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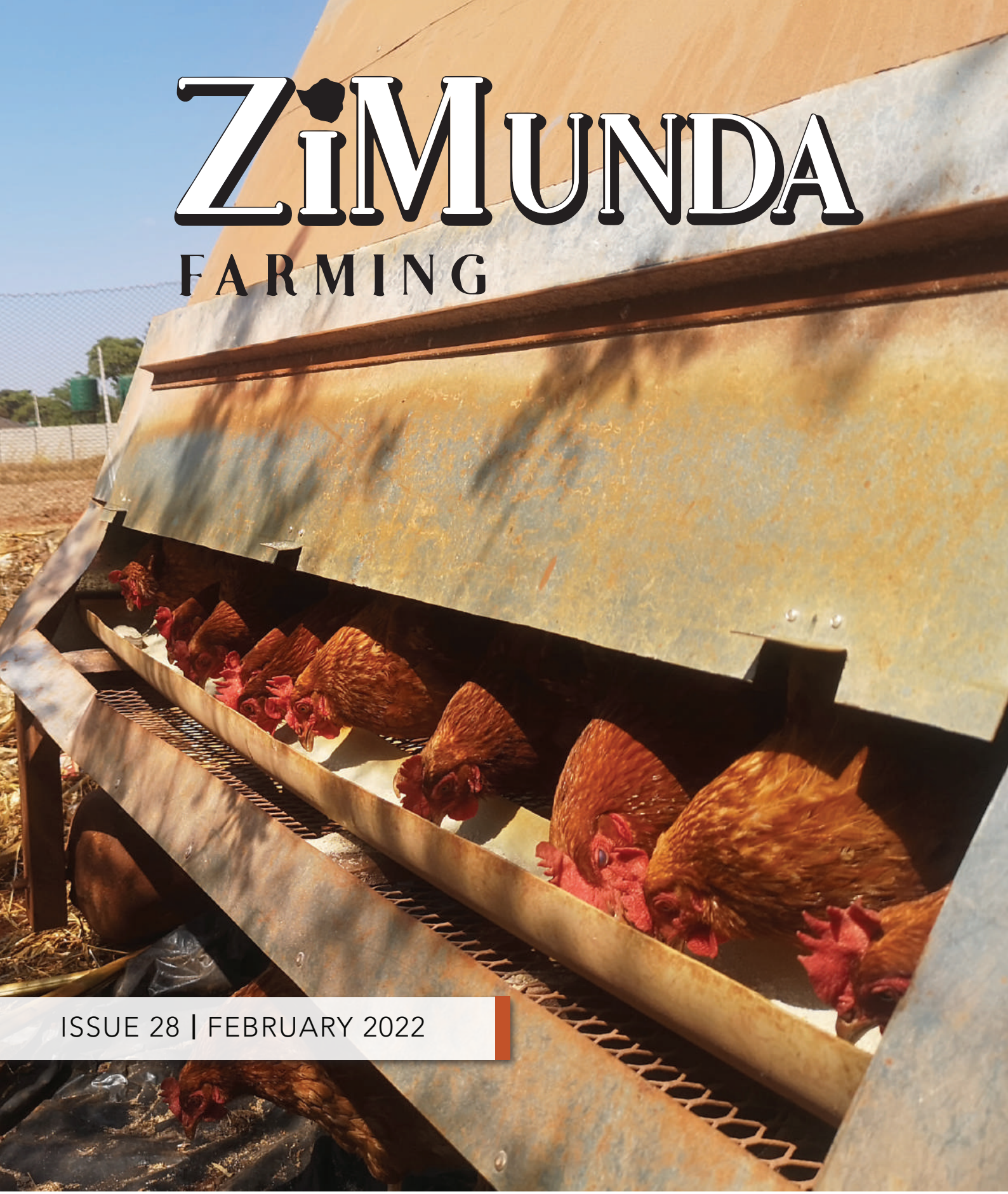

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COVER

Layer chickens at Foundations for Farming, Glen Forest.

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MATURITY IN DAYS	190 - 200	
PLANT CHARACTERISTICS	Bulb: Shape	Deep flat round
	Firmness	Moderate
	Exterior colour	Medium straw
	Interior colour	Cream white

DISEASE TOLERANCE *Pyrenochaeta terrestris*

Onion - Capricio | KKS1402

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DISEASE TOLERANCE *Pyrenochaeta terrestris*

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Farming God's Way

By Foundations for Farming

Foundations for Farming is an initiative aimed at bringing transformation to individuals, communities and nations through faithful and productive use of land. God has revealed a very simple conservation farming method with an implementation management teaching, which when applied helps people to apply the Gospel to their lives.

A TOUCH OF HISTORY

Foundations for Farming (FfF) started in 1984 when the farm that the founder Brian Oldreive was managing in northern Zimbabwe, Hinton Estates, was nearing bankruptcy. Burning and deep soil inversion were common practice on the farm causing terrible sheet erosion to occur resulting in loss of seed, soil and moisture. Increasing amounts of money were being spent on the machinery required for ploughing and clearing crop land, and yet the yields were declining.

Being a man of faith, Brian asked God to reveal a way for him to get out of the dire situation he found himself in. God began to reveal to him that in natural creation there is no deep soil inversion and that a thick 'blanket' of fallen leaves and grass covers the surface of the soil. This led him to research how he could apply these ways of nature to his farming. He began to experiment with Zero-Tillage using a simple hoe on two hectares of the farm at the highest standards possible. The results were outstanding, and so he had the faith to increase the hectarage under Zero-Tillage. Within six years the whole farm of 1,000 Ha was under minimum tillage and in subsequent years, due to the yearly profits from then on, other farms were bought and he oversaw the farming of 3,500 Ha. Brian set a national maize yield record on the hand planted area of the estate that stood for twenty years and won maize grower of the year, soya grower of the year and several other accolades during the '90's. With a proven track record of success since 1984, Brian sought to advocate for the success of the farming principles and equip small scale farmers to achieve sustainable profitability. Using the principles that Brian had perfected at scale a team of Zimbabwean farmers collaborated under the banner of Foundations for Farming to refine Brian's vision and create an applicable model for food security and profitability in rural communities. This unity of vision and focus resulted in the creation of the Pfumvudza concept to feed a family for one year.

THE PFUMVUDZA CONCEPT

With most rural farmers in Zimbabwe working up to two hectares of land every year, but still unable to produce an adequate supply of food to sustain themselves, many believe

that the answer is to either farm more land or to mechanise. Unfortunately, neither of these options work as larger land means even lower standards and no increase in production and mechanisation is generally out of financial reach for most families as it also comes with many hidden costs (repairs, maintenance, fuel etc). To address this problem using FfF principles, the Pfumvudza concept was developed to answer the following question "How much land is required to feed a family for a year"? Following intensive trials, a model was developed assuming that a family would require a bucket of maize per week to provide for their staple diet. Employing the FfF farming principles (minimal soil disturbance, mulch application, mixed cropping and high management) and using the Pfumvudza input pack (exact measurements of seed, fertilizer, top dressing and a step-by-step how-to brochure), it is possible to feed a family for a year from a piece of land measuring 1/16 Ha (39m*16m) and minimum investment (Guiding Principles of Pfumvudza, ZiMunda Farming Issue 10).

FEEDING NATIONS

Since the initiative is aimed at bringing transformation to individuals, communities and nations through faithful and productive use of land, the organisation has since spread to other countries with the hope and desire that the recipients of the knowledge will implement what they have learnt and transform lives in their countries so as to eradicate hunger and poverty through farming. With the head office stationed in Zimbabwe, FfF is now present in Canada, Mexico, South Africa, Zambia, Malawi, Kenya and India.

For more information visit
www.foundationsforfarming.org

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Going Beyond Pfumvudza as We Know It

By Vimbai Ruvengo

Farming systems are perceived as human activities that are managed for the **purpose** of food production and income generation. The Foundations for Farming (FfF) organisation created the Pfumvudza concept to address the household requirements of small-scale agricultural systems in which the farming is in accordance with the household's goals (to produce staple food and earn income) with limited resources. With this in mind, the organisation has developed an integrated web of a food production system that supports the ecological sub-system on farms, the economic sub-system and increases household wellbeing and resources e.g., firewood that is an additional benefit to the Pfumvudza concept.

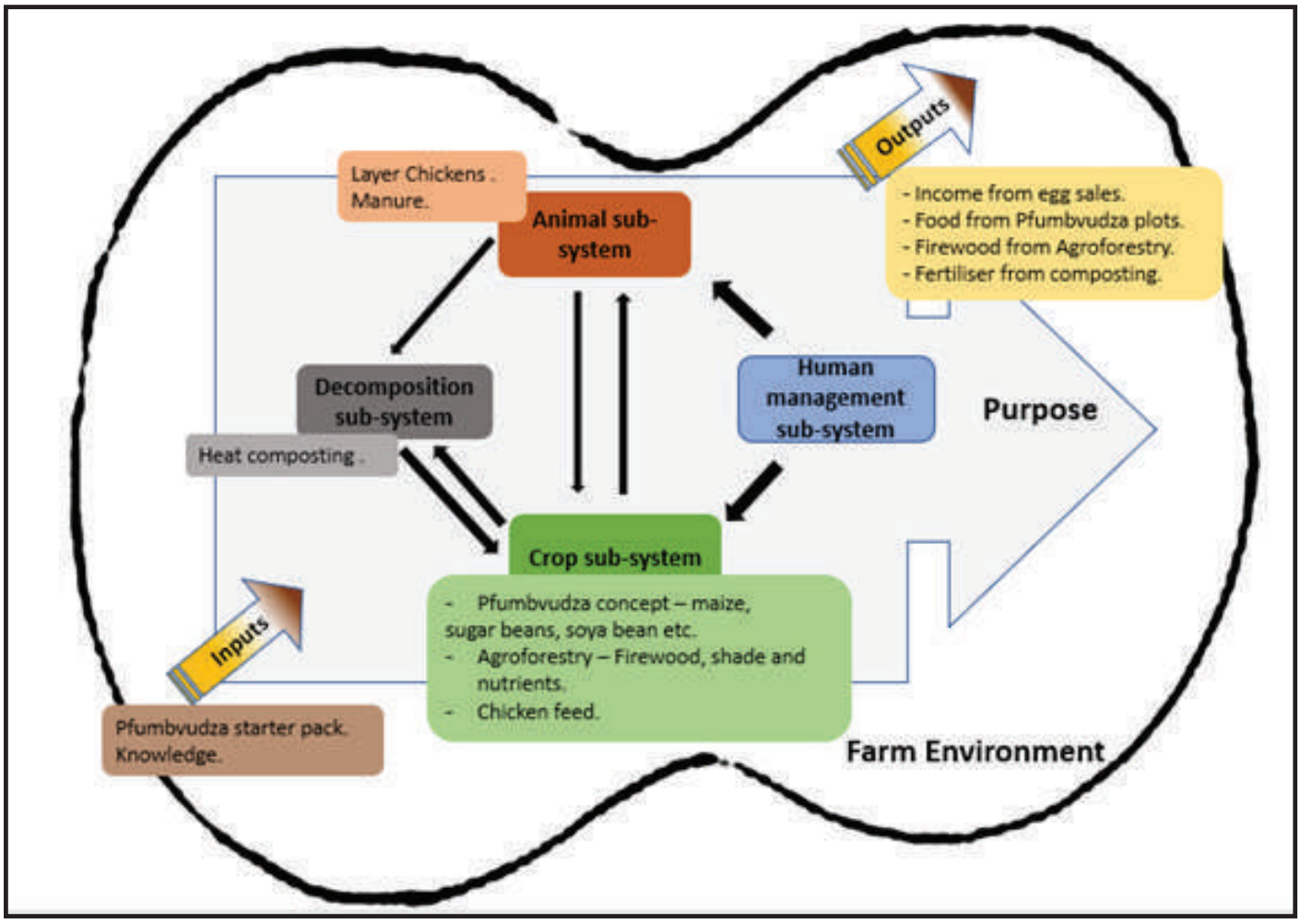
THE FARM ENVIRONMENT

The unique and reasonably stable arrangement of farming enterprises managed by farmers are according to the well-defined practices set in response to the physical, biological and socio-economic environments (outer peanut shaped line of the model). These factors combine and influence output and production methods. The integrative practices by FfF of the food system encompasses ecological, economic and social dimensions and has brought about a generic design for farms using the principles that are demonstrated using the Pfumvudza model.

THE CROPPING SUB-SYSTEM

According to FfF, the cropping/autotrophic sub-system serves as the foundation or the gateway for other sub-systems. Farmers grow subsistence crops in the plots and vegetable gardens to complement their **staple food.** The **vegetable garden** is encouraged to be planted in a staggered sequence, for example if the tomato bed is made for 20 plants, they should be planted in five batches of four plants at a time with a difference of two weeks so that production is staggered and the household does not lack tomatoes at any given time. The vegetable garden can be complemented by herbal species such as lavender, rosemary and comfrey which provide **Integrated Pest Management** strategies.

A revised version of the Hawkesbury's Peanut Model showcasing aspects that describe the internal sub-systems in subsistence farming as employed by FfF. The illustration is inspired from the work of agroecologists Bawden and Packham (1993) (By Author).



A healthy and diverse Pfumvudza vegetable garden.

With the inputs included in the Pfumvudza starter pack developed by Foundations for Farming over the last ten years, farmers can grow one plot of maize and another of soya beans. These two plots will **produce** enough feed for 20-layer chickens for the whole year. The chicken droppings are collected for compost that can be added to the fields as fertiliser or can be used to produce chicken manure soup (fertiliser tea) that can be poured onto plants with a watering can as a top-dressing.

The system design integrates intercropping in terms of Agroforestry or **alley cropping.** Alley cropping is a specific practice in which fast growing trees or shrubs and agricultural crops are grown in alternate rows for forage purposes (prunings can be fed used as livestock fodder or used for firewood, nitrogen fixation (legumes), erosion control and shading in very hot areas to reduce the rate of evapotranspiration in the mulched plots. The trees that coppice or regrow after being pruned are cut back annually at crop planting time to prevent the shading of the agricultural crop. They then grow alongside the crop and are left to bush out after the crops are harvested so that they can protect the ground during the dry months.

An integrated system of free-range chickens, alley trees and 'maize crop' in one plot

THE ANIMAL SUB-SYSTEM

The animal/heterotrophic sub-system can be defined by a small chicken layer project that can be confined or employed in a free-range system. Instead of selling the produce from one Pfumvudza plot of maize and soya beans, this can be fed to the 20-layer chicken project which can produce 5000 eggs/166 crates of eggs per year, adding value to the yield of the Pfumvudza project.

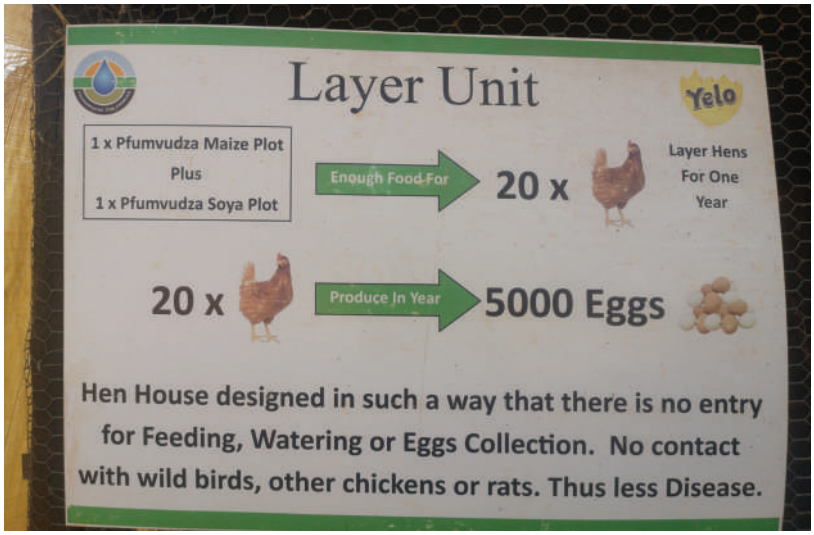
1. The 20-chicken Layer Model

The model hen house is custom designed for 20 layers in terms of space (density of birds per unit area). The basic requirements for poultry housing are:

Ventilation – because the hen house is made of bricks and mesh wire it allows for cross-ventilation at bird-level. Placement of the house should be in the open in a direction to allow the prevailing wind to blow across the width of the building.

Light - the building has ideal open sides (mesh wire) since light is important for feeding since poultry identify food by sight.

Protection – the brick and the metal roof protect the birds from the effects of the weather and predators.



Biosecurity – to reduce the incidence of diseases, the hen house is designed such that there is no entry for feeding, watering or egg collection.

2.The Free-range Model

Under free-range systems, roomy, clean and airy overnight shelter is provided. The poultry houses may be either fixed or mobile. At the FfF learning centre along Domboshava Road in Glen Forest, Harare, they provide the free-range layers with mobile housing designed by Darryl Edwards the Chief Technical Officer (CTO) of FfF.

The mobile chicken houses are equipped with mobile folds or field units for laying eggs, feeding troughs and water units that can be replenished from the outside of the housing. These mobile units are rotated on the range and the stocking density on pasture is calculated according to the pasture management system. The floor is raised with a mesh platform from the ground which has the advantage of providing ventilation under the floor, and helps cool the poultry in hot weather. The droppings can be collected onto a plastic sheet laid under the house floor for use in the cropping sub-system.

The free-range chickens forage for insects (pests) and eat leftover crops such as lettuce and other greens while at the same time fertilising the soil. This creates a symbiotic relationship between the birds and the land.

particularly by managing organic matter and enhancing soil biotic activity.
- Enhance beneficial biological interactions and synergisms among agrobiodiversity components thus resulting in the promotion of key ecological processes and services.

The organisation teaches farmers to add value to by-products of the cropping and animal systems i.e.,

manure and crop residues. The composting method employed at the centre of excellence is Thermal Compositing that is based on heat creation (refer to ZiMunda Farming issue 5 for the detailed article on thermal composting).

THE DECOMPOSITION SUB-SYSTEM

Through the use of manure, fertiliser teas, mulch and compost the decomposition sub-system designed by FfF aims to;

- Recycle biomass and optimise nutrient availability by balancing nutrient flow.
- Secure favourable soil conditions for plant growth,

HUMAN MANAGEMENT SUB-SYSTEM

The Profit-Making Principles of FfF are to do things on time, at a high standard, without wastage and with joy. With that in mind, the organisation's training hubs, or Stewardship Centres, the "Centres of Excellence," strive to equip individuals and communities with knowledge to be good stewards of the land, whether they have a backyard garden, or a commercial farm. In the FfF demonstration plots farmers, individuals, development staff and agricultural field officers get knowledge through hands-on training and other resources.

Equipped, inspired and armed with this knowledge, anyone willing to take a leadership role in their own lives and lead the agricultural revolution that is transforming communities around the world can go beyond Pfumvudza and rediscover the power and dignity of the Hurudza – the master farmer.

For more information visit : **www.foundationsforfarming.org**

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Hybrid Solar Systems and Net Metering

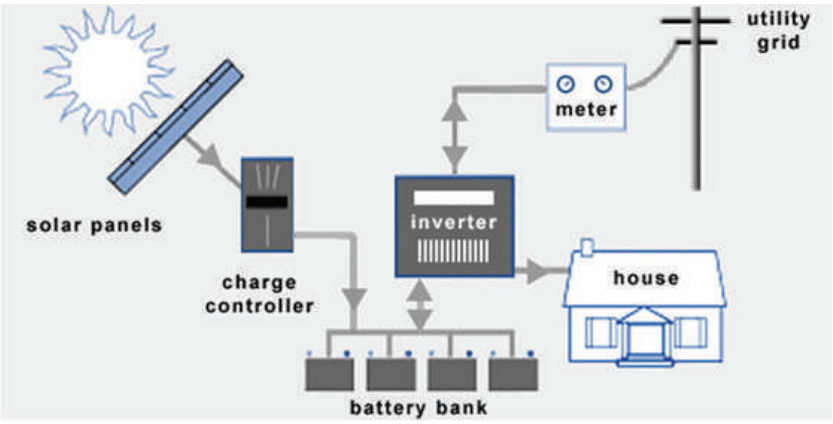
By ZiMunda Farming Magazine

Solar Energy Projects (SEP) is a leader in solar energy services and solar power provision. The company's in-house experience supported by world-class technology partners coupled with being fully capitalised with its own modern warehouse, vehicles and plant make it the Turn-key Engineering, Procurement and Construction (EPC) solar energy company of choice. SEP offers services in solar powered commercial irrigation (see ZiMunda Farming Issue 21) supported by three main types of solar power systems;

1. The **Off-grid** system is not connected to the electricity grid and operates independently of it. Therefore, requiring significant solar power production and battery storage for its autonomy. The system is designed appropriately so that it will generate enough power throughout the year and have enough battery capacity to meet the clients' requirements, even in the depths of winter when there is generally much less sunlight (see ZiMunda Farming issue 23).

2. The **Grid-tied** system does not have batteries but relies on a stable grid connection and uses either solar inverters or micro-inverters to reduce or eliminate grid power consumption during the day and export excess power to the grid for nighttime usage.

3. The **Hybrid** system with battery storage and a grid connection that can be used to power loads or replenish batteries when necessary. This makes for an economical and reliable solution.



Basic Layout Diagram for a Net Meter and Electricity Grid

A. HYBRID SOLAR SYSTEMS

Traditionally the term hybrid referred to two generation sources such as wind and solar, but in the solar world, the term 'hybrid' refers to a system which uses an inverter which can make use of a combination of solar power, batteries and interaction with the electricity grid.

How It Works

The hybrid system is a solar system which is connected to the grid and can use grid power to supplement the power generated by solar panels or stored in the battery bank. The main components in the system consist of solar panels, a charge controller, hybrid inverter and batteries. The system utilises a battery-based hybrid inverter which can draw electrical power from its battery bank, as well as the utility grid to power your loads.

Depending on the time of day you use electricity, your solar system can produce excess energy after filling up its batteries. Instead of this excess power not being made use of as you would in an off-grid system once the batteries are full, you can export it to the grid and be compensated for that electricity through an energy policy called Net Metering.

B. NET METERING

Net metering is an electric billing tool that uses the electric grid to utilise excess energy produced by solar power systems. Under net metering, the energy your solar panels can produce but you would not use is fed back into the national grid and is credited to your account. When you need to draw energy off the grid, you will be drawing on those credits to get electricity without racking up charges on your electricity bill thus making savings.

The Meter and Electricity Grid

Since the daily amount of electricity solar panels produce varies throughout the year: more in sunnier summer months, and less when the

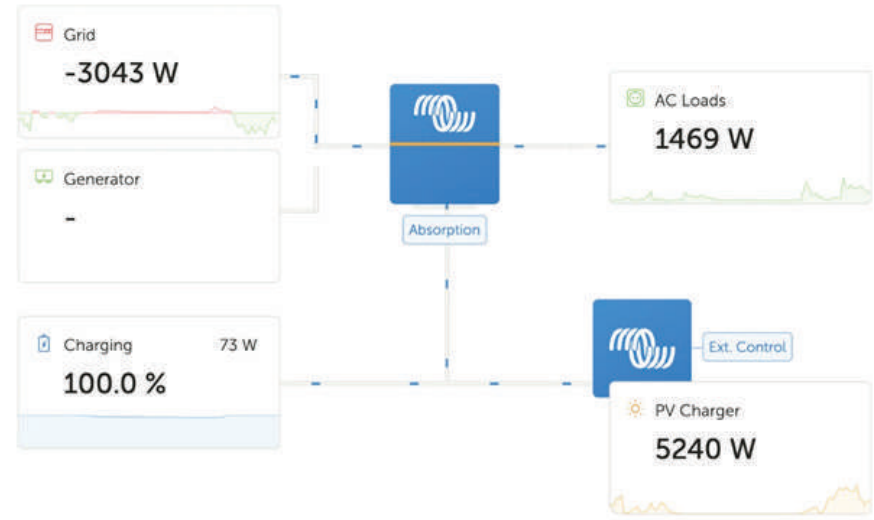
sun is lower in the sky and sets earlier in the winter. Net metering helps account for these seasonal differences in solar production by crediting you for the excess electricity your panels produce so that you can also use it at a later date. In essence, net metering is like having the grid serve as a giant solar battery you can charge with excess power while running your electric meter in reverse.

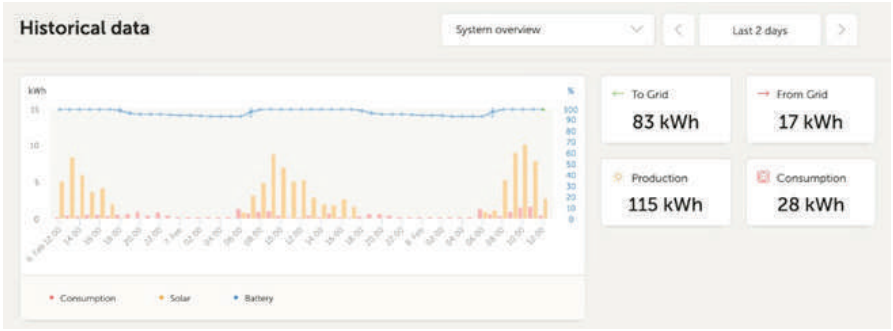
Grid-tying to ZETDC

The Zimbabwe Electricity Distribution Company's (ZETDC) has recently invited all stakeholders producing solar energy to participate in their Net Metering Programme. Successful applicants will be able to feed their excess power to the national grid in exchange for power units. These credited units will reduce the monthly Zimbabwe Electricity Supply Authority (ZESA) bill.

In 2019 SEP in conjunction with ZETDC successfully installed the first net meters in Zimbabwe. Commercial net meter number 00000000001, a 200-kW system with a 100-kW feed-in limit capacity. Domestic meter number 00000000001 followed, a 4-kW installation in Harare.

The team at SEP is proud of the meters so far and would highly recommend clients with solar arrays and Victron or Schneider inverters to benefit from this new initiative. As more Zimbabweans begin to feed into the grid, its capacity will increase and eventually load shedding will decline. This is a national cause and one can make a difference for a better Zimbabwe.





The graphs above showcase live reporting and monitoring from a client feeding back power to ZESA. During overcast days/rain or at night they can access the power they have fed to the grid and batteries remain full, acting as backup.

Advantages of Hybrid Solar Systems and Net Metering

-Reduced grid dependency as it can function as an off-grid solar energy system in case of power failure.
-Hybrid inverters come with backup power capacity thus providing uninterrupted power supply. It allows consumers to draw power from the grid, battery or solar.
-It enables self-energy provision with solar panels and battery backup, with the added safety net of being connected to the electricity grid
-Provides control over electricity bills by reducing electricity bills when excess power is fed to the grid and reduces the electricity bills.
- Most systems currently discharge their batteries and recharge them the next day with excess solar power which uses up the battery cycle life faster. With a net meter, you can double or triple battery life due to reduced cycling (see ZiMunda Farming Issue 22).

A hybrid solar system combines the best of both worlds' off-grid and grid-tied systems: the convenience of a grid connected system with savings from Net Metering, with the extra peace of mind of a battery backup. Where possible, tapping into the utility grid for electricity and energy storage is significantly more practical than using battery banks and/or backup generators.

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Precision Agriculture - The New Normal

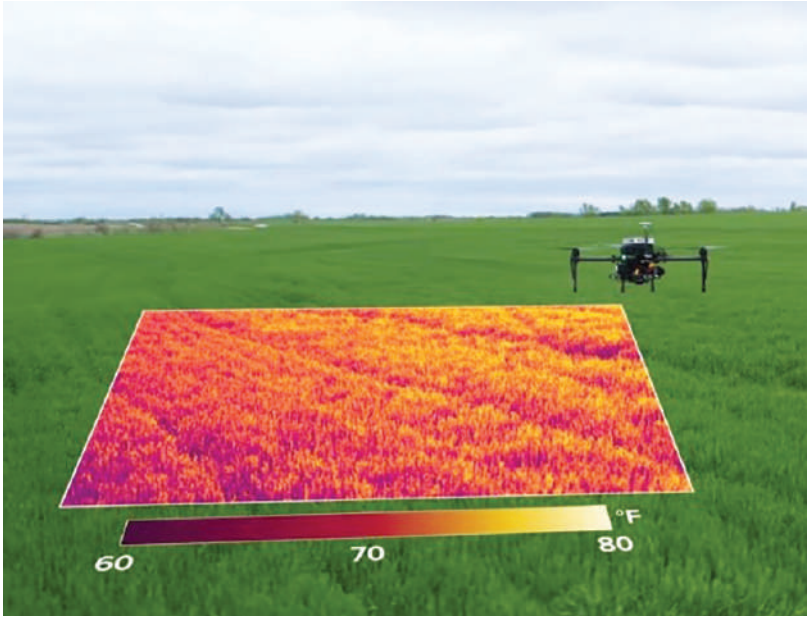
By Tinodiwanashe Mawire

In the recent past there is increased focus on the release of information presenting the most innovative results emerging from research in the field of precision agriculture for both small-scale farmer practises as well as commercial farmer practices.

Precision Agriculture (PA) is described by McBratney, et. al (2005), in their book Future directions of Precision Agriculture, as a farming management concept based on observing, measuring and responding to inter and intra-field variability in crops. This definition was then simplified by Mr Schmaltz the CEO of Decisive Farming to everything that makes the practice of farming more accurate and controlled when it comes to the growing of crops and raising of livestock.

In the systems approach, PA is regarded as a way of thinking beyond specific technologies where the practice focuses on adapting and adopting to the constant changes that the world is experiencing. In which this consequently allows for better management of both spatial and temporal variabilities of production on the farm through scheduled and spot application of inputs resulting in sustainable food production. Because of the variability in technologies of employment in the farming practice, some of terms that used together with this concept are Precision Agronomics (combining methodology and technology) and Site-Specific Management (the management of agricultural crops at a spatial scale smaller than that of the whole field).

Use of multi spectral imagery for crop monitoring



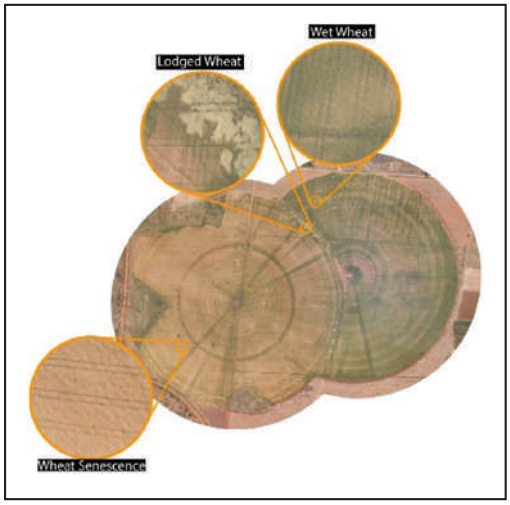
CROP MONITORING

Through monitoring crop status, by measuring variables such as soil conditions, plant health, fertiliser and pesticide effect, irrigation and crop yield, decisions are then made informed by facts rather than umbrella applications that do not take into consideration the variables in the field. By making such informed decisions, adoption of PA results in:

- Enhanced input use efficiency.
- Reduced environmental impacts such as leaching of unused nutrients which leads to eutrophication (pollination of water bodies).
- Irrigation efficiency.
- Labour use efficiency (reduced labour).
- Efficient use of time.
- Increased farm profits and production quality by reduction of input costs.

ADOPTION OF PRECISION AGRICULTURE

PA is not a one size fit all concept, but one that requires gradual approach, in consideration of the resources that one is exposed to. Application of PA concept can be a balanced soft or a hard approach based on the needs and specific socioeconomic conditions of the specific country, which makes PA not only suitable for developed countries but also for developing countries. Simple technologies like conservation farming, **(Pfumvudza),** that encourage principles of timeliness, high standards and reduced wastage are also part of the PA concept adoption.



Field mapping for crop harvesting forecasting

LAND PLANNING AND PREPARATION

PA should be embedded into the farming systems in the planning phases by starting with proper land use planning. The concept of land use planning is the foundation of all systems of PA for any farming endeavour no matter how small. Land use planning will help determine the suitability of your land for the different enterprises of the farm and it also include aspect like soil profiling and topography analysis which will ensure the right crop is placed in the right place.

Soil preparation for planting is critical for establishing the appropriate tilth that allows good crop establishment, impacting on the final yield. A well-prepared soil facilitates correct planting depths, good soil seed contact and correct seed spacing, all impacting the yield of the crop. Timeous land preparation will also mean timeous planting. Research has indicated that delaying to plant maize by a week reduces yields by 5%. Precision in timing of planting can be increased by the availability of irrigation.

CROP WATER MANAGEMENT

A precise assessment of crop water requirements is the first step in ensuring that adequate water is applied to the crop. Over irrigation and underirrigation are equally damaging to the crop and the environment and should be avoided. Precision agriculture entails that a farmer should select an irrigation method or system that supports crop requirements, minimises water loses while supplying water uniformly across the field. The introduction of technologies like drip irrigation, centre pivot and microjet systems are examples of technologies that farmers should adopt in ensuring precision irrigation management. Furthermore, one may also be able to schedule water supply with fertilisation to avoid loses through leaching.

PRECISION IN FERTILISATION

Precision in fertilisation starts with the selection of the correct plant nutrients required to support the growth of a selected crop. Soil sampling and analysis should be the first step, as this will help determine the soil nutrient status as well as the soil type. A combination of soil analysis data and the prescribed requirements for the particular crop will result in the application of the right fertilisers in the right quantities at the right time and at the appropriate crop stage. Application of fertilisers at the wrong growth stages promotes inefficient utilisation of nutrients by crops.

CROP HEALTH

Weed competition with crops for nutrients, moisture and sunlight significantly reduce final yield. PA requires a farmer to have information of the types of weeds dominant within his field, their sizes and the soil type (soil analysis result). The farmer can thus select the best approach to control the weeds, be it mechanical or chemical or even a combination of both. When using herbicides the application rate will depend on the weed spectrum, growth stages of the weed, as well as the soil type. Proper calibration of the spraying equipment used is an imperative to avoid under and over application of the herbicides. Delayed and inefficient weed control may result in 30% loss in the potential yield of the crop.

TECHNOLOGIES OF PRECISION AGRICULTURE

Various technologies are being discovered and introduced, which will help in enhancing the level of accuracy and control of the operations, thus increasing the level of precision. The use of technologies such as remote sensing, drip irrigation and field mapping serve as a tool to help the automation of a well-designed system and as a result increasing the number of correct decisions per unit area of land. The farmer should therefore work on improving the systems and cultures on the farm that are premised on precision farming as it is now the way to go.

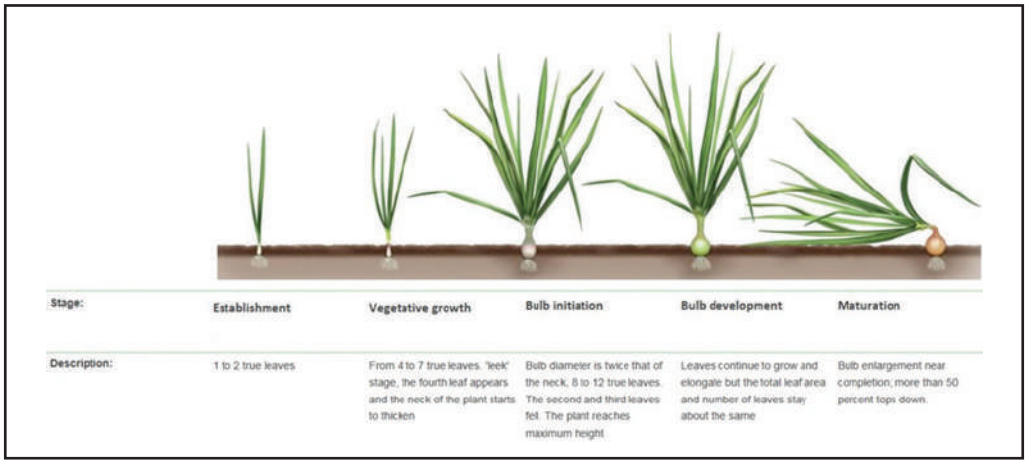
Conclusively, PA is generally the practice of doing the right things at the right place and at the right time, with accuracy and control, as informed by data collected from the different variables in the field.

Onion Self Sufficiency in Zimbabwe - An Achievable Feat in This Decade

By Francis B. Mapindani and Brian Nyandoro

Onions are an important crop consumed on a daily basis in each and every household worldwide. Of the two types of onions; yellow onions are the most favoured type by Zimbabweans while the red onions are viewed as more of a novelty type.

Onions, are therefore a mainstream crop which by nature is supposed to be grown so widely enough by local farmers to meet the demand requirements of Zimbabwean consumers but however, the market always falls short. Every single year, ***onion imports*** always trickle into the country from South Africa which according to the Trend Economy website, commands about 98% of all Zimbabwean onion imports.



Onions are relatively easy to produce under the Zimbabwean climate with most of the fresh and dry onion production happening during the winter period when we receive short day lengths. This is because most of the onion varieties grown locally start bulbing when they intercept light for 10-12 hours per day. The greater bulk of the onions produced are sold as fresh onions and the rest as dried. Selling these ***dried onions*** successfully is the achievement which proves to be a little harder for most producers. It can be about two to four months after harvesting before the prices start to rise and the best time to sale dried onions thus, the storage abilities of the onion variety propagated play an important role. Proper storage conditions coupled with good post-harvest handling can also help deal with this storage headache.

SEED CO ONION VARIETIES

Seed Co Vegetables offers onion varieties that can provide solutions relating to storability of the dried onion produce. The varieties available in stores are ***Dina F1, Ada F1*** (both yellow varieties) and ***Neptune F1*** (a red onion variety). These are Israeli bred varieties that can be stored for up to six months under good storage conditions. High yields that can eclipse 80t per hectare can be achieved with all the aforementioned cultivars. Plantings of these onions can start as early as Mid-January to end of June. Choosing these varieties, coupled with Good Agronomic Practices can be the first step to ensuring onion self-sufficiency in Zimbabwe with the goal of being a net exporter of onions regionally.

Seed Co Vegetables has Agronomists in all the provinces of Zimbabwe who are at your service for free once you purchase any of their vegetable seed varieties. Feel free to get in touch with them for any onion enquiries, agronomy tips and after sales support. For any quick Whatsapp enquiries, get in touch with our Digital Desk on +263 785 883 702.

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Making and Maintaining Silage

By Red Dane Farming

Now, more than ever because of high drought frequencies Zimbabwe, knowing how best to make and maintain your silage is vital to the success of your dairy herd.

The first step in silage making is to have an excellent maize crop. We recommend a maize variety that has a high grain yield to give you high starch levels, as well as good stay-green characteristics to give you a longer window for harvesting. The maize should be planted early in the season, from first October to early December to give it enough heat units to grow big enough.

CUTTING THE MAIZE

About the cutting equipment? – At Red Dane, a John Deere self-propelled silage cutter is used for the large-scale dairy, while JF silage cutters from Brazil are used on the smaller farms. The self-propelled machine has a very high output and ensures that the maize kernels are cracked, which leads to a much higher feed utilisation. The JF cutters are suitable for most Zimbabwean farms. Red Dane also uses Van Zyl tipper trailers to speed up the process and save labour; these are excellent trailers and have other uses in the off-season. The silage cutting blades should be sharpened at least twice a day during cutting to ensure a clean cut.

When to cut? - Test the dry matter content of the maize crop. It should be from 28% to 36%. Inspect the colour of the maize; most leaves should still be green with maybe the bottom two turning yellow and the pips should be in the hard, doughy stage.

How big to cut? - The drier the maize, the smaller the chop should be, although in general, it should be cutting it into 1 to 2cm size pieces. If the cutter is equipped with a nut cracker or a shredder, give the maize a longer chop, up to 3 cm. It is vital that there are no whole pips in the end product.

STORING THE SILAGE

In the last few years, we have introduced an inoculant to our silage to reduce dry matter loss when storing the silage by using Kemin inoculant, which is sprayed onto the silage as it exits the chute during cutting using an electric knap sack mounted on the tractor. The use of the inoculant has reduced dry matter losses from 20 to 5%. 1g of inoculant should be added per tonne of silage. There are two main silage storage methods;

A. Pit Storage

How to make a silage pit? – The pit must be 1.25 to 1.5 m^2/t of silage. The sides and bottom of the pit should be firmed and covered with plastic to avoid dirt getting into the silage. The ends of the pit should be sloped so that tractors with the tippers can drive into the pit and over the already dumped silage to help with compaction.

What is best practice for filling the pit? – One must ensure that every layer of silage emptied into the pit is well compacted to cut out any air and thus avoid aerobic digestion and the loss of dry matter: ***ensiling is an anaerobic process.*** At Red Dane, a Tractor-Loader-Backhoe (agricultural tractor fitted with a front loader and rear backhoe attachment) or front-end loader is driven over the top of the silage pit for maximum compaction. If compacting with

a tractor, use one with narrow wheels and add as much weight as possible on it.

As soon as the pit is filled or filling is done for the day, cover and seal the pit immediately by first covering it with high quality silage cover plastic to prevent any oxygen and unwanted moisture creeping in. Furthermore, protect the plastic with strong shade-cloth or a 30cm layer of soil. If possible, for extra protection pile something heavy for example old tires on top of the plastic.

How should to feed out of and maintain the silage pit? - When starting to use the silage, remove a section that is at least a metre wide each day and make sure to cut a straight edge into the silage to remove the portions.

It is important to only cut out enough silage to feed to the cows within a maximum of 6 hours. Silage stored in bags is exposed to oxygen and will start to ferment; meaning you will feed your cattle with fermenting or even rotting silage which will be poor nutritionally.

Always feel (touch) the silage for freshness before putting it into the feeding trough. If an inoculant was used before storing in the pit, the feed should be cold to touch.

It is important to avoid water getting into the silage. During the rainy season, water can rain down from above and come through the soil below, soaking your silage and leaching out its nutrients. If this happens, feed the soaked silage if not rotten, to the followers (young stock in a dairy herd intended as replacements in the production herd). Bag wet and dry silage separately. More wet silage needs to be fed than dry silage per cow because it has a lower dry matter content.

Ensure that the silage baggers are trained to pick up on and discard mouldy, rotten or dirty silage. Mouldy silage could make your cattle sick so it must be avoided at all costs.

B. Silage Sausages

What are they? - Silage sausages are defined as long, tube-shaped bags of thick plastic full of silage that, if maintained properly, keep your silage safe from oxygen and moisture, and thus any secondary fermentation and loss of dry matter. They can be any size needed, with a storage capacity of up to 80 tonnes each. Silage sausages are a way to store silage at almost any spot on the farm, without having to build a silage pit.

What is needed to make them? - In addition to the silage cutter, a silage sausage filling machine and the trailers used to funnel silage into the machine will be required. Red Dane buys the machines from RadZim who import them from Brazil.

The area should be protected from possible vandalism or anything else that might slit open the sausage's plastic - rat control is also vital. The sausages should be placed in a protected area of flat land with no sharp sticks or stones in the ground, and have at least 120 m^2 per 80 tonne sausage.

How to feed out of and maintain silage sausages? - When feeding out of the silage sausage, cut out the desired amount of silage along a straight edge. 1m of silage is equivalent to approximately 1300 kg of silage. Ensure that after each cut the plastic at the end of the sausage is tied up securely again. Weigh down the ends with something heavy.

Do not ever let anyone climb up or stand on the silage sausages, and avoid driving machinery close by as that can damage the plastic.

As with the silage pits, make sure that any mouldy or rotten silage is discarded, and that the silage is cold to touch when cut out and put into the feed troughs.

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Unlocking Next Generation Goat Production and Value Addition

By Chief K. Masimba Biriwasha, Founder & CEO Goat Orders Co.

Business opportunities, such as meat goat production, exist for Zimbabwean farmers to diversify farm operations, explore alternative enterprises and innovative marketing systems to increase farm income while boosting the national nutritional index.

Goats are versatile animals and can thrive in environments that are difficult for other livestock. They offer a wide array from products which include milk; meat; leather; wool (depending on goat breed); and value-added products from milk such as cheese, yogurt and body products such as soap and therapeutic skin creams. Despite the primary reason for goats rearing, the choice and management of the goat breed can make the difference between the goats making or costing you money. It is important to know the tricks of the trade as it will allow you to make the most out of the goats without losing your shirt in the process.

BARRIERS IN GOAT MEAT PRODUCTION AND CONSUMPTION

In Zimbabwe, goats have a long-standing negative reputation. They are regarded with disdain and on a social perspective they are viewed as highly troublesome, impatient and ill-disciplined domestic animals in comparison to cattle or sheep. To complicate matters, the goat value chain is highly distorted that consumers are deprived of high quality, safe and affordable goat meat. Another reason for low consumption of goat meat is that the in the culinary world the meat is mistakenly understood as no-no because of its strong scent. Fortunately, interest in goat farming is increasing in Zimbabwe, hence the need to reimagine the place of the goat in our national consciousness. According to projections, it is critical that we make a concerted effort to increase our national goat herd from the measly 4,3 million to 25 million by 2025 – firstly by addressing the issue of inbreeding which is perhaps the biggest bane to successful goat production and secondly improving on selective breeding and feeding regimes that othermeat animals have had to improve their confirmation and yield. This has rarely been applied to goat husbandry hence goat carcasses are seen as inferior to those of other meat animals.

CHALLENGES IN THE SUPPLY CHAIN

A highly disorganised supply chain can explain why goats have not been fully embraced as part of Zimbabwe's food culture. Due to middlemen who reap where they did not sow, goat meat is difficult to find or is too expensive compared to other meats.

THE NEW DAWN

The understanding of the determinants of demand is crucial for goat meat production; there is a gap opening in the supply chain as more people start consuming goat meat- we have to dismiss the connotation that goat market has no demand as this analysis is now simply pedestrian.

Production - While the organised and streamlined marketing structures are needed for the supply chain, re-evaluating the goat's place in Zimbabwes economy is the first place to help unlock the hidden opportunity which could help in building a collective and shared economy in the next decade. There is need to maximise production capacity at the farm level through fencing, paddocking, penning, feed, veterinary care and access to water -making goat farms more efficient, and the goats healthier thereby increasing potential yield.

Polices - Agricultural policies to reposition goats are needed - a national code on how to keep and sell our goats. National campaigns on goat meat can also help spike interest in consumers as chevon is a delicious change from beef, fish, chicken and pork.

Technology - Genetics and feed technology can help to dynamically transform the goat industry.

Goats can indeed change farmers lives if we can sustain the growing interest and adopt new perspectives to goat production and value addition.

Goat Orders is a fast becoming a leader in the goat meat segment in the country. We focus goat production training, on delivering the best quality meat and ready-to-eat products. www.goatorders.co.zw

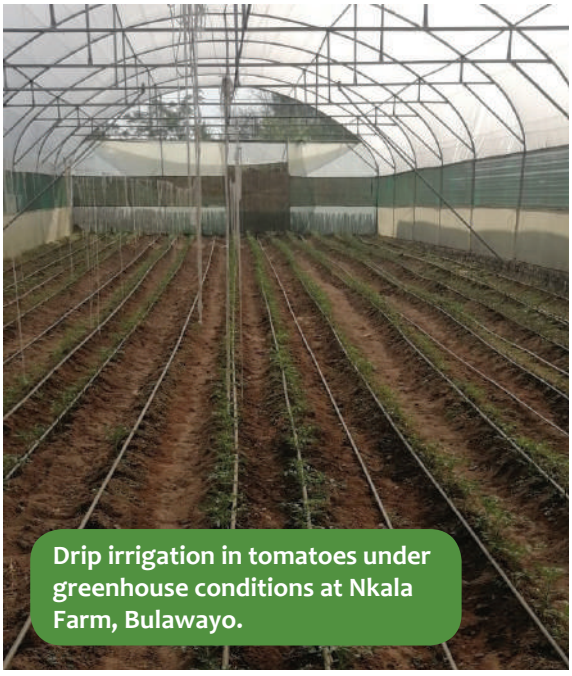
Sprinkler and Drip Irrigation

Sprinkler irrigation ready to water tobacco seedbeds in Rusape.

Sprinkler irrigation on a garlic field at Purple Horizon Farm, Kwekwe

Reel and Trolley irrigation Unit

Drip Irrigation and Weed Mat in blueberry farming at Maricou Farm, Enterprise.



Drip irrigation in tomatoes under greenhouse conditions at Nkala Farm, Bulawayo.

Drip lines demostration plot by Driptech

For more information on drip irrigation refer to ZiMunda Farming Issue 2; Making Every Drop Count by Driptech.

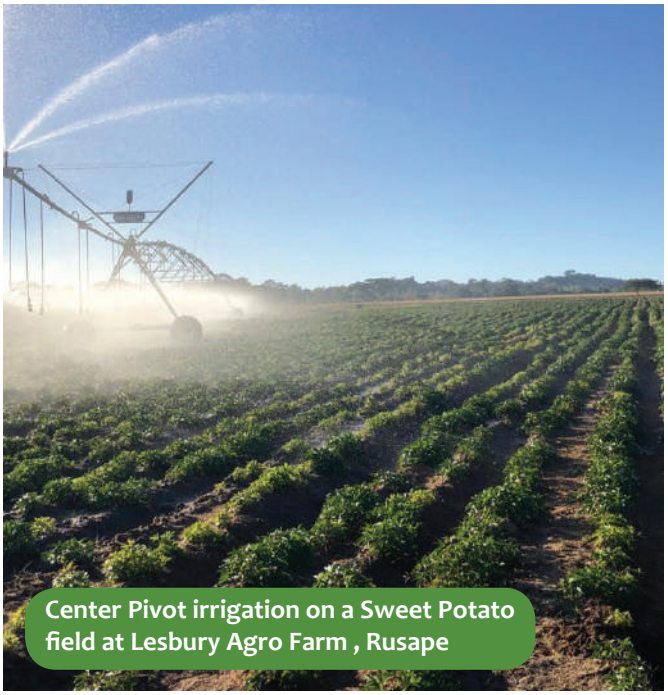
Pivot Irrigation

Displaceable pivot on wheels

Linear pivot irrigation

Center Pivot tube and sprinler at Ansellia Farm, Mazowe

Center Pivot rotation wheels in action on a tobacco field in Rusape.



Center Pivot irrigation on a Sweet Potato field at Lesbury Agro Farm , Rusape

Center Pivot irrigation on a tobacco field in Hwedza.

For more information on center pivot irrigation refer to ZiMunda Farming Issue 4; Water Management by Otech.