glass bottle, which has been thoroughly washed and rinsed several times with the water to be analysed (Fig. 3).

c) Collect about two litres of water.

d) Water quality varies significantly during the season due to the amount of rain that falls so it is advisable to sample the water just before irrigation starts.

e) If analysis of iron is required, two samples should be taken; one near the water surface and one at a greater depth, as iron concentration varies with depth.

Figure 3: Water sample collection from a river

What can one do if analysis results show poor quality water?

Growers should follow treatment recommendations provided in the analysis report which are often physical or chemical water treatments. In extreme cases, a water source may be deemed unusable for irrigation and its use may have to be discontinued. In this case the grower should investigate the possibility of using a different water source or alternatively mixing different water sources.

Conclusion

Ultimately, testing water before using it for seedling production is the best way to avoid producing poor-quality seedlings. By taking the time to collect and test water samples, growers can ensure optimal growing conditions for successful seedling production.

Chinamo is a soil scientist with TRB

Ensuring Quality

Free Range Poultry and Products for Local, Regional and International Markets through National Standard ZW1051:2022

The Zimbabwe Free Range Poultry Association (ZFRPA), over the past months has been working in partnership with the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development (MOLAFWRD), the Standard Association of Zimbabwe (SAZ) and technical experts from the industry to develop a national standard for the production and marketing of free range poultry in Zimbabwe. This national standard focuses on all what is known as “backyard poultry” or better known as the free range poultry namely; chicken/roadrunners, turkey, duck and guinea fowl but also takes into consideration the health consciousness and animal welfare concerns which now are seriously being upheld by consumers and customers world over. The National Standard was launched by the Honourable Minister of Lands, Agriculture, Fisheries, Water and Rural Development on the 27 June 2023 during a physical meeting of free range poultry stakeholders and actors held at Harare Exhibition Park/ Harare Show Grounds, Robbie Mupawose Hall.

The National Standard ZWS 1051: 2022, gives guidance and ensures sustainable production, management, marketing and record keeping of free range poultry by all free range poultry farmers and stakeholders in Zimbabwe. This therefore leads to standardisation and certification of the quality of free range poultry and free range poultry products as good agricultural practices are specified in the national standard. This then gives scope for commercial production, certification and marketing of the Free Range Poultry and Poultry Products targeting the more confident and greater niche markets including the export markets. Implementation of this National Standard by all free range poultry farmers will go a long way to ensure the credibility and sustainability of the free range poultry sector.

The Zimbabwe Free range Poultry Association in partnership with SAZ and MOLAFWRD invites all like-minded free range poultry farmers, development agencies, UN Agencies and government departments to join hands in the awareness creation, training of users, dissemination of the National Standard contents and ensuring implementation of the set standards.

For more information and interested parties should get in touch with:

ZIMBABWE FREE RANGE POULTRY ASSOCIATION (ZFRPA), Harare Exhibition Park, Harare Showground, 4th Avenue/ 3rd Street, Opposite NSSA Stand Harare, Zimbabwe

Mobile: +263784335019/+263779600730

Email: admin@zfrpa.co.zw, or biij@zfrpa.co.zw, biij@gmail.com

For information and interested parties should get in touch with:

The National Standard can be bought using the applicable rate for the day when making payments in ZWL

For more information and interested parties should get in touch with:

ZIMBABWE FREE RANGE POULTRY ASSOCIATION (ZFRPA), Harare Exhibition Park, Harare Showground, 4th Avenue/ 3rd Street, Opposite NSSA Stand Harare, Zimbabwe

Mobile: +263784335019/+263779600730

Email: admin@zfrpa.co.zw, or biij@zfrpa.co.zw, biij@gmail.com

Figure 1. Tobacco seedling sowing using good quality water in the (A) conventional system and (B) float tray system. Photo credit Kutsaga Research
Tobacco seedling production

Dr Susan Dimbi

Choice of site
The ideal location is a warm, north or north-west facing sloping land, because it is less exposed to the sun and more protected from the cold prevailing winds in winter. A boundary fence (hatch) is recommended as it protects the site from wind and minimises incidences of ground frost. The site must have good surface drainage and an adequate, reliable water supply. The site should not be near tobacco handling facilities such as grading or storage sheds to avoid contamination by tobacco trash. This applies to both conventional and float seedbed sites.

For conventional seedbeds, fertile, well-drained sands, loamy sands and light sandy loams are the most suitable soils. Heavier-textured soils are difficult to manage for seedling production. The site should be deep ploughed early for maximum decomposition of plant residues. Irrigation to facilitate this decomposition should be done and the site should be kept weed-free. Before sowing, the site should be fumigated using products as listed in the Flue-Cured Recommendations Handbook.

For the float tray system, choosing a more or less level ground will make bed construction easier, but some surface drainage is also important to keep the pathways dry. The bed dimensions must be such that upon floating, trays fit snugly in the bed and no spaces are left exposed, as algae will grow in the areas exposed to sunlight.

To obtain adequate, good-sized seedlings for each hectare to be planted, sowing must be done on 100 — 120 square metres of seedbed area if using the conventional seedbed and on 1 720 square metres when using the float bed system. Five grammes of seed are required for every hectare equivalent of seedbed area. The ideal seedling population is 450 — 500 seedlings per square metre in the conventional system.

Fertilisation
1. Conventional seedbed
One kilogramme of Compound 'S' (7 N: 21 P₂O₅: 7 K₂O: minimum S: 0.04 B) is applied to every 7 — 11 square metres, the higher rate being for sandy soils and the lower for fertile soils. The basal fertiliser should be carefully broadcasted and then incorporated into the upper 5 cm by a chopping action with a heavy-duty rake if a sand or grass mulch is to be used. However, if beds would be covered with either perforated plastic tents or the lightweight cover, the fertilizer should be incorporated into the upper 10 cm soil. A hoe is a suitable implement in this case. When the seedlings are 1 — 2 cm in diameter, the beds should be top-dressed with either 10 — 20 grammes ammonium nitrate of soda, or potassium nitrate, or calcium nitrate per square metre, or 5 — 10 grammes ammonium nitrate per square metre. For top dressing, the fertiliser is dissolved in water and the solution is applied just before the daily watering, which prevents the leaves from developing "fertiliser burn" symptoms. This application is repeated at least once seven days later on all late-ploughed sites and light-textured soils. Top-dressing the beds late in growth is not recommended, except when growth has been exceptionally poor.

2. Float-beds
Two types of fertilizers are recommended: Hydrofert and Kutsaga Floatfert. Fertiliser is applied at concentrations of 25, 50 and 75 mg N per litre of water in the bed at 7, 21 and 35 days after sowing, respectively. After six weeks from sowing, ammonium nitrate is applied at 100 mg N per litre of water. The fertilizer should be dissolved in water before adding to the float bed at regular distances along the bed length.

Draining water from ponds will induce shock in the seedlings and may result in early flowering in the seedbed or after transplanting in the field.

The ideal seedling
Seedling from the conventional system should have a stem 15 — 17 cm long and 6 — 10 mm thick, well hardened, should have produced no more than 8 — 10 leaves below the bud (including cotyledons), have a non-desiccated, strong, vigorous root system. Float seedlings are generally smaller with a stem length of 10-12 cm and about 6-8 mm diameter, however they survive better in the field because they have a more robust root system that minimizes transplant shock.

Uniform seedlings are critical for the production of maximum yield and quality tobacco. Left-over seedlings from an early planting are suitable for a later planting, provided they have been properly treated with some desiccants to avoid storage problems. The recommended practice is to sow the seedbeds 90 days before the intended planting date.

Agriculture Journal
ISSUE NO. 10 | JULY 2023 | TOBACCO

Figure 2: Effects of excessive salts on tobacco seedlings: (A) death of seedlings, (B) leaf tip burn and (C) leaf cupping as indicators of unhealthy plants. Photo credit: Kutsaga Research. (See story page 11)

Clipping
The removal of part of the foliage slows the growth of seedlings. It is a technique for improving seedling uniformity when they are relatively small (5 — 7 cm tall). Clipping enables the smaller seedlings to catch up with the bigger ones and when clipping is delayed, its less effective as a means of promoting seedling uniformity. Clipping may be necessary late in the seedbed phase if seedlings overgrow. Special attention to hygiene is necessary during clipping to avoid infection and spread of tobacco mosaic virus and other diseases therefore all clipping tools should be disinfected regularly.

Pest and Disease management
Regular inspection of beds to check for pest infestations is beneficial for early detection and management of most seedbed pests. The use of yellow sticky traps (Kutsaga Gnatbuster®) is an effective monitoring tool and should be used for the early detection of an aphid or fungus gnat infestation. Growers should also look out for cutworm damage especially during the hardening period. If any pests are detected, early treatment with the recommended agrochemicals will minimize losses.

Hardening
In both seedling production systems, seedlings should be hardened for at least 14 days and preferably 28 days before planting. Hardening is necessary to impart some degree of drought tolerance once seedlings are transplanted into the field. It also increases the carbohydrate content in the seedling and this is essential for early root development and growth. In the conventional beds, this must be done by stopping watering and only resuming when there is significant wilting before 10 am. At this point a single watering of 2-3 time the daily requirement must be done and the process repeated till pulling.

In the float-tray system, seedlings will naturally start to harden as soon as the fertilisers that would have been applied are used up and all nutrients are depleted. Thus, it is very important to add floatfert to the pond water as indicated in the instructions and it is advisable to always keep pond water levels at the recommended depth. Draining water from ponds will induce shock in the seedlings and may result in early flowering in the seedbed or after transplanting in the field.
Propagating mango and orange fruit trees

Introduction
FRUIT trees were the earliest source of food known to mankind and today horticultural tree crops such as mango (Mangifera indica) and orange (Citrus sinensis) have become cash crop commodities. In Zimbabwe mango and orange trees are grown for household consumption and commercially for the export market.

The Ministry of Lands, Agriculture, Fisheries, Water and Rural Development’s Department of Agriculture Research and Innovation is carrying out research on fruit tree production at Nyangwe. The main focus is on deciduous or temperate trees which include tropical and subtropical fruits which include apples, pears, peaches and cherries.

The Horticulture Research Centre (HDC) in Marondera carries out research on tropical and subtropical trees that can grow in warmer climates like low chill apples, oranges and pears. Coffee Research institute carries out research on Macadamia, avocado and pecan nuts. Lowveld Research Institute (LRI) in the South Eastern of Zimbabwe focuses on fruit trees that are adapted to the semi-arid regions.

Research findings at these centres generate information that assists in improving the farmer’s production and productivity (yield per unit area) in line with nation’s Vision 2030 objective of a prosperous and empowered upper middle-income society.

Extensive research has been carried out on adaptable fruit tree varieties as well as propagation methods that ensure the production of a large number of uniform and true to type fruit tree seedlings that are needed for the establishment of vast areas of fruit tree orchards that satisfies the demands for fruits both locally and on the export market.

Growing fruit trees from seed may result in the production of trees that produce fruits that appear or taste differently from the original fruit because of the biology of the tree in question.

Grafting and budding are two horticultural techniques that have been in use from as early as 2000 years ago in ancient China and Mesopotamia. Today these plant propagation methods are widely used for producing high yielding and uniform fruit tree seedlings by joining parts from two or more plants so that they appear to grow as a single plant.

Since grafting and budding are asexual or vegetative methods of propagation, the new plant that grows from the joined plants will be exactly like the plant it came from. In grafting, the upper part of a plant, which is called the scion, is a shoot that is joined to the lower part of a plant that usually has an established root system (the rootstock).

With budding, an actively growing bud called the scion is obtained by removing a bud from the parent plant and the base of that bud is inserted beneath the bark on the stem of the growing plant which is called a rootstock.

The rootstock used in budding and grafting is usually chosen for various reasons which might include their tolerance to pests and diseases, harsh soil conditions, soil salinity or the rootstock’s ability to dwarf or shorten the rootstock resulting in shorter trees that are easier to manage and carry out routine operations on like spraying for pests and diseases as well as pruning.

In Zimbabwe, trees that are most commonly propagated or reproduced by budding include orange, naartjie and lemon whereas mango, apple, blueberry, peach and pears are propagated by grafting.

This article will focus on Mango and Orange as examples of fruit trees that are adapted to semi-arid regions and have been extensively researched on at Chiredzi Research Station. The institute in presently increasing its capacity to support the Horticulture Recovery and Growth Plan (HRGP) by expanding nurseries and orchards.

Types of grafting commonly used in Mango

Whip grafting (Also called tongue or splice grafting)
This is done when corresponding cuts through the rootstock and the scion are joined end to end and then bound using grafting tape which is made of plastic with very fine pores. This method is used when the scion and rootstock are approximately equal in size and the interlocking “tongues” provide structural support for the joint before the plant tissues heal.

This involves cutting the root stock across the stem and then splitting the cut end. One or more scions is then inserted in the split. This type of grafting is mostly used when the rootstock is bigger than the scion.

Cleft grafting
In all types of grafting, it is important that the plant vessels merge to allow the continuous flow of water and nutrients from the root stock to the scion. Mismatched plant vessels often lead to grafting failures.

Differences between grafted and non-grafted trees
Non-grafted trees usually exhibit fast vegetative growth and can grow very tall. In contrast grafted trees are usually shorter because the rootstocks used usually have a dwarfing effect. Non-grafted trees have no joint since they are made up of one plant whereas grafted trees have a joint which has to be looked after because if the joint breaks the tree which produces the fruit the farmer is interested in will die.

Non-grafted trees take a long time to produce fruit (up to five or eight years for mangoes) since they have a long juvenile stage whereas grafted trees can bear fruit in one or two years after planting. This is rapid fruit production is due to the fact that the scion wood is taken from a plant that will have reached its reproductive stage.

Management of newly grafted trees
- Clearly label trees to maintain the varieties before they come into bearing
- Pest and disease control management and control (prophylactic spraying of fungicides)
- Keep the plant moist all the time
- Provide 50 percent shade
- Check if the union has been established
- Removal of the side shoots from the stock
- Remove the grafting tape when the trees take off
- Protect the trees from direct rains

Cleft grafting

Whip or tongue

Splice

Trainin in Pig Production- A Worthwhile Investment

A stockperson is the backbone of a pig production enterprise and is key in enabling profitable pig farming. With that in mind PIG INDUSTRY BOARD will be running one day theory courses at its station in Arcturus and at a venue to be confirmed in Bulawayo. At the end of training participants will play a better role in improving productivity.

For your Diary: Upcoming Courses in 2023

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<td>Basics on pig production for beginners</td>
<td>23/11 (Arcturus)</td>
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<td>For finer details and bookings : 0772234650 (Arcturus)</td>
<td>0772517935 (Bulawayo)</td>
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</tr>
</tbody>
</table>
From Page 13

these materials are slightly porous to allow oxygen in to the graft union. The grafting tape is then wrapped firmly above and below the bud and then less pressure is used to wrap over the bud.

The tape will create a greenhouse-type environment with high temperatures and this will help the healing process. It takes about two months for the bud to heal after which the tape is carefully removed. Any shoots growing below the graft union should be cut off as soon as they appear so that they don’t compete with the main shoot.

T budding

The best time to bud is soon after winter when trees are preparing to produce new shoots. Budding should be done when the bark is succulent and in “slipping” condition. When cut, the bark easily lifts or peels in a single uniform layer from the underlying wood without tearing.

The exact time when this occurs depends on soil moisture, temperature and time of the year. Dry very hot weather can shorten the period of bark slipping. Irrigation can be very valuable in extending the T budding season. Buds should not be inserted when temperatures exceed 32°C.

Mhazo is head of Lowveld Research Institute under the Department of Agriculture Research, Innovation and Development. He is a holder of a Masters Degree in Crop Science (MSU).
Manhada writes history with discarded freeze-it plastics, avocado and lemon seeds

Edgar Vhera

EMPTY freeze-it plastics and rootstocks of avocado and lemon seeds. These three form the core of Standreck Manhada’s requirements to successfully establish a nursery of fruit trees.

While the generality of Zimbabweans litters the landscape with empty freeze-it plastics, avocado seed and lemon peels alongside the seeds, Seke-based Manhada produces make-shift greenhouses from the discarded plastics and rootstocks from the avocado and lemons rubbish.

A former soccer football trainer and coach turned forester, Manhada lives in Manzanda Village of Ward 8 in Seke district of Mashonaland East. He is married to Constance Tapera. The couple has three girls aged 23, 17 and 10.

His fairytale started in 1997 when he established Savanna Nursery with the help of his wife. The project was born out of their love to keep trees. It was not long before Manhada also started experimenting with gum trees.

“I had deep love for trees and so I started collecting different seed types to nurse them whenever they requested for them. When demand grew, I realised that there was value in the project and started selling the seedlings.”

“I also started supplying schools and community projects in Seke with gum seedlings. For 10 years, I supplied Manyame Rural District Council with seedlings,” said Manhada.

Lady Luck smiled on Manhada when his Savanna Nursery was contracted by Maronde-based tobacco company, Kelvidge to supply farmers with gum seedlings for the establishment of plantations. The nursery also secured a similar contract with Sustainable Afforestation Association (SAA) and that saw its fame grow like a fire in the Harmattan in the three years that followed.

The nursery’s exploits did not escape the notice of the Forestry Commission, which duly came on board and placed orders for gum seedlings in 2000.

“Forestry Commission awarded me a big contract to supply 500 000 gum seedlings in the 2002/2003 season. As I did not have enough space to meet such an order, I secured extra land from Matambanadzo Village near Nyatsime River but things did not go according to plan with Forestry Commission later absorbing only 150 000 seedlings leaving me stuck with the 350 000 extras,” explained Manhada.

Manhada, however, turned the setback into an opportunity to expand investment and research into fruit tree budding and grafting.

“We have since expanded our business to lemon, oranges, avocado, mangoes, grapes, strawberries among other seedlings. We are increasing the scale of production to meet more customer needs. We produce an average of 200 000 assorted tree seedlings annually, some of which we distribute free of charge to local schools and individuals,” he said.

They produce seedlings of lemon (Eureka and rough), mango (Alwin heids species), grapes (Esso black species), strawberries, oranges (Washington navel, delta valencia, Bayiere), guavas (white and red), pine (partula, causalina for timber and windbreak purposes), avocado (Pingoton, Suerte, Hass, Malmore) and nartjies (clementine,sansuma, elendale and imbala).

Manhada has 15 000 rootstocks of lemon, avocado and mango in stock with a further 2 000 and 1 000 oranges and nartjies respectively that have been produced through budding.

Savanna Nursery makes use of the rough lemon rootstock to produce hybrid lemons like Eureka and hybrid oranges like Washington navel, as lemons and oranges are well-suited to each other. They get rough lemon seeds to use as rootstock for free from a fast-moving restaurant in Harare that process the lemon fruit to extract fluids used in making soups.

“We employ people who go to Jambanja and Mbare fruit and vegetable markets to collect avocado seed. We pay US$5 per bucket. We started seed collection in April and have accumulated about 5 000 seeds that we have planted in black plastic bags,” said Manhada.

The tree-talking Manhada revealed that they collect empty used freeze-it plastics from areas such as schools’ sports days, football matches and churches where people gather in numbers.

These plastics serve as greenhouses to enhance the growth of the buds, as well as protect the bud area from water that might cause rotting and development of diseases.

They make use of buds from the hybrid Hass mother stock they get from Shamva. An ordinary avocado seed is planted in a pot, it germinates and reaches the desired thickness. A Hass bud that has nodes with the same thickness as that of the rootstock plant is cut.

“Using the rootstock from picked avocado seed, I take the bud/stem from Hass that has nodes. Thickness of scion and rootstock must be the same. The rootstock needs a lot of water to feed the scion. I prefer the slice or cleft method, I open a V-shape and align the scion and the rootstock together,” explains Manhada.

“When joined together through either budding or grafting, the tissues of the budded plant are the same but the plant is now hybrid as the bud will change the cells of the ordinary plant. This occurs because the bud is from a mature plant that is already producing fruit. After a year the budded/grafted tree will be producing fruit.”

“My first batch has about 500 plants. I am delaying the budding process because there are some mother plants with fruits so we don’t cut them often. Next month when it will be cold, I will do 200 every month until I reach 1 000 plants.

Orange budding

An orange node is budded to a lemon plant to change the characteristics, tissue/cell of lemon from sour to sweet.

Future plans

Savanna Nursery intends to grow more trees to escalate the fight against desertification and the high rate of deforestation nationwide and thereby enhancing the climate change fight. This will help create jobs through educating all age groups to start nurseries and earn a living from the project.

Savanna Nursery is registered and holds a permit from the Ministry of Lands, Agriculture, Fisheries, Water and Rural Development.

Challenges

The main challenges remain that of lack of access to finance to procure shade cloth for young seedlings, planting bags, seed germination trays, washing trays, planting bags chemicals for control of pests and diseases, installation of greenhouse, irrigation infrastructure and germination rooms as well as working capital to pay labour.

Vhera is an agriculture economist and specialist writer

Used plastics act as greenhouse to speed bud healing

Mr Manhada fits scion into rootstock using the cleft method

Mr Manhada wrapping the scion and rootstock with budding tap

Mr Manhada watering his mango seedlings
An example of good compliance to the destruction of the tobacco stalks and roots destruction in Mashonaland West Province.

Tobacco stalk destruction and the May 15 deadline

Introduction

THE “Plant Pests and Diseases (Tobacco) Regulations Statutory Instrument 711 of 1979” as amended, was created to reduce incidences of pests and diseases in tobacco crops, especially the viruses that are vectored by aphids, white flies and thrips. These viruses may result in the production of poor-quality leaf.

The insect vectors transmit the viruses during their feeding from one crop to another and from one season to another. The viral diseases of importance include tobacco bushy top virus (TBTV), tobacco streak virus (TSV), potato virus Y (PVY), tobacco leaf curl virus (TLCV), tomato spotted wilt virus (TSWV) and cucumber mosaic virus (CMV).

The wide host range of such diseases like TLCV, CMV and TSWV ensures numerous natural hosts of the virus in which the virus survives and from which it can be spread by the vectors.

Depriving the insect vectors of their host (tobacco) is the most effective way of controlling the multiplication of the vectors. Plant health inspectors from the Plant Quarantine Services Institute (PQSI) in collaboration with other stakeholders enforce these tobacco regulations.

Tobacco legislation enforcement addresses the regulatory compliance and quality assurance objective of the Research Services Department which seeks to have an improved compliance to agricultural regulations and hence an improved crop management.

The set target is to achieve at least 80 percent compliance to the tobacco stalks destruction so as to reduce risk of pests and disease outbreak to protect tobacco plant health and improved market access in trade facilitation.

The country needs to maintain its cash crop markets by protecting tobacco plant health with a target to achieve at least 80 percent compliance with stipulated tobacco regulated cropping calendar. Achieving at least 80 percent stalk destruction in the country is the bench mark that ensures meeting the objective to reduce carry of these pests’ threats from season to season.

The regulation stipulates that by May 15 each year, no live tobacco plants must be found growing in any field in Zimbabwe. This procedure ensures that a tobacco free period is created between May 15 and August 31 in any field creating no food for the vectors that spread the viruses of concern.

The law also stipulates that there is no sowing of tobacco seeds into seed bed before June 1 every year. The science behind this is to create a dead season where vectors of the tobacco are killed through depriving them of food.

We are killing these insects by hunger and hence their populations is highly reduced.

Extension for the growing period for tobacco can be granted by the PQSI in consultation with the Director of the Regional Crop Protection Officer as the growers control have delayed completion of the cropping season. All applications for an extension of the cropping season should be submitted to the Director or the Head responsible for the PQSI at least two weeks prior to stipulated regulated date.

Just before the May 15 deadline for tobacco stalks destruction, the fields are always free of visible live tobacco plants yet from June to July, a lot of live tobacco is seen growing in the fields. The question is why?

The destruction of tobacco plants requires the land owners and tobacco stakeholders to uproot the crops from the field using any means whether reapers, hand hoes or whatever means to ensure complete death of the plants. This destruction method must ensure that the crop is not capable of re-growing. The observation of the procedure has been done very well by farmers.

A serious case of non-compliance due to regrowth in Mashonaland Central Province.

Restrictions of market access to tobacco products requires the land owners and tobacco stakeholders to uproot the crops from the field using any means whether reapers, hand hoes or whatever means to ensure complete death of the plants. This destruction method must ensure that the crop is not capable of re-growing. The observation of the procedure has been done very well by farmers.

Of late, the buyers of tobacco crop had gone a bit further in promoting farmers work by allowing them to harvest some of the regrowth that occurs just after harvesting. The idea was meant for only the germinating propagules before the May 15 deadline. However, due to this lucrative deal profited by the buyers, a lot of the farmers are now just cutting the stalks in a way to cause a regrowth and hence resulting in a false compliance which is only noticed after the deadline has long passed. A number of land owners or growers have been fined due to the presence of such re-growing tobacco in the fields.

It is important for the country’s market access to be safeguarded and this is the basic measure required to meet phytosanitary requirements for market access and trade of the commodity.

Pest infected tobacco products are not marketable and hence the observation of these phytosanitary measures is critical for the country’s market access, trade and the protection of the industry from pests and diseases.

While the plant health inspectors may cause non-complaint stakeholders to pay fines as a measure to enforce compliance, the best way forward requires all stakeholders approach to safeguard the tobacco leaf industry as previously discussed in the tobacco indaba.

Mudada is head of the Plant Quarantine Services Institute. He holds a MSc Crop Science, BSc Crop Science, BSc Monitoring and Evaluation. Certificate in Pest Risk Analysis and several short courses in Phytosanitary and Plant Health.