ZiMUNDA FARMING

NEWSLETTER

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AGRONOMY

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AGRI-TECHNOLOGY

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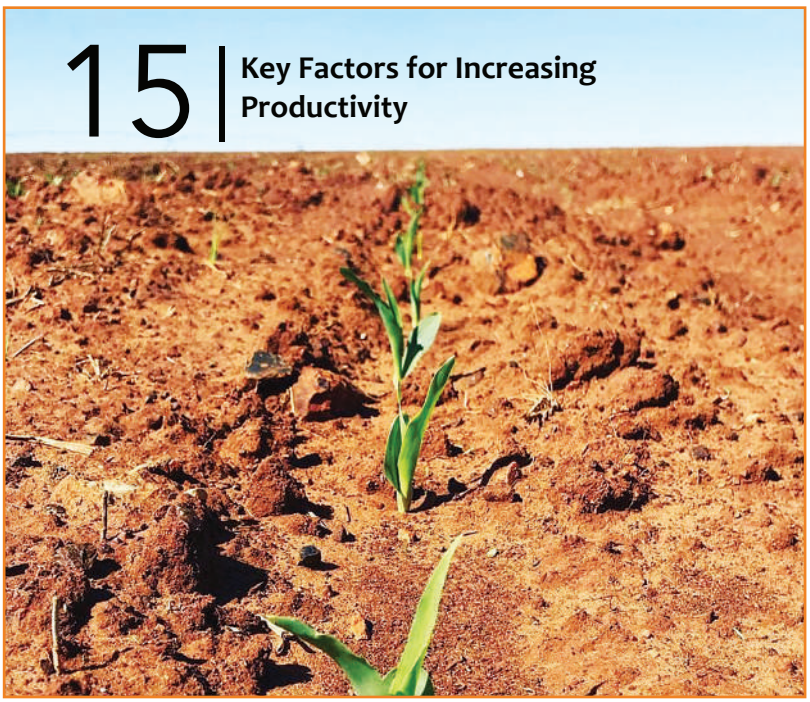

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COVER

Land preparation using a field king implement on a New Holland tractor. Image provided by Croco Commercial

Premium Off-grid Solar Solutions

Solar ENERGY PROJECTS

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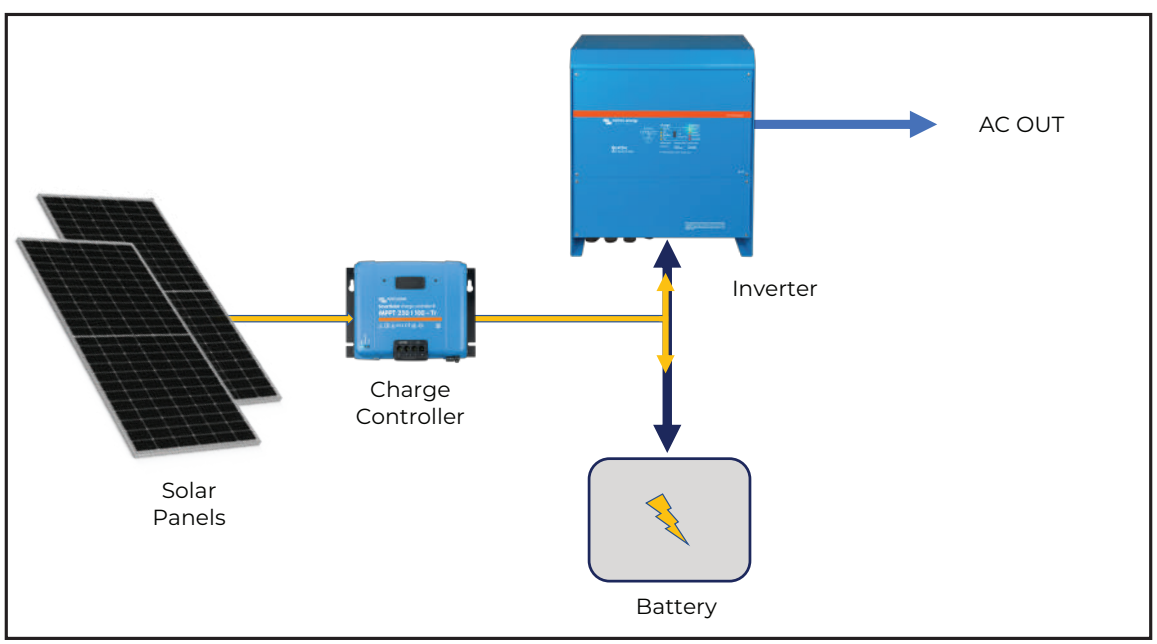
Solar Solutions for Off-grid Power Supply

Photovoltaic off-grid systems provide the perfect solution for a flexible, decentralised and affordable energy supply in remote areas. Solar Project Energy (SEP) correctly designs off-grid solar systems in order to generate enough power throughout the year, equipped with battery capacities which meet the installed locations electrical energy requirements or demand.

Generally, off-grid solar system sizing or specifications are based on your peak wattage and daily Watt-hour (Wh) requirement. Daily Wh usage is calculated from your utility bill over a time-period but may require more accurate usage pattern monitoring with our energy metering data loggers.

'SEP offers complete solar solutions which help you become completely independent from external energy supplies, move away from the spiralling diesel generation costs and for remote homes, save yourself from high grid connection charges.

COMPONENTS OF AN OFF-GRID SOLAR POWER SYSTEM



Most DC-coupled off-grid systems are made of four main components – solar panels, charge controllers, an inverter and the battery bank.

Solar Panels - The most cost-effective monocrystalline solar panels are those made up of 156 cells. A typical 156 cell monocrystalline solar panel will be around 2182×1029×35mm in size with an output in the range of 465-540 watts, whereas as older models have 144 cell panel will measure 2000 X992 X35 mm usually with an output around 360 watts or above. At SEP the product range of solar panels available are currently 390W to 535W Jinko Monocrystalline Panels. We are a proud official distributor of Jinko Solar panels, the largest distributor of solar panels in the world with award winning performance and reliability. SEP continues to surpass its volume targets, securing the best available panel pricing.

Once the daily power requirement is established, the number of panels is calculated while considering all losses and any shading. The panels are wired together into a solar array whose output is fed to the next major component, solar charge controller. There are a variety of ways to mount solar panels to make sure they do not get damaged, stolen or blown away. SEP uses two main ways;

- Roof Mount (Mounting the solar array on a home, shed, chicken coup or other shelter structure).
- Ground Mount (Mounting the solar array on steel structures manufactured by SEP).

Charge Controller - The device manages the flow of energy from the solar panels to the battery. Charge controllers make sure batteries are charged properly and are not overcharged which is important for the longevity of the battery bank. There are two main types of charge controllers, MPPT (Maximum Power Point Tracking) and PWM (Pulse Width Modulation). At SEP, we offer MPPT Charge controllers for maximum power harvesting.

Inverter - In nearly all off-grid solar systems, the inverter is a battery-based inverter. The inverter's purpose is to take DC power that is stored in the battery bank, convert it to usable AC power and send it to your loads so it can be used in the same manner as plugging into an AC outlet in a home

or workshop. Inverters come in different sizes which can accommodate smaller loads or larger loads depending on the off-grid loads required. SEP offers a wide range of inverters from 3kVA to 690kVA (which can be connected in parallel up to 5MVA. For installations up to 90kVA, we primarily use Victron Energy, a premium Dutch brand which engineers' robust equipment, perfect for Africa.

Solar Energy Projects specialises in Victron kit, offering industry leading support, remote online monitoring, and dynamic applications.

Batteries - The last main component in the solar system is the battery bank, which is one of the most important considerations (refer to ZiMunda Farming Issue 22). Lithium batteries are significantly more superior to lead acid batteries; depth of discharge, number of charge cycles, safe chemistry and a built-in BMS deal a knockout blow to lead acid batteries in the long run. They also charge faster and deliver a substantial amount of power continuously without damaging the battery. Round trip efficiency of 97% Vs Lead Acid/Gel of 65%.

FEATURES OF SEP'S OFF-GRID SOLUTIONS

- Uninterrupted power.
- Generator auto-start.
- Highly customisable.
- Scalable.
- Adaptive charging.
- Hybrid Power Assist technology.

AN IDEAL SOLAR SOLUTION FOR EVERY SITUATION AT SEP

SEP offers a complete range of services and flexibility to meet your needs. Ranging from distributing numerous, complete off-grid kits to designing and installing off-grid systems. With SEP you benefit from The Power of Experience. Since 2009, we have installed over 3000 top-end systems throughout the country covering home, farm and office installations.

PROJECT IMPLEMENTATION BY SEP

- Customisation design and supply of all systems.
- All equipment is pre-assembled and tested
- Solar Energy Projects installs the equipment.
- Systems installed to specification design requirements reducing time on-site and overheads.
- Simple and reliable support through Solar Energy Projects.

We offer complete, pre-assembled off-grid solar solutions with the below example of one of our most popular and proven home systems with sizing options designed by SEP. These pre-assembled kits give our customers an overview of all the premium components used with explanations to assist them with their off-grid solar system planning. The brochure is available electronically via email and WhatsApp.

Gain energy independence, access to electricity or reduce diesel generator costs for your home by leveraging our complete off-grid solutions for homes, farm space and operations.

SEP not only provides you with all the necessary PV components, but also assists you with reliable backup and support. For support and inquiries on Residential, Commercial, and Industrial off-grid solar offers, contact 0719 228 047.

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Croco Commercial - Providing Relevant Solutions to Zimbabwe's Agricultural Sector

Africa is richly endowed with natural resources and minerals; from fertile soils, conducive climates, countless plains to coal, iron, gold, and all other precious minerals one can imagine. The exploitation of these natural resources presents immense opportunities to sustain agricultural economies in Southern Africa. In Zimbabwe, the agricultural sector largely contributes to the overall economic development of the country.

Croco Commercial is a proudly Zimbabwean company and a subsidiary of Croco Motors which specialises in sales and servicing of agricultural tractors and their complimentary implements. On offer is a range of products from reputable brands such as New Holland, Fieldking, and Sfoggia planters. Heavy-duty vehicles such as buses, trucks and tippers from the UD, Volvo, and Eicher stables are also available, ranging from 3 to 30 tonnes.

NEW HOLLAND TRACTORS

The New Holland tractors are popular amongst the Zimbabwean farmers, as the tractors deliver value for money, in particular the new TT4 series. It is characterised by excellent design and manoeuvrability, ergonomic comfort and fuel efficiency. The tractors are engineered to offer farmers ultimate versatility, they feature 2.5 tons maximum lift capacity, have hydraulic flow up to 54LPM and are equipped

with 10 new transmission options tailored for every farming operation.
Croco Commercial prices for the New Holland TT4 series are affordable and highly competitive, intending to empower all farmers in the country from small-scale to commercial farmers. Although the TT4 range is simple to operate, easy to maintain, and built to go the distance, Croco Commercial offers nationwide after-sales services to ensure that regardless of the location the units are kept running at their best.

COMPLIMENTARY IMPLEMENTS

Croco Commercial has a wide range of implements such as reversible and fixed disc harrow ploughs, cultivators, planters, and backhoe loaders, including the popular four and six-row versions of Sfoggia planters that are well suited to this environment and local farming needs.

There is always a Croco Commercial branch near you.
Accessible nationwide with representatives in Harare, Bulawayo, Masvingo, Selous, Chiredzi, Kadoma, and Mutare, Croco Commercial's after-sales support includes the provision of world-class service, field support, and affordable supplies of spare parts to ensure the best possible experience.

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Driptech - Blueberry Field Day

By Sarah Langerman

With an objective of promoting blueberry production in Zimbabwe, Driptech held a blueberry field day in the Enterprise area on the 3rd of September 2021. Since blueberries were first trialled in Zimbabwe using greenhouse systems, the cost of production for instance irrigation costs has since significantly reduced.

During the field day, a group of farmers and interested parties had a chance to look at the various factors of blueberry farming. The companies that were directly involved in the project were invited to speak on their sections;

Driptech gave insights on irrigation; how they the planned and installed the project's irrigation system with its expansion in mind. When the project expanded, it was then easy to add sections and modules to the existing systems.

Agristructures took us through the steel structures they installed from the impressive pump house, packhouse to the offices and the in-field reaping stations.

Dudutech presented on the Integrated Pest Management (IPM). They expanded on a few IPM methods such as using natural predators, pheromones, and traps. Using IPM systems means that pests and diseases are naturally controlled and the use of harmful chemicals is reduced, keeping natural balances of insects in check.

Netafim-South Africa, made the trip up to talk about their state-of-the-

art irrigation products used in the project.

Natural Air installed the cooling systems the projects' rapid coolers and cold room facilities. The company designs very well thought out systems to tailor-make cooling systems.

THE BLUEBERRY PROJECT

The blueberry project was established in early 2019 as a greenfield project and has flourished very quickly. An initial 10 hectares was planted and expansions were made until 42 hectares were in the ground. The smooth operation is run by Craig Torr and Stu Torr, the Vice President of the Berry Growers Association, which falls under the Horticultural Development Council.

Blueberries can be planted straight into the ground or into pots containing substrate. Pots are usually used if the soil is not ideal for production. Pot planting has higher costs as compared to ground planting.

In the fields, the blueberries have a population of 4,000 plants per hectare and are pollinated by bees kept in hives within the fields, as well as wild bees in the area. Weed matting is used along the rows of plants to reduce any weeds that might benefit from the system.

The plants are irrigated using drip irrigation and computerised, automated fertigation systems called Netajets. This means the plants receive the absolute optimum nutrition and irrigation they need to flourish. The computers and pumps are connected to a solar system to prevent power fluctuations burning out any equipment.

A few blueberry varieties are used to take advantage of the different characteristics of each variety. The berries are picked by hand and transported to the packhouse in a refrigerated truck. The harvest is then placed in rapid cooling rooms for it to reach the optimum temperature. Rapid cooling significantly increases the shelf life of the berries. After rapid cooling, the berries are graded, weighed and, packed in a temperature-controlled room and then moved across to cold rooms to await transport. The berries are transported to various destinations around the world, via Cape Town.

At their peak, the plants produce 3.5 kgs of berries per season, rewarding the hard work and meticulous planning that went into the impressive blueberry project.

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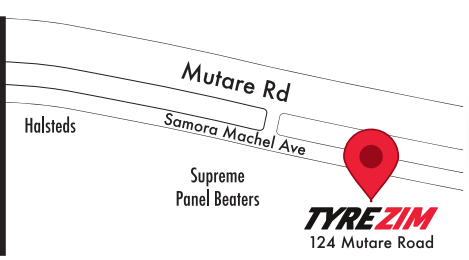

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The ART of Farming - Summer of 21

By Rob Jarvis

Cabbages and straw bales - part of the farming system at Art Farm.

It appears that the face of commercial agriculture is rapidly changing and we here at the Agriculture Research Trust are no different from other farms in the country. Input costs are escalating, sometimes for no explicable reason. Costs going up in real United States dollar terms are very difficult to mitigate against. Especially when the ultimate value of broad-acre summer crops, in particular, are largely a function of the amount of rainfall we receive countrywide. A good well-distributed rainfall pattern and production nationwide goes up dramatically. Controlled deliveries result in the marketing boards trying to hold prices down to manageable levels because the overall amount required to buy a bumper crop is astronomical.

> We all look at ways we can simplify the farming system, use less inputs, perhaps grow higher-value crops and do everything that we can to maximise yield and reduce risk and losses.

It is not easy! If your new ventures hit the market at exactly the right time, then gross income and profits can be very attractive. At the wrong time, you will quickly realise that there may be better ways to earn a daily living. Increasingly we are all being tied to financiers in one form or another. Tobacco companies, commodity traders, brewers, bakers and of course the Government itself, are all eager to plug the gap between individual, company and ultimately national demand and production. Fortunately, some of these financiers supply a full package to help ensure the success of their schemes and to attract the very best growers. This can include equipment hire, fuel, fertilisers, a basket of chemicals and then access to mechanical harvesting equipment to ease and speed up the

Winter wheat needs protection from red-billed quelea for economic gain.

delivery of the commodity grown. Even cash can be supplied to pay wages and meet living costs.

However, whatever you do, it is important to have a handle on costs, operate to a budget and to grow, harvest and deliver the crop as quickly as possible to the ultimate buyer so you can quickly convert revenue into either tangible inputs for the next season's cropping programme or to invest in a longer-term holder of value, like cattle or a suitable plantation crop. It is a tightrope and a big mistake that could see an enterprise fail financially with no way out because the traditional sources of financing, the banks, are not playing that role in our economy. Years ago, if the financing came a cropper with one bank you would prepare a new cash flow and a wonderful story to take to the next bank and they would finance your operation afresh. A good season and a favourable market could totally reverse a poor financial performance and have all loans repaid. Today it is a different story and you really need to be sure that everything you do, contributes to the bottom line.

So, the prelude to the new summer season are tense times, have we made the right decisions, have we secured sufficient inputs, will the weather be kind and have we invested enough in mitigating infrastructure like irrigation to smooth out the highs and the lows? Hard questions that will test us. Will the cropping programme meet the highs of the market and will we choose better options for the known flat periods that inevitably occur in seasonal cropping cycles?

Time will tell and here at ART we are investing more in shorter duration crops like potatoes and vegetables to get the cash cycle turning quickly and reducing our risk with maize, prone to poor performance with the dreaded mid-season drought and of course to light-fingered theft. Soyas too are attractive because of ease of production but they are very prone to poor weather conditions and yields can be well below normal if the rains start late cut-off early or even worse, if they extend into the traditional harvest period of April/May. Violent storms in April have shattered many farmers' hopes of a bumper soya bean harvest.

And so, at ART we are looking at all the options going forward, regenerative agriculture, bringing in cattle more aggressively into the farming system, composting, fodder crops, minimising tillage, reducing dependence on inorganic fertilisers and crop protection chemicals and all along the way hopefully increasing soil health, boosting crop output and quality and speed to market.

Cattle on fodder crops – the system paid for the seed value with 2 days weight gain.

Inexpensive herd control - training and barrier tape is all that is required.

Bonanza! Borehole drilling (this one worked very well).

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Key Factors for Increasing Productivity

By Wendy Madzura, Head of Agronomy Seed Co Zimbabwe Ltd

There are a number of reasons for low yields in a crop production system, but only two are noteworthy for high yields. These are;

- Selecting the best germplasm or seed for a given crop, and
- Employing Good Agronomic Practices (GAP's).

The selection of the best germplasm is guided by the desired crop; its variety traits and crop management (GAPs). The GAPs will unlock the genetic potential of the established crop for maximum attainable yield.

Increasing crop productivity is achieved by understanding the following five factors:

1.SEED FACTOR (THE RIGHT SEED)

Selecting the right seed is guided by the farmer's desired outcome and knowledge of the end use of the produce. For example, the maize crop can either be for silage, green mealies or grain.

Farmers are implored to embrace the "climate-smart", modern innovative seed technologies which are aimed at mitigating against the effects of climate change. For example in maize production, these include ultra-early maturing maize varieties like SC 301 (90-120 days to reach physiological maturity), drought-tolerant maize varieties (the very early maturing SC 419 and early maturing SC 529 and SC 555, medium maturing SC 649, 657, SC 659 and the late-maturing SC 719 and SC 727).Climate-smart varieties have drought escape and drought tolerance mechanisms coupled with defensive agronomic traits such as tolerance to lodging, a vigorous root system and good tip at maturity.

Farmers should be conscious of the fact that disease and insect pressure tend to be high during the rainy season therefore, one should select seed varieties with a degree of resistance to avoid incurring economic yield losses.

In addition, it is encouraged to be health-conscious and adopt bio-fortified crops such as orange maize, ZS 242 with vitamin A.

A wide range of field and horticulture crops that can be grown during the rainy season.

2. CLIMATIC FACTORS

Climatic factors such as humidity, cloud cover, wind, altitude, air temperature and the rainfall pattern are important elements in farming because they act as the enablers for the crop to grow.

The altitude (height above sea level) is a measure used to describe the angle of inclination of an area and this has a bearing on the rate of growth of crops. Crops established in areas of high altitude tend to take a longer time to reach physiological maturity due to the cool weather conditions associated with the low heat units (Growing Degree Days) while crops established in areas of low altitude tend to grow much faster because of the higher heat units experienced. The duration of growth, therefore, affects a farmer's cropping plans and level of productivity as it affects the days to maturity.

The rainfall (amount and distribution) is an important yield determinant, especially under rain-fed agriculture. Farmers should always align their cropping plans with the nature of the season to enable informed crop and variety choices to be made. The rainfall distribution is also understood based

5 KEY FACTORS FOR INCREASING PRODUCTIVITY

1. Seed factor (The Right Seed)
- Yield potential
- Drought escape/ tolerance
- Disease tolerance
- Crop Standability

2. Climatic factors (Abiotic/ non-living factors)
- Altitude and air temperature
- Rainfall amount and distribution (seasonal forecast)

3. Crop management
- Planting dates and spacing
- Irrigation scheduling
- Scouting and effective pest management
- Rotation plan

4. Soil factors
- Soil fertility
- Soil pH
- Soil structure

5. Biotic factors (living)
- Diseases
- Insects
- Weeds

on the Agro-Ecological Zones (AEZ). Knowledge of the AEZ from region 1 which is characterised by high rainfall (>1000mm) to region 5 which receives low rainfall (<650mm) enables farmers to understand the average rainfall received in a given season and relate it to the seasonal forecast that is issued by the Metrological services department.

3. CROP MANAGEMENT

During planting, farmers are encouraged to use the recommended ***seed rates and spacing*** to achieve the optimum plant population for a given crop and variety. This is because yield is a function of two things, yield per plant and yield per unit area. For maize farmers can use 25kg's of seed to plant 1hectare (2.5acres) or seed packs that come with a specified number of kernels (20 000 kernels or 50 000 kernels). The recommended inter-row spacing for maize is 75cm to 90cm while the in-

row spacing is 18 to 25cm. Farmers should aim to achieve a plant population of 50 000 to 60 000 plants per hectare in high potential areas or under irrigation while low rainfall potential areas are recommended to achieve a plant population of 36000 to 44000 plants per hectare. If germination is poor gap filling or replanting should be done in the 1st two weeks after crop emergence.

4. SOIL FACTORS

The soil is the main growing media in which crops grow and as such, is a key ingredient in increasing crop productivity. ***Soil pH, fertility status and structure*** determine the crop's ability to utilise available nutrients to achieve an intended yield level. The pH level describes the soil's acidity or alkalinity on a calcium chloride scale or potassium chloride scale. This unit of measure has a bearing on the availability of crop nutrients to the crop and therefore affects fertilizer use efficiency. In Zimbabwe 70% of the soils are acidic and as a result, farmers are not reaping the full benefits of organic or inorganic fertiliser applications because acidic soils reduce the availability of macro and micro-nutrients for crop growth thereby reducing the fertiliser use efficiency. In some cases, only 20 to 30 % of the total fertiliser applied is utilised by the crop resulting in low yields and reduced crop productivity. The best way to address soil pH and understand the nutrient requirements of crops if through Soil Analysis. Basal fertiliser should be applied before or at planting in the form of compounds or specialised blends depending on the crop.

Compound D with a Nitrogen: Phosphorous: Potassium (N:P: K) ratio of 7:14:7 or blends (6:23;23 or 14:28:14) is used in maize as a basal fertiliser and upon top dressing AN or Urea fertilisers are applied at the vegetative stage of a crop to promote vigorous growth which ultimately gives high yields. Split application is encouraged for top dressing fertilisers to reduce leaching and volatilisation of AN and Urea, respectively.

The soil structure affects root growth, water infiltration and beneficial microbial activity thereby impacting crop production. Soils with poor drainage (plough pan or heavy clays) tend to reduce water infiltration and promote runoff. Improving the soil structure is one way of ensuring that we preserve the abundant growing media in a way that allows for effective crop growth without compromising the environment for future generations (sustainable agriculture). The adoption of conservation agriculture which is hinged upon minimum soil disturbance, permanent ground cover and rotations is one way in which the soil structure and water can be conserved. Manure (organic matter) should be fully decomposed to avoid the introduction of insect pests and diseases into the field.

The ***choice of land preparation*** should aim to achieve a fine tilth which will ensure good seed to soil contact and effective germination resulting in a healthy crop stand resulting in increased productivity. In addition to this water harvesting techniques such as potholing, tied ridges and mulching are greatly encouraged to mitigate against the unforeseen weather vagaries of climate change which include prolonged dry spells and droughts.

5. BIOTIC FACTORS

Prior to establishing any crop, farmers should understand the problematic insect pests and diseases that might affect the crop and prepare for them. Some varieties may be tolerant or resistant to ***problematic diseases*** like Grey Leaf Spot (GLS) and Maize Streak Virus (MSV) in maize; and leaf rust in soya bean. The selection of such varieties may have a cost-saving effect thereby increasing profitability in farming. In addition to these varieties, regular scouting will enable one to apply preventative or curative/systemic fungicides to manage diseases when an infestation occurs.

Effective ***insect pest*** control depends on the effective identification and timeous control of the insect pest. In maize production problematic insect pests include Fall armyworm, African armyworm and the stalk borer Chillo worm. Regular scouting is encouraged to determine insect pest pressure before economic threshold levels are reached for effective control. Effective control is achieved through the rotation of insecticides with different active ingredients and modes of action. It also reduces over-application of agrochemicals which can promote the development of insect resistance.

It is also pivotal for farmers to effectively ***manage weeds*** using an integrated approach of cultural/ mechanical and chemical methods of weed control. Effective chemical/ herbicide use is hinged on the correct knowledge of the weed spectrum, time of application (pre-emergence versus post-emergence), correct application rates and the rotation plan. Weeds compete with crops for nutrients, water and growing space resulting in low yields. Effective weed control for the 1st 10 to 12 weeks after crop emergence is encouraged however it is best to maintain a weed-free field until harvesting to reduce admixtures that may affect the quality of the crop at harvesting.

Farmers should integrate the above factors to obtain optimum yield levels for increased PRODUCTIVITY and PROFITABILITY. Timeliness of farm operations such as planting dates (irrigated or dryland crops, fertiliser application type, time and rates (basal versus top dressing), weed and insect pest management are all pivoted on the farmer's involvement and commitment to the farming enterprise.

Farming is a business; it starts with the right seed coupled with Good Agronomic Practices (GAP's).

Images provided by ZiMunda Farming and Wendy Madzura.

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The Tuli Breed – Born and Bred in Zimbabwe

By Vimbai Ruvengo

The Tuli is a medium-sized animal which in its neat compact frame, incorporates high fertility, hardiness, adaptability and excellent beef qualities.

The Tuli breed is an African Sanga pure breed. Sanga is the collective name for the current indigenous cattle of sub-Saharan Africa. These breeds were taken by the Bantu tribesmen on their southern migration, and eventually occupied most of Eastern and Southern Africa. It is believed that the Sanga breeds have resulted from naturally occurring cross-breeding between indigenous African cattle with Zebu cattle. A zebu sometimes known as indicine cattle or humped cattle is a species or subspecies of domestic cattle originating in the Indian sub-continent.

THE HISTORY OF THE TULI IN ZIMBABWE

In Zimbabwe, the Tuli breeding station was established in 1945 to enhance the productivity of local herds being recognised for their increased beef production. The operation was spearheaded by Len Harvey an agricultural advisor and in 1955, the Tuli was registered in this country as an indigenous breed. With the official registration of a Zimbabwean breed, a number of farmers have since started rearing Tuli cattle for their distinctiveness.

THE PECULIARITY OF THE TULI

The breed originated in Tuli, Matabeleland, and as a result, many of the animals were yellow/gold, the colour of the silt/sand of the Tuli River, Harvey thought that Tuli was the most fitting name for the breed. The name Tuli stems from the Ndebele word 'utuli' which means 'dust', and vividly conjures up pictures of the arid environment the Tuli stems from. The breed's sleek and glossy short-haired coat varies in colour from mostly red, gold, ivory and dun.

The subject of coat colour in cattle is important from both an adaptation and economic standpoint. An animal with a dark-coloured hair coat can be at a disadvantage because it is more vulnerable to the intense radiation of short-wave and heat rays that elevate body temperature, thus impairing the animal's physiological well-being and performance. The colours of the Tuli cattle and their sleek shiny coats have enabled them to adapt well to the intense sunlight typical of the region.

BREED CHARACTERISTICS

In female Tulis, the accent has been on fertility, milk production and low calf mortality while in bulls it has been growth, feed conversion and carcass quality.

Tulis are known for their early maturity, good mothering ability, high fertility, docile nature and polled-ness (a genetic mutation that

causes animals within a horned cattle breed to not develop horns). Tulis are primarily naturally polled at a rate of 70 to 80% of calves. Since the breed has been selected in favour of their coat colour and they can withstand intense heat without showing signs of stress.

Due to their unique genotype, Tulis offer the maximum hybrid vigour in a crossbreeding program (refer to ZiMunda Issue 3). Their meat has relatively low levels of fat (just sufficient to give a good marbling), is tender and juicy.

BUILT FOR EXTREMES

Tulis are able to tolerate drought and heat extremely well due to the hardships of the early African cattle breeds to which the Tuli owe their genetics and adaptability to harsh conditions. They have strong legs and hard hooves and can walk long distances in the blazing heat, without stress. Tulis are robust, rugged and tough, they are highly disease and parasite resistant, especially the tick-borne diseases. They can cope with nutritional stress, just as well as with drought and water scarcity, and even when grazing quality is really poor, will still produce top-quality beef.

BREED UTILITY

The Tuli cattle are good for beef. The study of the Tuli breed by Ward and Tawonezvi (1983) indicated that the bodyweight of the Tuli at 5½ years of age was greater than that of Mashona, Nkone and Afrikaner. Similarly, calves sired by Tuli cattle were reported to have greater birth and weaning weights as compared to those sired by the Afrikaner and Aberdeen Angus.

BREED STATUS

Zimbabwe has an estimated total of 2500 registered pedigree animals,with about 10 active breeders spread around the country. The Tuli Breed Society of Zimbabwe was formed in 1961 to represent the interests of Tuli Breeders, promote the breed and its many advantages for the Southern African environment. The society is closely linked to the South African, Zambia and Namibian Tuli Breed Societies, which work together on the genetic evaluation of the Tuli breed. Breed societies for the Tuli were also established in Australia and the United States of America.

National Tuli Production Sale 2021

On the 15th of September 2021, the Tuli Breed Society of Zimbabwe held its annual production sale at CC Sales, Mt Hampden. Compared to the Tuli online auction held on the 22nd of September 2020 the experience was refreshing as this was the usual way to which all of us are accustomed, making this a very exciting experience for all involved.

During the auction, on offer were 56 pedigree and commercial Tuli bulls, cows, cows in calf and heifers. Local farmers came in their numbers and five Tuli stud sellers participated in the auction. Some were worried about the anticipated sales figures due to the change of the market as a result of the pandemic. In this regard, some sellers decided to reduce cattle on offer to a manageable number. The sellers included,

- Jambo Tuli, established in 1968 by Chris Johnson on Jambo Farm, Tengwe.
- L.Z. Tulis, established in 1978 in Gwanda.
- Oldonyo Tuli, established in 1995 Oldonyo Farm, Tengwe.
- Zviko Tuli, established in 1992 in Featherstone, Hampshire Area. Starting out with just beef and grain production, later diversifying its offerings to include stud and commercial breeding of Tuli and Mashona cattle.
- A fairly new establishment, Liva Tuli, Mazowe.

The organisers of the auction were content by the substantial prices achieved – with some recognisable sales as follows.
Bulls -Top price ZWL 340,000. Average price ZWL 277,000.00.
Cows - Top price ZWL 175,000. Average price ZWL 165,000.00.
Heifers - Top price ZWL 200,000. Average price ZWL 157,000.00.

Reference: Ward H.K. and Tawonezvi H.P.R. 1983. Production Traits of Mashona, Nkone and Tuli Cattle and of Some Beef Breeds Exotic to Zimbabwe. Animal Genetic Resources in Africa. OAU/STRC/IBAR publication. Nairobi, Kenya. Second OAU Expert Committee Meeting on Animal Genetic Resources in Africa. 24-28 November 1983: Bulawayo, Zimbabwe. pp. 86-95.

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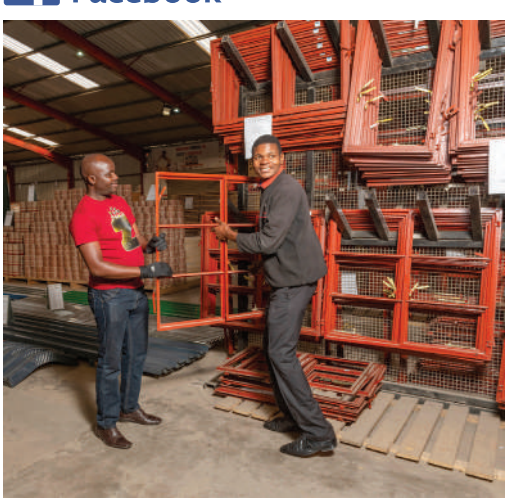

Neonatal Care for Piglets

By James Kabinda, Animal Production Specialist

Piglet survivability is one of the most important factors that determines productivity in a piggery as high survival rates of piglets translate to better profit. To ensure or to increase chances of survival of a newly born litter, general practices from birth such as; naval dipping, colostrum feeding and iron supplementation are pivotal. This article discusses these management practices of piglets and their importance to the pig enterprise.

NAVAL DIPPING

The umbilical cord should be gently pulled away or cut if necessary (to about 5 cm length) a few minutes after birth. The navel of each piglet should then be soaked in a cup of 3% iodine solution to prevent inflammation and tetanus. Each piglet should then be rubbed and carefully dried with a cloth.

COLOSTRUM FEEDING

It is important to check if the piglets are able to suckle from the udder as soon as possible after birth. Their suckling will encourage the sow to let down her milk. Weak piglets must be assisted to suckle.
Ensure that it is important that the piglets immediately take advantage of the first milk called colostrum. Colostrum should be taken by all the piglets on the same day they are born. If taken at this time the colostrum is able to protect the piglets against diseases. After the first one or two days, the digestive system of the piglets breaks down the colostrum and its ability to protect from diseases is lost. The piglets can be given supplemental feed of goat or cow's milk. If the milk produced by the sow is too little to meet the needs of the piglets or the sow completely neglects the piglets, they should be put on another sow (fostering) or reared on cow or goat's milk.

FEEDING PIGLETS IF SOW DOES NOT PRODUCE ENOUGH MILK

If the sow does not produce enough milk the piglets should be given to another sow which farrowed or gave birth up to three days before. This sow should have fewer piglets than the number of teats on her udder. This is because the teats which are not being used by piglets dry off after three days. Piglets normally take control of one teat at birth and continue to feed from it until they are weaned. Transfer extra piglets to the sow with fewer piglets after disguising them with Vicks on the sow's nostrils. This is done so that the foster mother does not differentiate its own piglets and the foster piglets. If there is no sow to take over feeding the piglets, they will have to be given extra food by hand. Goat or cow's milk can be given to the piglets in the same way as for motherless or orphaned piglets.

TEETH TRIMMING

It is usually necessary to trim the piglets' teeth using a tooth trimmer to prevent them from biting the udder. The piglets are born with needle sharp teeth which may injure the sow's udder and prevent the sow from letting the piglets suckle. The piglets would then be left to starve. Only the points of the teeth should be removed. If any more is removed there is a risk of damaging the mouth. When trimming the teeth, the tongue of the piglets should be rolled back to avoid injuring it.

IRON INJECTION

Iron is needed for the formation of haemoglobin and its deficiency causes a disease called Anaemia; an important disease to control, especially for young piglets kept indoors. At birth the piglets have about 50mg of iron in their body. They receive additional 1-2 mg/day from milk while they need 7mg during the first week. The quantity of iron decreases

rapidly if not supplemented. The piglets become very pale a few weeks after birth and their growth slows down. This can be prevented by:

- Giving the piglet (3 and 10 days after birth) iron injection (1 and 2 ml respectively) 1ml preferably on neck muscles.
- Oral iron- paste containing iron is put in the mouth within 24 hours of birth

TAIL CUTTING

The tip of the tail is cut within 4-7 days of life. This prevents tail biting, which can lead to infections. A piece of chain can be hung down from the ceiling for the piglets to chew.

HEATING FOR PIGLETS

In cold weather, a small area can be heated with an infrared lamp. This keeps the young pigs warm. It helps prevent pneumonia and crushing as the piglets tend to stay under the lamp when not feeding. Piglets should be vaccinated at day 7 using a 2ml intramuscular injection of Respisure vaccine-a preventative measure against pneumonia.

CREEP FEEDING

Young piglets from the age of 7 days onwards should have high protein feed available to them (around 21% Crude Protein). This has to be fed in a small area, where the mother cannot eat the feed. The feed conversion rate of young piglets is very high and thus creep feeding is particularly economic. Creep feeding helps the piglets to get used to feeding at an early age. The sow's milk yield also begins to decrease just as the growing piglets require feed.

CASTRATION

Castration can be practiced in male piglets as a measure to prevent meat from getting boar taint-meat from sexually mature male pigs have an unpleasant odour during cooking. It is done within the first 2 weeks of the piglet's life. However, some researchers nullify the effect of boar taint on meat as most pigs are slaughtered before they reach sexual maturity.

The importance of these managerial practices cannot be underestimated or ignored in pig production. Hence it is pivotal to implement some or all of these practices within pig enterprises to maximise on production. Good neonatal care practices translate to improved profits of the enterprise.

James Kabinda is an Animal Production Specialist with a degree in Animal Production and Technology from Chinhoyi University of Technology. For any livestock questions contact +263774225873, or email: jameskabinda@gmail.com

For more articles on pig management, refer to;
ZiMunda Farming Issue 2 - Creep Feeding by Chris Grant;
ZiMunda Farming Issue 6 – ZAPG Tackling Constraints Faced by Small to Medium Scale Pig Producers;
ZiMunda Farming Issue 13 - Expert Advice on the Causes and Management of Mortality in Piglets by the Pig Industry Board of Zimbabwe;
ZiMunda Farming Issue 19 - Wet and Dry Feeding in Pig Production by Lucy Chipondoro, Animal Nutritionist;
ZiMunda Farming Issue 21 – Breeding Care - Pig Management Practice by Tanaka C. Chaza, Agricultural Literacy & Advocate Specialist.

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Causes of Respiratory Infections in Poultry

By General Beven Mundida,
Livestock Consultant.

QUESTION: WHAT COULD BE CAUSING MY CHICKENS TO HAVE BREATHING DIFFICULTIES?

ANSWER: If a bird has trouble breathing, there is a likelihood that it is suffering from a respiratory infection. For the safety of the flock, it is of paramount importance to engage biosecurity protocols by;
1. Separating the sick bird/s from the rest of the flock and keep it in a warm environment with good airflow, and give it electrolytes and/or a vitamin supplement.
2. Vigilantly monitoring the rest of the flock for similar symptoms.

The typical symptoms of respiratory illness/infections in chickens include runny nose and eyes, sneezing, wheezing and coughing. The sick chicken may also suffer fatigue and loss of appetite. There exist a number of causes for respiratory infections in chickens and these include;

• Poor Ventilation
Poor ventilation and a stuffy dusty environment can cause a sudden increase in upper respiratory infection in chickens. Correct airflow is then fundamental to the health and productiveness of a poultry flock.

Ensure that the chickens get fresh air in the poultry unit, by removing any buildup of dangerous gases during the day and night. Carbon dioxide levels should never exceed 2500ppm while ammonia levels should be below 20ppm. If you find yourself shedding tears in a poultry house full of wet litter, it is an indication that ammonia levels are too high. You need to remove any wet litter and replace it with dry friable wood shaving.
- Make a habit to turn the litter once per day!

• Contaminated Drinking Water
Water is the single most important nutrient in the life of any living organism and its cleanliness can be easily overlooked in a livestock production system. Water contaminated with *E. Coli* or coliforms can be a leading cause of respiratory infection in poultry. Drinking water should be readily

available to the flock at all times. It must be fresh, clean and free from disease-causing organisms. Treat the water with chlorine tablets at least once a week. To avoid the buildup of biofilms in the water lines, periodically flush the water pipes are with hydrogen peroxide even when the birds are in the unit.

• Bacterial Or Viral Infections

Infections caused by Mycoplasmas (bacteria), *E. Coli* (Bacteria), Aspergillosis (Fungus) and diseases such as Coryza, Newcastle and Infectious Bronchitis exhibit clinical signs of breathing difficulties in poultry. You are advised to seek intervention from a veterinarian to make a flock appraisal and a physical examination. The physician should be provided with a complete flock history in order to rule out any early infection. The flock history should include a record of the clinical signs of any disease that you observed, feeding space, flock density, water consumption, vaccination programme, bio-security levels, environmental hygiene levels, pest and rodent control protocols.

- Live vaccinations, like for Newcastle, Infectious Bronchitis, and Gumboro, may elicit upper respiratory reactions. Pullets will show similar clinical signs without responding to any antibiotic treatment.

• The Chilling Effect

Although birds fully develop feather cover by seven weeks and can withstand low temperatures, any drop below 17 Degrees Celsius can have an impact on the health of the birds due to chilling stress. Monitor and ensure the night temperatures are bearable and if they are not, you can add sources of heat in the brooder or have a separate in-house brooder for the pullets.

- Layer pullets are extremely sensitive to a sudden fluctuation of temperatures.

TREATMENT AND CONTROL

- The liberal use of antibiotics is not recommended for food animals. Antibiotic treatment should only be administered after an extensive investigation by a veterinarian.
- Viral infections cannot be treated by the use of antibiotics.
- Breathing difficulties that arise from poor flock management can only be controlled by paying attention to the four inputs; good air quality and environment; dry and friable litter; good quality water; and a correctly balanced nutrition.

Question from Talent Muchuwa, Murambinda. To have your livestock questions answered call/ WhatsApp +263 776 420 161 or email, gbmundida@gmail.com

Image provided by Mrs Muroiwa