

ZiMUNDA

FARMING

NEWSLETTER

ISSUE 19 | **MAY 2021**



AGRONOMY

Winter Cropping
- Wheat

LIVESTOCK

The Boran
Breed

POULTRY

Managing Brooder
Environment

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The aim of ZiMunda Farming is to provide correct and relevant farming information to farmers. Every effort is made to check the content of every article, the directors will thus not be held responsible for errors or omissions in such articles. Farmers should thus consult with the references and resource people before making any financial or production decisions.

COVER

Soya bean harvesting at the Agricultural Research Trust, Harare





The Boran Breed - "God's Gift to Cattlemen"

— By Vimbai Ruvengo —



A Pure Boran Bull

The foundation of animal production is in the breeding herd. Effort should be made to select those animals that possess traits that lead to long life, high reproductive efficiency, efficient conversion of feed into meat, and a type that will produce a desirable carcass.

HISTORY OF THE BORAN BREED

The Boran developed in eastern Africa, more specifically the Borana plateau in southern Ethiopia. This area was where all the different breeds migrated through to their various destinations in Africa. The Boran developed into the dominant breed of eastern Africa, and is kept primarily for beef production in semi-arid zones.



Left - Branding of cattle that meet the Boran standards of excellence - to be registered in the Zimbabwe Herd Book

WHY THE BORAN BREED?

Commercial cattlemen prefer the Boran to *Bos taurus* breeds because of their relative adaptability to the local environment, achieved through generations of natural and artificial selection in conditions of high ambient temperature, poor feed quality, and high disease and parasite challenge. Boran cattle have developed adaptive traits of crucial importance for their survival. Some of these characteristics are the ability to withstand periodic shortage of water and feed, ability to walk long distances in search of water and feed, and the ability to digest low quality feeds. The herd instinct of the Boran makes it easy to manage and survive in bush country as they will always stay together. The Boran is popular for its ability to convert poor quality roughage into excellent quality meat. It is an animal which fattens quickly and thus is ideal for fattening off the grass and does very well in a backgrounding program.

BREEDING BORAN INTO THE HERD

The genetic composition of the Boran is unique, making it your best choice for cross breeding:

- European *Bos taurus* - 24%
- *Bos indicus* - 64%
- African *Bos taurus* - 12%

As far as can be determined this is the only breed in Africa to have this specific combination of genes.

GRADING UP – BORAN CATTLE

The *Zimbabwe Boran Breeders Society* has an appendix system which allows for grading up of commercial cattle. This requires a purebred Boran bull (or semen for AI) bred onto a suitable base of “foundation” cows of any other breed.

Appendix A Boran - The purebred Boran bull is mated to these foundation cows. Any resulting bull calves can be removed from the breeding programme, but the heifers are to be retained. These females are now genetically 50% Boran and 50% of the base breed; they are known as Appendix A Boran.

Appendix B Boran - These Appendix A females in turn are mated to a purebred Boran bull and the heifer calves retained as Appendix B Boran; which are now genetically 75% Boran and 25% original breed.

Appendix C and SP Boran – By repeating the above process two more times an animal is almost 100% Boran. At this level heifers admitted to the Zimbabwe Herd Book are considered purebreds. Bulls however, undergo more scrutiny to be registered as a purebred.

Image - Visual Inspection
by ZBBS at Thornhill Farm,
Beatrice.

CONFORMITY AND BREEDING STANDARDS

The Society sets and maintains standards, which are applied by a panel of inspectors. Only after inspection and approval can a Boran be considered registered in the Zimbabwe Herd Book. Inspectors will reject any animal showing a foundational or structural defect such as excessively pendulous sheaths, lack of pigment, faulty feet and legs, temperament and abnormalities of any description. Visual evaluation is an important part of the selection process. It can be a good indicator of the size, muscle and body structure, feet and leg structure, as well as breed character.

The Boran is medium in size with a short head, small ears, loose dewlap and a large hump above the shoulders. They can be horned or polled. They vary in height from 114cm to 147cm tall, and bulls weigh approximately 500kg to 850kg. Cows weigh about 380kg to 450kg. Their skin is loose, thick, and extremely pliable for added insect repellence, and it has dark pigment with fine short hair for heat tolerance. Hair colour can be a range of colours.

The ability of the individual animal to meet these requirements is due to genotype and environment. Today, production records are used to determine the genetic potential of an animal and that animal's response to the environment. Records, however, do not tell the complete story. Physical characteristics of the animal are still important. The animal has many features that aid in predicting its value in the breeding herd. It takes training of the eye and mind to detect and evaluate these features so that one animal can be measured against another. This comparison enables ZBBS inspectors to advise on which animal will best fit into a profitable breeding program.

For more information on becoming a member of the ZBBS and to register your Borans, please email admin@boran.co.zw.





ZBBS

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Goats.Africa

By Amy Hart, Director at Goats.Africa
(Pvt) Ltd, Blue Ridge Centre, Goromonzi

Goats. Africa was created in 2019 with a vision to create a centre where people can buy goats, get supplies, receive support, and always feel welcome to drop in. It was initiated to assist farmers who want to begin their goat business, those wanting to improve their flocks, and to support the many talented goat breeders Zimbabwe already has.

Goats.Africa offers a selection of pure Boer, pure Kalahari Red, and crossbred goats. The pure breeds are imported from South Africa, specifically selected to enhance the genetics in Zimbabwe, and the crossbreeds are sourced from local goat farmers. Complimentary to enhanced goats breeds, at Goats.Africa we strongly believe that training courses and information days are valuable, everyone can have a successful goat flock, farm, or business. This article aims to highlight some of the important issues to consider in goat husbandry.

GOAT NUTRITION

A well-fed animal is more valuable, more productive, grows faster, and will recover from sickness better than a malnourished animal.

Water – Provide clean water as goats are very fussy about clean water! One goat can drink 3 to 10 litres per day. A lactating doe will need more water.

Feed - Goats are mainly browsers; they eat leaves from trees and bushes although they will also graze and eat grass. They are ruminants, which means that they ‘chew the cud’. Protein is important for keeping antibodies, muscles, blood, and milk healthy. Examples of protein are acacia pods, beans, cowpeas, lucerne, soybean meal, and green pastures or browse.



Energy is essential for goats to grow faster, breed, produce milk for the young. Examples of good sources of energy are maize grain, oats, sorghum, and molasses. Minerals such as Calcium, copper (very important to be a minimum of 1200ppm), phosphorus, salt (no more than 15%), and selenium (BoSe-which is very deficient in most areas of Zimbabwe). Often the easiest way to offer minerals is in block, but extra trace elements can be administered in the feed or by injection, it is always best to check with your veterinarian for correct dosages.



FEEDING HABITS

Feed is the largest cost of running a goat farming project. The most economical source of nutrients for meat goats are browse and pasture and, in some cases, these are sufficient to meet the nutritional requirements. Natural pastures are the best way to feed your goat. It is important to rotate the pasture areas daily to prevent parasite infestation. Once grazed, pasture areas should be rested for a minimum of 14 days to be free of parasites and to help with regeneration of grass. Goats are versatile, inquisitive, and energetic in their feeding habits and can adapt to different environments. They can consume over 80 different kinds of plants. A suitable area for the goat farming project should ideally have low bushes, as goats enjoy browsing materials like trees, bushes, twigs, and leaves.

A CLOSED CYCLE

At Goats.Africa we operate and promote a holistic view of keeping goats in sync with regenerative agriculture practices and in the belief that goats are perfectly designed for the connection between animal, plant, and soil. Goats promote life in the soil by eating what other animals will not. They recycle grasses, bushes, weeds by their unique chewing action and put them back into the soil through manure. Goats trample the ground that acts like “tilling”, all the nutrients go back into the soil and make it easier to hold water. Goats are good living machines that can clear areas for fire breaks, clean areas around waterways, and open up overgrown lands while rejuvenating the soil for vegetation to thrive.



SUPPLEMENTARY FEEDING

Even though goats will browse and feed on pasture, you might have to give them supplementary feed at certain times as enough pasture might not be available throughout the year due to seasonal changes. We choose Icefeed Lamb Maintenance as our base commercial feed, it's 17.5% protein and specifically designed for sheep and goats combined with lucerne pellets from Mzilikazi Stud in Bulawayo. We also always offer our goats the Icefeed 25kg Winter/Summer block which is formulated with most of the essential vitamins, minerals, and trace elements that goats need. Our flocks are on commercial feed for critical feeding times: before mating (bucks and does), late pregnancy (last 6-8 weeks) to avoid abortion, weak or small kids, early lactation (to ensure doe has enough nutrition to produce milk for the kid), and creep feeding kids for good growth. The amount of supplementary feed will depend on their body condition but you can roughly work on between a minimum of 200g up to a maximum of 1 kg per goat per day. Hay is also a great way to add nutrition when the grazing/browsing is poor, ensure that the hay is free of mould and dust. Do not restrict access to the hay unless goats are wasting it.

HANDLING EQUIPMENT

Handling equipment is an important part of goat farming. It does not need to be expensive. The essentials are a sturdy water trough, feed trough, and a secure night-time enclosure to prevent predators and theft reducing your flock. Goats do not require complicated housing since they are very adaptive animals but any housing should have good ventilation and be kept clean. Goats Africa manufactures a 3.6-meter lightweight mobile panel that is attachable to form a pen. The advantage of a mobile pen system is that the pens can be moved onto new pastures which promotes good hygiene and parasite management. Other recommended facilities are a crush/race, which provides a safe and efficient way to capture goats for dosing, vaccinating, and counting.

Hoof trimmers, ear tags, dosing syringes, castration equipment, which can all be acquired overtime when needed. Most local veterinary supply shops offer this equipment and ear tagging kits are available from Goat Breeders Association of Zimbabwe located at the livestock office in the National Show Grounds.

ABOUT GOATS.AFRICA

Goats. Africa's main sales centre is located at Blue Ridge- 9km outside the Shamva tollgate on the Mutoko road. We are open every day, our staff are always happy to answer questions and we run regular one day courses at our sales centre for farmers and herders. For more information on Goats.Africa; call +263 78 797 6011/ +263 77 482 0514; Email: info@goats.africa ; or visit us at the Blue Ridge Centre, Goromonzi, Mutoko Road, Zimbabwe. www.goats.africa

Backlinks - For more information on creep feeding, refer to [ZiMunda Farming Newsletter issue 2](#) by Chris Grant. For more insights on general goat farming, refer to [ZiMunda Farming Newsletter issue 4 and 14](#); articles written by Gay Stead, Paddy's Valley, and Christine Zimbango, Rarecray Farming, respectively.

Images provided by Amy Hart



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Wet and Dry Feeding in Pig Production

— By Lucy Chipondoro, Animal Nutritionist —

High feed intake is central to obtaining optimum performance in weaned pigs, and efficient food conversion is central to minimising costs. Newly-weaned pigs often show low levels of feed intake during the post weaning period, this may reflect difficulty adapting to a solid diet and to using a feeder for the first time. In addition, stress associated with separation from dam and littermates, mixing with unfamiliar animals, and relocation to a new environment may contribute to reduced feed intake hence the use of wet feed increases the feed intake.

To support a gradual transition, a wet feeding system should be considered as this system delivers liquid to paste-like feed with a consistency which is optimal for the nutritional requirements of piglet.

WET FEEDING

Wet feeding includes dry and wet, paste, and liquid feeding. These are slightly differing in terms of the ratio of water added to the dry diet.

Dry and wet feeding uses a feeder, called a single space wet/dry feeder (SSWD), where feed and water are available in the same feeder. With modern SSWD feeders, growth rates were increased with meal and pelleted diets. The improvement of growth rate is largely related to the increase voluntary feed intake and feed wastage is reduced, thus improving feed efficiency.

Paste feeding is similar to liquid feeding, but water and feed are mixed at a ratio of 1.1 to 1.5, forming a paste material.

In **liquid feeding** the ratio of added water in dry diet is higher than paste feeding.

ADVANTAGES OF WET FEEDING

- The advantages of wet feeding include increased feed intake, improved growth rates, greater feed efficiency, and reduced wastage of feed and water.
- It reduces dust during feed handling and feeding, this in turn gives a healthier atmosphere for the stockperson and the pig.
- Lactic acid bacteria, which occur naturally on cereal grains, will multiply in the wet mix, making the feed more acidic. This is of benefit to weaner pigs, as the lactic acid bacteria prevent the multiplication of other harmful bacteria in the feed. The microbial activity will stabilise gut microbes with protect against harmful bacteria, production of anti-microbial products in the gut

CONSIDERATION ON LIQUID FEEDING

Fermentation - Liquid ingredients and finished feeds are prone to fermentation. If left uncontrolled this can adversely affect feed intake and growth performance of piglets, as they are particularly sensitive to unpalatable feed, whether wet or dry. The level of hygiene required to achieve good results from liquid-fed weaners must be high.

Effluent output can be higher when liquid feed is used because of the extra volume of water consumed by the pigs. However, the quantity of waste nitrogen and phosphorus excreted by liquid-fed pigs is not increased compared with dry feeding, and furthermore can be reduced by phase-feeding and the application of feed enzymes to improve digestibility. Phase feeding is a term used to describe the feeding of several diets for a relatively short period of time in order to closely meet the pig's nutrient requirements. When one diet is fed for a long period of time, it is usually under the young pig's nutrient requirements and over fortified for the older pig.

RAW MATERIALS IN LIQUID FEED SYSTEMS

A range of materials which can be used in liquid feed systems are unripe cereals such as Corn Cob Mix, crimped cereals and legumes, and "humid maize". All of these crops are harvested at 30-40% moisture content and are then processed by milling or crimping and ensiling. CCM or Corn Cob Mix is created by threshing corn with a moisture content of 35-40% and subsequently grinding the grains. Because the product is used in pig farming, the crude fiber-rich flask is not milled.





DRY FEEDING

In many operations today, rearing piglets are fed with dry feed. This method offers a simple feeding technology and is a hygienically favourable supply of feed. In the classic dry feeding situation, the feed is supplied to the piglets from the start (after weaning) *ad libitum* (available at all times) and dry. The piglets have to salivate the feed a lot more resulting in the feed intake rates being slower than with porridge-like or liquid feed. It is important to make sure that there is a sufficient intake of water via easily accessible drinkers, as piglets repeatedly switch between the feeder and the drinker while eating. If the piglets do not take in sufficient water, the feed intake might decrease. In order to lower the risk of diarrhoea, it is recommended to work with additional feeding places like hand-feeding bowls in the first few days. This is done to facilitate the transition from the rationed milk intake at the sow to *ad libitum* feeding at the pig feeder.

Each of these systems can support piglet growth; however, the conditions on a farm, individual requirements of the producer, as well as the specific feed components are decisive factors of whether a wet feeding or dry feeding system is to be installed.

Images provided by Zimunda Farming at the Pig Industry Board Farm, Harare

PIG FEED FORMULATION

Formulation is the process of creating a recipe by combining the various feed ingredients such as rice bran, broken rice, wheat, maize cash, oats, barley, dried cassava, baby corn, soybeans, by-products from the brewing industry, starch industry and dairy industry, vitamins and minerals.

The formula should permit mixing ratios of the feed ingredients in proportions that will satisfy the pig's nutritional requirements. The key nutritional elements of the diet to ensure pig growth and health are: water, energy sources carbohydrates and lipids, protein and peptides, minerals, vitamins and functional fibers. Energy is mainly provided by carbohydrates and lipids, essential amino acids lysine and tryptophan. Pigs cannot digest large quantities of forages as they are monogastric animals. Select the proper pig feeders, because the right feeder can greatly help pig feeding efficiency. Feeding equipment include automatic cylindrical pig feeder, dry wet pig feeder suitable for mash and pellets feedstuffs; feed troughs for sows, piglets, and fattening pigs.

Information Required for Feed Formulation

1. Nutrient requirements of an animal with respect to performance targets.
2. Nutritive value of raw materials.
3. Cost of raw materials.
4. Restrictions due to anti-nutritional factors.

Major anti-nutritional factors, which are found in edible crops include saponins, tannins, phytic acid, gossypol, lectins, protease inhibitors, amylase inhibitor, and goitrogens. Anti-nutritional factors combine with nutrients and act as the major concern because of reduced nutrient bioavailability.

5. Substitute raw materials due to seasonal availability.

The feed formulation is tailor-made according to the pig live weight;

Pig starter - A ration to be fed from weaning to about 35kg live weight.

Pig growth meal - A ration to be fed from weaning to about 35kg live weight.

Pig finishing meal or breeding meal - A ration intended for pigs over 35 kg live weight.



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The ART of Farming -The Final Reckoning

— By Rob Jarvis —



April to about August are crucial months for most mixed commercial farming operations in Zimbabwe. This is the litmus test, budgets and previous history all tell a story, but reality is wholly governed by what you take off the field and put into a bag or bulk truck and trailer and deliver to market.

Actual field activities are in response to the weather, weeds and pests experienced contribute to success or failure to stay afloat. Many of us do not have a choice about where we deliver the bulk of the crops we harvest. Usually this is determined by the supplier of cash or inputs to grow the crops with the banks in Zimbabwe failing heavily in this regard in recent years. Bigger growers are tempted by the grand schemes offered by the authorities and if you register early enough, draw your inputs in time and get favoured delivery schedules, then it is a useful route to follow. We signed up some crop on the Command Agriculture scheme, but we were late applying and our tonnage did not put us in the elite channel dealing through Aspidale and it turned out that other than some urea, we hardly drew any other inputs. But the contract is there with a tonnage spelt out clearly and a final date of delivery so we will meet our commitment and hope it will favour us for better service next season.



Recent legislation has meant that contracted crop and inputs supplied by the contractor, need special letters from the overall authority governing crop production and buying in Zimbabwe allowing deliveries outside the Grain Marketing Board depots to take place. Exactly how well this will work is yet to be seen and we are still awaiting our letter allowing delivery to a major brewing company that provided all the inputs, including fuel, to grow a maize crop.

The unusual, and as it turned out for us at ART, a less than normal rainfall season has resulted in a concertinaed harvest season. The maize and later-planted soyas need harvesting at the same time. Limited rain in November meant we only just got the maize crop away on time but the soyas ended up being planted with the real rains that came mid-December. Then the rains cut off in mid-February. Soyas, you just have to get off, there is no leeway because the pods are designed by Nature, to split or shatter once dry and spread the seed widely on the ground. Picking them up is impossible thereafter.



On the other hand, maize, you can leave standing on the plants, maybe even for months at a time, or you can cut the stalks with cobs attached and stook them in wigwam-shaped heaps in the field until ready to shell. In our case at ART, we are exposed to rampant theft opportunities with the whole entity stretching some 5 kilometres from North to South with fairly densely populated housing estates close by on either side. Neighbour's fencing went with the organisation and dedication of previous land-owners and we have no choice but to employ security people to try and police the crops in the field and hopefully limit the losses prior to harvest. It is an endless battle.



Luckily Agribank has purchased vast fleets of combine harvesters to try and encourage the return of Zimbabwe to self-sufficiency. They have many other pieces of equipment too available from tractors to planters and I am sure that

like us, many a farmer will turn to equipment hire for an increasing amount of work on the commercial hectareage. Hopefully the land bank will make sure that this equipment is well-serviced and maintained and driven by equally well-trained drivers and assistants. It really doesn't make sense for farmers to sink hundreds of thousands of United States dollars into harvesting equipment which is only used for a month or so each season. Better that burden is carried by

specialist organisations and farmers concentrate upon the growing of crops and the raising of livestock.

And so, we hire, harvest and wait with bated breath to see what we can deliver or store in our grain silos. Boards expect budgets to be met and better yet, exceeded.

Images provided by Rob Jarvis at ART Farm, Harare

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Time to Swap Seed

— By Sara Davies —



The Big Seed Swap is a remarkable event where diverse heirloom varieties can be found. These are seeds which can be saved each year and will grow true to type. Many also have a story behind them, passed down from generation to generation. Black chickpeas, multi-coloured popping corn, horned melon, loofah and holy basil, along with many others are what you would have found if you were able to attend. All seeds were free as long as you had something to exchange in return.

Held on the 24 April 2021 at Ela The Garden café in Newlands, Harare, this was the third event of its kind organised by the Zim Seed Savers. Essentially it is a chance for a very active WhatsApp group of passionate seed savers to gather physically to exchange seeds and knowledge about them. However, in the spirit of sharing, it's open to the wider public too. There's a strong ethos of reciprocity behind the event, everyone who comes should bring something to swap. Over the course of the 3 hours of the event approximately 50 people passed through. The enthusiasm was palpable.

In a world increasingly dominated by a handful of seed companies, these seed swaps offer gardeners and farmers alike the opportunity to find a variety of seeds that are not available commercially. The importance of saving seed cannot be underestimated in ensuring genetic diversity. Hybrid and genetically modified (GM) seeds cannot be saved to be grown in the next season as the subsequent crops are not predictable. The act of saving seed also increases our resilience in the face of climate change.

The Big Seed Swap also welcomes first timers with a new interest in seeds. *“At first I was a little bit shy about turning up as an amateur - asking ‘obvious questions’ - but I was pleasantly surprised,”* said Natasha Kusema, a first-time attendee. *“Everyone was really accommodating and kind. People really took the time to explain what they had at their table and how best to grow it.”*

Of course, there were those who brought more and those who brought less but the exchanges went well. Importantly no money exchanges hands – unless you count the coffee or delicious meals purchased from the venue itself.

“The seed swap has seed exchange at its centre and other beautiful exchanges happen around it,” explains Rekayi Katerere, who's been to each one of the events.

Saving and sharing seed is such a physical act however Zim Seed Savers' plan to have a quarterly event after the success of the first event in February 2020 were sadly dampened by the emergence of Covid and subsequent lockdowns. Zim Seed Savers hope to be able to put these plans back on track so that this event becomes a regular feature on Harare's growing calendar. The idea is that as people become more used to saving seed, they will multiply them up to share at future events.

“The event is good let's keep it alive until we reach to maximum level of Indigenous way of seeds selection and storing them,” said Tichaenzana Koke, one of a group who came to the swap from Kufunda Learning Village. *“We gave dandelion, calendula, pumpkin, chia, artmisia, and amaranth seeds, as well as zumbani plants. We got abidal acacia, pecan, granadilla, pawpaws and butter beans seeds, and turmeric plants.”*

Vongayi Mashingaidze from the Tree Knowers and Growers agrees. *“I always look forward to such events. They are so empowering, inspiring, nurturing, and priceless.”*

For more information on future events please visit the Zim Seed Savers Facebook page.



Building Better Soils and Bigger Roots

— By Damara Bio- Agri —

When looking at the so-called “low hanging fruit” in achieving sustainability, improving soil fertility and growing resilient, healthy crops are the first things that farmers need to address.

A **comprehensive soil amelioration** approach which aims to improve crop production, by unlocking nature's full potential, would focus on the following aspects; physical and chemical attributes of soil compaction and aeration, microbiology and humus, and water holding capacity.

GEO-REFERENCED SOIL ANALYSES

In order to address soil physical and chemical issues of the soil, detailed geo-referenced soil analyses need to be done. The main reason for this is to be able to address the shortcomings of the poor yielding areas on a field and to focus the ameliorates only on the portions of a field that show deficiencies or imbalances. The first critical step in improving soil fertility is to address **soil acidity**. To address soil acidity, one can apply lime. The key factor when considering liming, is the reactivity of the lime and this is determined by purity and fineness of the lime. **Granulated micronized lime** is a highly reactive and user friendly option to consider, especially when logistics are expensive and long term access to land is not guaranteed. The choice between dolomitic and calcitic lime needs to be guided not only by the acid neutralisation capacity of the lime, but also by the Calcium to Magnesium ratio of the soils. The reason for this is that Calcium is a very big ion, and in solution, it moves in-between the soil colloids and flocculates the soil. Magnesium has the

opposite effect and disperses (compacts) the soil. Therefore it is important for optimal aerobic soil conditions, to try and achieve a 4:1 base saturation ratio of Calcium to Magnesium.

Left - An agronomist from Damara Bio-Agri assessing the soil profile.



It all starts with building better soils, that are conducive to bigger roots, which results in healthier crops.

SOIL COMPACTION

In order to achieve big roots, it is essential to have a well aerated, non compacted soil, throughout the whole soil profile. The causes of compaction can be linked to soil type, chemical composition, tillage practices or a lack of organic matter. Surface crusting is mainly caused by high silt content, low organic matter or a lack of calcium. To address soil capping, retaining organic material on the soil surface is step one, which can be followed by adding soluble Calcium products which help to break the crust. Planting a cover crop with a deep root system is also a very efficient way of breaking soil compaction.

BUILDING HUMUS

Furthermore, crops that photosynthesize optimally produce excess photosynthates which are leached via the roots into the soil. The microbiology in the rootzone is stimulated by these root exudates to perform essential plant and soil functions, of which the building of soil aggregates and humus are core. Planting a mixture of various cover crops speeds this natural humus building process up by hosting a wide variety of soil microbiology. This process needs to be driven by saprophytic fungi, which are specialists in converting organic material into plant available nutrients and humus. These saprophytic fungi often get killed by chemical fungicide and herbicide sprays. So it is important to re-inoculate the organic matter with saprophytic fungi like Trichoderma Aspergillum.

WATER HOLDING CAPACITY

Lastly, the water holding capacity will be dramatically improved if the soil fertility boosting steps are implemented. By addressing soil acidity and compaction, and building humus in the soil, the water infiltration rate will also be dramatically increased. This will mean less run-off or erosion, and more rainfall water captured in the soil per rain event. These actions will reduce the occurrence of moisture induced stress and will carry the crops through seasons with sporadic rainfall.

For more information on Soil Amelioration and Soil fungi, refer to ZiMunda Farming Newsletter Issue 16.

Below - A field where soil samples were taken



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Wheat - A Crop in Season

By Wendy Madzura,
Agronomist, SeedCo

In Zimbabwe wheat is the second most important cereal crop after maize. The annual wheat consumption is above 400 000mt yet wheat imports of around 80% are made each year. It therefore goes without saying that the winter wheat season that has arrived brings with it a blank sheet waiting to be filled up by each farmer at the end of the season depending on the output.

PLANTING TIME

For any cropping venture to be successful it is important to start on time. The optimum planting dates for wheat are from the last week of April (in lowveld areas) to the end of May. However, the highest yields are obtained when establishment is done within the 1st 2 weeks of May. Planting on time enables farmers to avoid frost conditions during critical growth stages of wheat like flowering, to avoid high disease and pest pressure during the months of August and September when the crop is in post anthesis stage (grain filling). Early planting also allows the tillering stage to coincide with low temperatures during the month of June. Low temperatures and even frost at this stage, promotes tillering. Observing the planting window allows farmers to harvest their crop before the next cropping season. One of the main advantages of planting on time is that farmers can harvest their crop before the onset of the rainy season. Rain induces sprouting in wheat (Pre-harvest sprouting), thereby reducing the falling numbers which affect the baking quality. Farmers should strive at all costs to establish their wheat seed during the recommended planting window. If the planting window is missed, the consequences can be dire.

IRRIGATION AND IRRIGATION EQUIPMENT

Wheat is a temperate crop grown pre-dominantly in winter in Zimbabwe. The nature of Zimbabwe's rainfall pattern means that wheat is established purely under irrigation. For this reason, a farmer thinking of embarking on a wheat cropping venture needs to carefully assess and determine their irrigation capacity. The total amount of water required to irrigate a wheat crop falls in the range of 450mm to 600mm from establishment right through to harvesting. The irrigation equipment should be checked and serviced well in advance to avoid hiccups once wheat growing season start. Having ascertained this the next step is to service all equipment to be used during the establishment of crop. This therefore includes tractors, boom sprayer Vicon spreaders or seed drills. It is important to note that poorly serviced or calibrated farm machinery impacts negatively on operations resulting in poor germination, establishment and ultimately crop stand.



The picture on top demonstrates wheat planted using a Vicon spreader (Farm in Mazowe) while the picture on the bottom is wheat planted using a seed drill (Farm in Goromomzi, Mash East).

Irrigation infrastructure must be maintained to ensure there is no water leakages and blockages along the water delivery system.

GOOD QUALITY GENETICS/SEED

During the planning stage, farmers should bear in mind that yield is a function of two things yield per plant and yield per unit area. In the yield matrix there are a thousand reasons for low yields so much that naming them would be close to impossible, however there are only two reasons for high yields; Good quality genetics/ seed and Agronomic Practices (GAP'S). Starting with the right seed variety suitable for a particular cropping region is key in increasing productivity. When selecting wheat varieties farmers should consider the following factors:

1. Disease tolerance specially to leaf rust disease.
2. Tolerance to moisture stress.
3. End use quality, key for the milling and baking industry.



4. Yield potential - Wheat yields differ depending on altitude. In Zimbabwe, white seeded wheat varieties are most commonly grown and have a high yield potential (5t – 10t) depending on altitude with highest yields recorded in the Highveld with altitudes greater than 1200 meters above sea level (masl) followed by the middle veld (800-1200masl) while lower yields are achieved at altitudes below 800 masl.

5. Crop stature - Morden wheat varieties are equipped with defensive agronomic traits like a short statured stem and good tolerance to periods of dry spells owing to irregular irrigation. Short statured wheat varieties enable farmers to punch in high plant populations without the risk of lodging. This results in an increased number of plants per unit area, resulting in an ultimate increase in yield. Modern wheat varieties on the market include **SC Select, SC Serena and the traditional workhorse SC Nduna.**

AGRONOMIC PRACTICES (GAP'S)

Soil Conditioning - Soil conditioning is best achieved after soil sampling is conducted to ascertain the state of the soil in terms of soil pH levels and the soil nutrient status. Soil testing ensures effective conditioning and gives a custom-made fertiliser recommendation. Soil conditioning is done during land preparation to incorporate the soil with the recommended soil conditioner as stipulated by soil analysis – mainly liming. Land preparation should be done until a fine tilth is obtained to promote good seed to soil contact. Good seed to soil contact results in a high germination percentage resulting in a good crop stand.

Planting - Once soil conditioning and land preparation is done; the next step is to irrigate to field capacity before planting or soon after planting. This gives good germination of the wheat seed. The seed rate for wheat depends on the method of planting to be used. When a precision, well calibrated tool like a seed drill is used the seed rate ranges from 110 – 125 kg per ha, while 125 to 135 kg per ha is used when using a broadcasting tool like a Vicon spreader. Other farmers are establishing at higher seed rates; however, it is recommended that a proper cost benefit be done to understand the cost implications of increasing the cost of production on the productivity level to be obtained. Farmers are encouraged to come in with a light irrigation or light disking at 4 to 5 days after planting particularly in soils with a high silt content to break the crust layer formed on the surface of the ground. This layer may affect germination of the wheat resulting in a poor crop stand.

Wheat Hardening - Once germination is complete farmers should starve their wheat crop of irrigation water to promote tillering and initiate the development of crown roots. This critical stage is termed “hardening” and it differs for sand soils and clay soils because of differences in water holding capacity. In sandy soils hardening can last for about 10 days and 14 days in clay soils. The aim is to strengthen the wheat seedling and not force them into permanent wilting, hence farmers should exercise caution during this stage.

Fertilisation - Once hardening is complete the crop should be irrigated first before any operation is conducted to avoid further stressing the crop. Top dressing fertiliser is then applied at a rate of 350 to 500kg/ha of Ammonium Nitrate (34.5%N AN) or Urea (46%N). It is recommended to apply top dressing fertilizer in 2 splits especially in sandy soils. Topdressing can be applied at 4 to 6 weeks after sowing. After top dressing post emergent herbicides are applied depending on weed spectrum to reduce competition.

Pests, Diseases and Weeds - Farmers are encouraged to read labels on various herbicides prescribed for wheat in order to apply the right amount, at the right time for the targeted weed spectrum. Regular scouting is a must to determine insect pest problems before they reach economic threshold levels. Common insect pests in wheat include aphids (tillering up to grain filling stages) and bollworms (post anthesis up to maturity). It is important to note that insect and disease pressure increases as temperatures become warmer during the months of August and September hence adhering to recommended planting dates becomes paramount. Selection of disease resistant varieties reduces the need to spray for rust diseases (leaf (*Puccinia tritica*) and stem (*Puccinia graminis*) rusts) and powdery mildew (*Erysiphe graminis*) with a net effect of reducing production costs and increasing the return per dollar invested (profit).

The bottom line in any cropping program is the return per dollar invested (profit margin), therefore farmers should strive to optimise on productivity to push up the output value which is the yield per unit area.

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Grain Storage Silos - The Ideal Solution

This is the time of year when farmers are harvesting their summer crops and need somewhere to store their grain intended for personal consumption. Driving around Zimbabwe at this time of year, you will often see maize cobs drying out on house roofs and being stored in traditional granaries. It is a typical Zimbabwean scene. But long and short-term storage ideally needs to be weevil and rat-proof as well as dry, airtight and secure.

According to the International Maize and Wheat Improvement Centre, annual post-harvest grain losses in the sub-Saharan region are currently estimated at US\$4 billion. This is equivalent to a decade of food aid for the region, or enough annual calories for about 48 million people.

Enter the Dura Silo, one local agricultural manufacturing firm's answer to this annual problem.

A farmer can now store more grain in a smaller area, giving him greater control and making it simpler for him to monitor. Using a Dura Silo will help keep grain safe for longer and in better condition, compared to traditional storage methods.

Dura tanks come with three built in layers: a protective grey outside layer, a UV-resistant black middle layer, and a white food grade inner layer. They are currently available in three sizes - 1000, 2000 and 5000 litres. An essential feature allows for locking of the silo – ensuring all pests and unwanted guests can't get access. Pricewise, these Dura Silos are affordable, and with a 12-year guarantee, they are flying off the shelves.

Made locally from imported food-grade, high-density, virgin polyethylene, the factory can turn out a Dura Silo in about 8 minutes. Quality control checks are done on every tank as they come out of the mould.

Furthermore, the Dura Silos are light enough to be loaded on the back of a truck or 3.5 tonne lorry and are easy to transport. With nothing like this on the local market, the DripTech Dura Silo is set to become a Zimbabwean icon for every rural home.

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Picabella Rose Nursery

— By ZiMunda with Team Picabella —

Nestled in the heart of Emerald Seedlings in Harare, Picabella is a fully licensed small owner-run Rose Nursery. With its focus on excellence and quality, all rose propagation is done on site under the watchful eye of Gil Laver (BSc. Horticulture; Natal) his wife Sue and a skilled team led by Gerry Jakarasi.

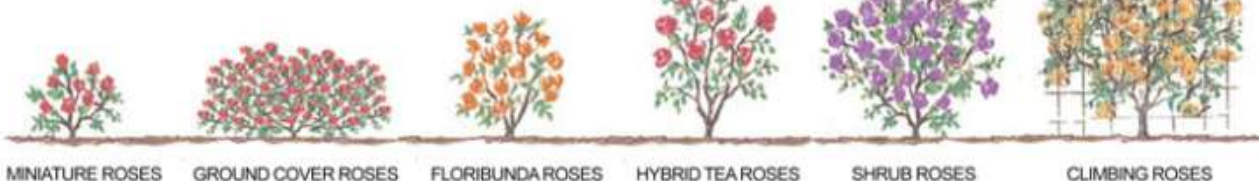
Picabella aims to produce quality garden roses at a reasonable price. Their mission is to propagate garden roses that are strong, disease free, and true to variety.

Beautiful rose gardens and green lawns grace the nursery where visitors are welcome to wander and enjoy the sight and scent of roses blooming at their best while discovering the secrets of planting and growing elegant roses for their home garden, landscape, or patio. On sale at Picabella are a range of Hybrid Tea Roses, Cluster or Floribunda roses, and delightful miniature roses. Tall Standard roses are offered for sale in sleeves along with a new range of roses in large containers. The nursery also propagates a wide range of deeply scented "Nostalgic" roses, Hydrangea, and Lavender.

Roses are among the most versatile of plants, allowing them to compliment any garden design and style. At Picabella, they are available in almost every shape, colour, and size imaginable and can be used in all aspects of the garden. With so many varieties to choose from at the nursery, the decision can become overwhelming. But, according to Gil, one has to carefully consider the following when choosing a rose;

- **The location, microclimate, and position in the garden** - fungal diseases are more prevalent in humid spaces and it is recommended that roses receive at least 6 hours of direct sunlight each day.
- **The size, growth habit, and features to best suit into your design** – rose varieties have different growth habits. Understanding the classifications of roses can help narrow down selection.

At Picabella Rose Nursery visitors receive friendly, and knowledgeable customer service from the Picabella Team. Rose lovers are encouraged to visit the "Rose Clinic" on Saturday mornings when Gil is on hand to answer questions.



MINIATURE ROSES

GROUND COVER ROSES

FLORIBUNDA ROSES

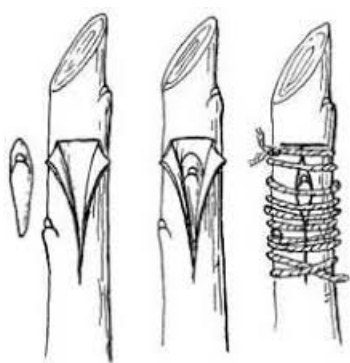
HYBRID TEA ROSES

SHRUB ROSES

CLIMBING ROSES

Seasonal Challenges of Growing Garden Roses

In April, 2021, Picabella Rose Nursery held a “Rose Chat” event about the “Seasonal Challenges of growing Garden Roses”. Gil gave an introduction on what is involved in producing a rose at Picabella; he firmly dismissed the perspective that quality roses can merely be propagated from cuttings. The team at Picabella propagates roses by grafting (budding method illustrated below) the desired flower varieties onto rootstocks (the base and root portion of a grafted plant). Rootstock roses are chosen for their ability to grow in a wide variety of soils and climates, for vigour, for ease of rooting, and how well they accept a bud. A bud-eye is taken from the desired rose plant, and grafted to the stem of a growing rootstock once its roots have been established. From graft to sale, it takes approximately 6-9 months to produce a rose plant which is mature enough to offer for sale.



The Rose Nursery prides itself in growing quality garden roses; from graft to the finished product – a process that takes almost 9 months. It's hard to beat the care given to a Picabella Rose before it is planted in the home garden.

Rose Health

Some rose growers find evidence of red spider-mite in their roses particularly during dry spells. Infestations can generally be seen at the back of the leaf; they spread quickly and do a good job of decimating the leaf. As leaves serve as a plant “food factory”, it is important to prevent and eliminate these pests. Some growers experience unsightly black spot and the mildews both Downy and Powdery which cause unsightly yellowing and leaf drop.

Team Picabella is constantly on the lookout for these common problems and Gil suggests the following:

- **Routine weekly sprays with a broad-spectrum fungicide** - Follow label instructions for dilution rates (proportions chemical/water) and precautions carefully. Failure to follow the dilution rates, can result in spray damage and rose plants will take some time to recover, if ever.
- **Always include a “wetting agent”** - Mix the spray solution with agents such as SILWET and be sure to achieve full cover of foliage, especially on the underside of the leaves. This is particularly important for spider mite as they lurk on the underside of the leaves

Feeding, Composting, and Mulching

It is important to care for your roses; strong healthy plants are less likely to succumb to disease.

- **Maintain a routine fertiliser program-** Picabella is having excellent results from its new PICABELLA GOLD granular fertiliser mix (available at Picabella). Use 30gms/1 tablespoon per bush once a month and less for mini roses.
- **Top up with compost-** Picabella Rose Nursery recommends Diana's Huku Mombe compost.
- **Mulch around the plant (using grass, leaves, or straw)** - this keeps the moisture in and keeps the sun off the feeder roots that nourish the plant.

Lastly, a gentle reminder; no digging around the rose plants as this will disturb the roots and restrict the uptake of nutrients and water; your plants will weaken as a result.

For more information about Picabella Rose Nursery, call 0773 208 032 or visit the nursery at Calgary Close, Off Alpes Road past Wingate Golf Club. Open weekdays 8.00am – 4.30pm; Saturdays until 12.00pm; closed on Sundays.

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A Guide to Profitable Mushroom Farming

— By Kantry Farm Systems —

Mushrooms also known as hohwa in Shona are an old-time delicacy that has been enjoyed throughout Zimbabwe and the African continent as a whole. Traditionally the mushrooms are picked from the forest, during the rainy season; these are called Wild mushrooms. They come in different types, shapes, and shades, some being edible and others being poisonous mushrooms. With the advent of modern-day technology, mushrooms can now be grown in farms under a controlled environment.

MUSHROOM FARMING

Mushroom farming is the controlled growing of mushrooms for household and commercial use. Whereas the conventional picking of mushrooms from the wild is mostly limited to the rainy season, mushroom farming can be done throughout the year under a controlled environment; Mushroom Growing House (MGH). The MGH brings together all the different and numerous facets required for the successful cultivation of mushrooms, into one growing room, specifically and simply designed to cater for heat, ventilation and air conditioning.

WHICH ARE THE CULTIVATED MUSHROOMS?

It is important to note that mushrooms are not plants, but are fruiting bodies belonging to the kingdom fungi. Unlike plants, fungi lack chlorophyll, the green pigment in leaves and do not photosynthesise. Instead, fungi feed by secreting extracellular enzymes to decompose their food, hence they can be idly divided into primary and secondary decomposers. The two most common mushroom species currently being cultivated in Zimbabwe fall under these categories; oyster and button mushrooms.

Oyster mushrooms (*Pleurotus ostreatus*), is the most commonly cultivated type of mushroom. It is shaped like an umbrella and the fruiting body grows large in a flower-like manner with the grey and white colour. They are primary decomposers as they can directly feed on their waste as is.

Button mushrooms (*Agaricus bisporus*) are the typically shaped mushroom, with a flat shaped fruiting head, expensive to cultivate and high market price. White button mushroom is the commonly cultivated type. They are secondary decomposers; they cannot feed directly on agricultural waste, but first need it to be decomposed so that they can access the nutrients.

MUSHROOM SPAWN

Mushroom cultivation has been made possible by the use of mushroom spawn. As seed is to a plant, so is mushroom spawn to mushrooms. Mushroom spawn, incorrectly referred to as 'the mushroom seed', is a highly pure end product made under strict aseptic conditions in a biotech-laboratory setup. As one can imagine, this very sensitive product determines the success or failure of the entire mushroom production process. Bad or poor-quality spawn has led to the downfall of many beginning farmers. To this note, spawn should only be obtained from reputable suppliers such as Kantry Farm Systems in Harare, Zimbabwe.

The significance of mushroom spawn transcends mere product quality and yield, relatively it serves as a benchmark and the foundation that allowed modern day mushroom cultivation to exist as we know it today.





This has nonetheless not dismissed the traditional way of picking mushrooms as we have a number of people who harvest/pick mushrooms from the wild. Picking from the wild is however limited only to the rainy season albeit the risk of picking poisonous mushrooms. Mushrooms are only as poisonous as what they feed on. With this, we may firmly make the assertion that cultivated mushrooms are not poisonous unless by malicious contamination of spawn and agriculture waste (substrate).

MUSHROOM SUBSTRATE

The mushroom substrate is the 'food' that the mushrooms feed on. It consists mostly of agricultural waste that include, but not limited to; cereal straw, cotton waste, legume remains, etc. Secondary decomposing mushrooms such as button mushrooms require some animal waste in addition for instance composted chicken and horse manure.

OYSTER PRODUCTION

Oyster mushroom is the most commonly cultivated type of mushroom and is generally recommended for beginners. It grows well in temperatures ranging from 18°C to 25°C. The standard harvest time is 5 weeks from the day of cultivation. Its growth phases generally consist of 2 stages namely incubation and fruiting.

Incubation is the first stage which usually lasts for 4 weeks and requires warm temperatures ranging from 22°C to 25°C. At this stage the mushroom mycelium feeds on the substrate in a process known as spawn run. Incubation should take place in a dark room with high carbon dioxide levels, so basically close all windows and doors for this whole stage. The mushroom bags become white as this stage progresses.

Fruiting - Soon after the incubation stage, the mushroom mycelium is now ready for fruiting. To induce fruiting, the mushrooms need lower temperature, humidity, and light over a period of 1 week. The temperature should be lowered to 18°C to 22°C. The mushroom bags should be watered regularly. Ventilation and light must be allowed inside the growing room. Holes are pierced all over the body of the bag for the mushrooms to protrude, this process known as pinning. After the mushrooms have started coming out, carefully harvest them before the head of the fruiting body grows too large.

BIOSECURITY IN MUSHROOM PRODUCTION

Mushroom is a very sensitive crop and requires a high level of hygiene throughout the production procedure. Workers and equipment should constantly be disinfected with rubbing alcohol and hypochlorite solution (jik solution). Due to the sensitive and unique nature of mushrooms, no chemicals/insecticides/pesticides should be used in the MGH or cultivation process. This is because these chemicals can easily be absorbed and incorporated into the fruiting body of the harvested mushroom.

GETTING STARTED

Oyster mushroom farming is a cheap to start and highly profitable enterprise. Contrary to common misconception, the mushroom market is still by far largely untapped. One can start this business and be harvesting in a month's period. If 1 month sounds too long for some farmers, consider 1 week. Yes, you heard it right! Kantry Farm Systems has developed ready to fruit oyster mushroom kits for the first-time mushroom farmer. These mushroom starter kits come with a manual and begin fruiting in just 7 days -phenomenal!

A lot of other minute but relevant procedures and processes are involved in mushroom farming. These require some level of training and guidance for the first-time mushroom farmer. Kantry Farm Systems is an agricultural biotech company that provides products and services related to mushroom farming, fish farming, market intelligence services, digital farming education, and consultancy services.



Kantry Farm Systems based in Harare, Zimbabwe, can be contacted on all social media platforms under the name Kantry Farm Systems. To get in touch contact; Ngobani Ncube on +263777489017 or visit their website on www.kfs.co.zw.





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**Wheat
Peregrine**



Wheat - Peregrine

1. Variety - Peregrine
2. Maturity- very early 113days.
3. Very good standability, about 90cm height.
4. Very good disease package
5. High yielding - 7-9t/ha.
6. Protein content -11.2%. Adaptability - both high and low potential areas

Onion - Capricio

	For both fresh and dry market	
TYPE	Open pollinated	
MATURITY TYPE	Early short day	
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	



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Managing Brooder Environment

By James Kabinda, BSc. Animal
Production and Technology

The time spent in the brooder environment (first 14 days of the broiler's life) is a critical period in broiler production. Research has shown that there is a positive relation between early bird growth rate during the brooding stages and the final weights at slaughter. As such farmers would need to maintain and adhere to conditions needed within the brooder house in order to maximise on flock performance. Critical features of the brooder environment are; light, feed, water air quality, stocking density, biosecurity, and heat. The highest mortality in a poultry house is experienced during the first 10 days of life and is due to:

- "Starve outs" – birds that do not eat or drink (fail to find feed and water).
- Gout-uric acid (nitrogenous waste products) build up in blood stream due to dehydration.
- Navel ill or "omphalitis" – a bacterial infection of the umbilicus or yolk sac remnant of the chick.

This is why the management during this period is so essential to give your flock a good start. This article will articulate on the key brooder house management principles.



LIGHT

Light is one important management tool in broiler production, it will ensure that the chicks see feed and water points quickly. A single infra-red lamp is enough for 50 chicks. One parameter of light that needs attention is light distribution. Uneven light distribution may lead to poor bird uniformity. As such light needs to be distributed evenly within the brooder house. Additionally, poor lighting will hinder growth rate, thus the need to allow a good lighting intensity (around 30-40 lux is recommended from day old to day 7 of age and around 5 lux onwards).

The Lighting Program - Many broiler producers introduce what are called lighting programs. A lighting program is a documented system of controlling the time or period to which the birds are allowed light. Lighting programs differ from farmer to farmer and as well as from one stock feed manufacturer to the other. Many broiler farmers use a lighting program that provides what is essentially continuous lighting. This system consists of a long continuous light period followed by a short dark period of between 30-60 minutes, such that the birds get accustomed to the dark should power cuts occur. Information from trials has suggested that:

- After 7 days of age around 5 hours of darkness may be optimum (4-6 hours).
- Mortality due to sudden death syndrome (SDS or flips) and mortality and morbidity from ascites is reduced.
- The biological welfare of the birds is improved as normal behaviour such as rest is facilitated.

However, introducing a lighting program will greatly depend on flock performance. If farmer sees that the birds are under-performing, it will be wise not to introduce a lighting program, just to allow more feeding and improved growth performance.

FEED

Feed should be provided for; clean and dry. If the feed becomes moist, there is high risk of aflatoxin infection which leads to changes in performance that can be detected by low growth rate, poor feed conversion, and low flock uniformity. Feed should be available always in the feeders to reduce losses due to unnecessary feed restriction or negligence.

Proper feeder to bird ratio should be maintained at 1:50 birds for chick trays and 1:100 for tube feeders. Opening up more space for correct bird/space ratio of not more than 12 targets will reduce overcrowding the birds, which renders poor growth. From day old to 14 days of age, at least 6cm of feeder space per chick is needed. Whilst from day 15 to slaughter age they will need at least 10cm of feeder space per chick.

For the first 7 days, supplementary feeders (paper trays or lids) should be provided. The paper trays should cover around 80% of the house. Supplementary feeding will ensure that all the chicks are consuming feed and in addition improving growth performance and uniformity, given other brooding parameters are up to par.



Similar with drinkers, feeders need to be adjusted to correct heights to reduce feed wastage from spillage.



WATER MANAGEMENT

Water is a vital ingredient of life. Water supplied to broilers should contain minimum amounts of minerals, as high levels would encourage increased excretion which would impose a need to increase ventilation management. Similarly, to feed, clean and fresh water should be provided for at all times and vitamin/mineral stress pack is included for the first week. Inadequate water supply, either in volume or available drinker space will reduce growth rate. Water should be as cool as possible and drinkers must be easily accessible for the birds. Very cold or very warm water will cause reduced water intake. From day old to day 7, farmers can use 4l water font at a rate of 1:50 chicks, which are replaced with 16l bell drinkers (1:100 birds) onwards or one nipple for 10-12 birds at 5 weeks. Drinkers or nipple lines should be placed at correct heights at which the birds are able to reach. These height adjustments are done as the birds grow and they should be made in such a way that the back of the bird levels with the base of the drinker from day 18 onwards. This helps in minimising water spillage, which would cause increased litter moisture. It should be noted that, water requirement will increase in a hot day and vice versa on a cold day and also increases as the birds age.

Water requirement increases by approximately 6.5% per degree Celsius increase in temperature.

A basic water consumption guideline for broiler chickens from day old to 6 weeks of age. Water consumption per 100 chicks per day

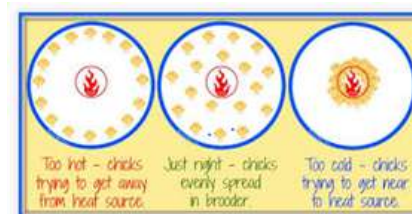
Age (weeks)	Litres
1	3
2	9
3	14.4
4	16.7
5	17.4
6	21.6

At 6- and 24-hour intervals following chick placement it is advisable to check the crop, to assess whether the birds have taken up enough water and feed.

- An empty crop would indicate that the birds have not found water and feed,
- A soft crop is indicative that the birds have enough water and feed, and
- A hard crop means the birds are feeding but not drinking enough water.

HEAT

Chicks cannot regulate their own body temperature until they are around 12–14 days of age. Ideal body temperature must be attained by providing optimal environmental temperature. Preheating the house is vital as floor temperature at chick placement is important. Pre-heating the poultry house to about 33°C is advisable for chick placement. A single infra-red lamp is enough to heat up 50 chicks, whilst one drum heater will cater for 500 chicks. The normal body temperature of a broiler chicken is approximately 41°C. When the environmental temperature exceeds 35°C, the broiler is likely to experience heat stress. The longer the broiler is exposed to high temperatures, the greater the stress and its effects. Some effects of heat stress are experienced in the later stages of the broiler chicken, usually from 3 weeks going forward. For example, ascites, one major cause of mortality at the later stage of the broiler induced by heat stress. Poor heat distribution can also have a negative result on bird uniformity. Priority ought to be taken to ensure even heat distribution within the brooder house. Bird behaviour is one indicator of heat distribution within the house.



The following table shows temperature requirements at different ages for broilers.

Age	Temperature (°C)
Day old	33
Day 7	30
Day 14	28
Day 21	26
Day 28	24
Day 35	22

AIR QUALITY

Ventilation is key to controlling the brooder environment. It necessitates maintenance of acceptable air quality within the poultry house whilst keeping the birds within their comfort temperatures. While pre-heating prior to chick placement, it is advisable to allow minimum amounts of ventilation.



The amount of ventilation will greatly depend on the heating being used. This will help in distributing heat evenly within the house, allow the bedding to remain dry and also eliminate harmful gases. Curtains should always be opened from the top to bottom for ventilation, this will allow air to circulate properly within the house and limits the occurrence of draughts.

As the birds grow and start to produce more heat, hence higher ventilation rates are needed to remove heat and the products of respiration (moisture) from the house. One will realise that continued exposure to air contaminants results in respiratory diseases and poor bird performance, lest some degree of ventilation is allowed.

With diets containing high levels of protein and/or salt, there is noticeable increase in excretion of waste gases and water (urine). Hence ventilation management vs. heat management conflicts, result in poor brooding and mortality.

STOCK DENSITY

Stocking density refers to the space provided for, to a group of animals in this case broiler chickens. Stocking density has great influence on bird performance, uniformity and overall product quality. As such producers ought to maintain stocking densities within specified guidelines. The stocking density used from day 21 onwards is 10 birds per square metre, meaning 1000 birds would require 100 square metres of space in order to maximise on flock performance.

On the other hand, overstocking would increase environment pressure on the birds, leading to poor growth and conversely reduced profitability of the farm. Overstocking has also been linked to cause mortalities due to ascites, hence maintaining proper stocking densities would help minimise the occurrence of this syndrome. Additionally, overstocking tends to encourage rapid transmission of disease within a flock and outbreaks can be economically devastating.

BIOSECURITY

These are a set of measures put in place within animal production facilities to limit disease entry from the external environment. Diseases entry within a flock can occur in many ways which include, humans, new batches, contaminated equipment and vectors such as flies or wild animals. By putting in place biosecurity measures farmers can actually “limit” the possible introduction of disease within a flock. Some of biosecurity measures that can be put into place within broiler enterprises include,

- Always start assessment from the younger birds, then older birds last.
- Controlling rodents and flies in the poultry house.

- Providing disinfecting foot baths and vehicles at points of entry to the poultry house and a hand wash area.
- Keeping other livestock at least 40m away from flock housing.
- Allowing a two-week rest of poultry house before introducing another flock and disinfecting the poultry house during rests using a high-pressure wash.
- Always providing clean safety clothing for workers and visitors.
- A perimeter fence should be present around the premises.
- Restricting entry into premises.



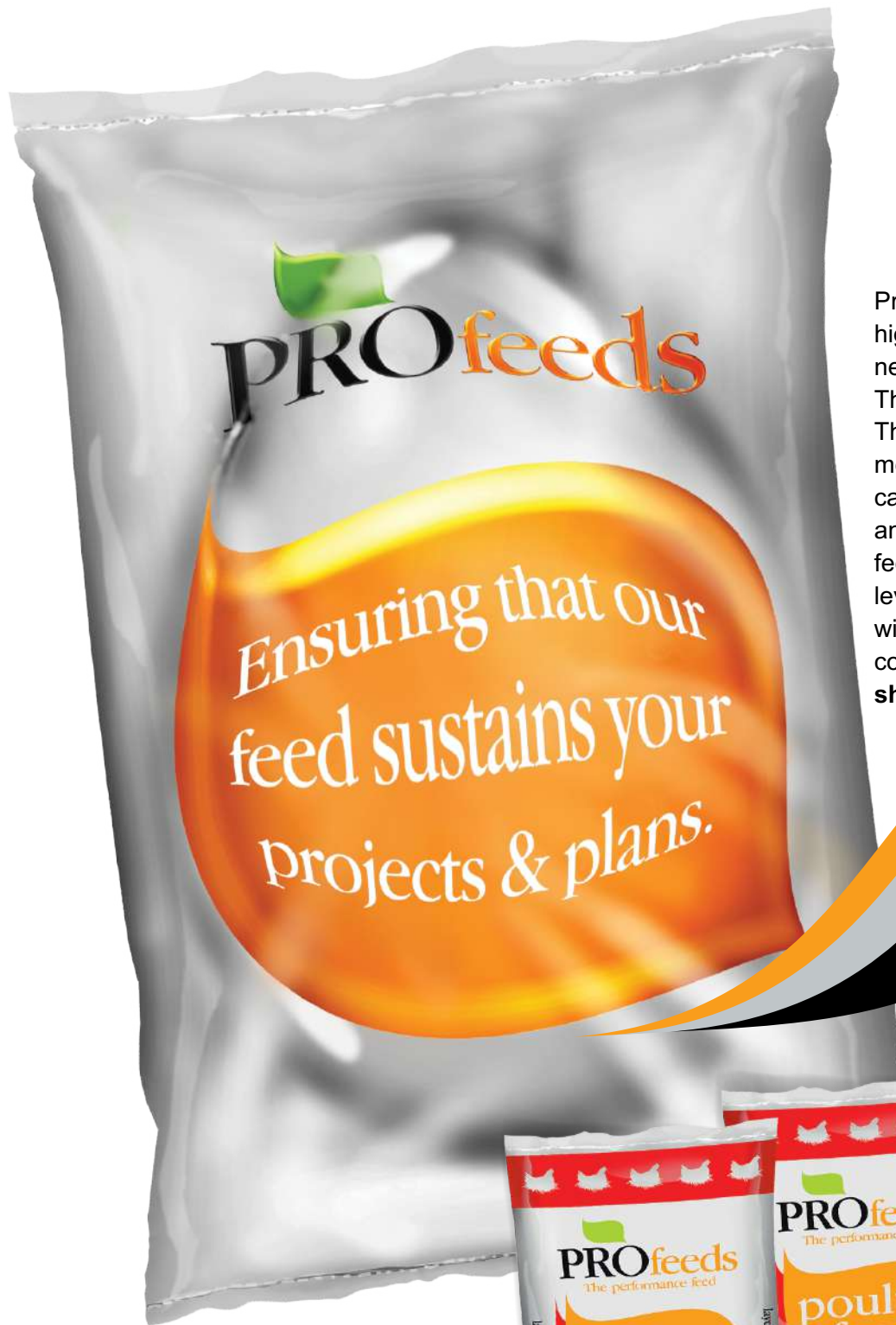
Good management practices within the brooder environment will ensure that broiler producers maximise on flock performance and inevitably capitalise on profits at finishing. Training and awareness are necessary tools that ensure the basic guidelines are put into practice.

For more information on poultry production contact KB Livestock Solutions on **+263 774 225 873**, or email **James at jameskabinda@gmail.com**

*Backlink – For more information on Ascites and Caring for Chickens Over Winter, refer to **ZiMunda Farming Newsletter Issue 3**.*

Images provided by James Kabinda and Vimbai Ruwengo

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Early Chick Mortality in Poultry

By General Beven Mundida,
Livestock Consultant

QUESTION- Despite feeding my chicks with a starter feed and give them stress pack in drinking water, I am experiencing a chick mortality of almost two to three chicks daily. Most of them have a pasty butt and high temperature. What could be the cause?

ANSWER - According to the poultry industry standards, a poultry farmer should aim at achieving a mortality of not more than 0.7 per cent cumulatively over the first seven days of brooding. This, therefore, means in a flock of 1,000, one should not lose more than one chick per day, a loss of 3 per day for a flock of 1,000 accounts for more inquiry, including post mortems. Discussed below are some of the causes for chick mortality;

1. Early chick mortality due to neonatal infections

There are three factors that can influence chick quality, especially during developmental stages in the mother's ovary up to the point of hatch. These are;

- mother hen health status,
- incubator conditions, and
- the hatcher operations.

If the chicks hatch from sick mother hens or parent breeding stock or from dirty eggs, have a high chance of experiencing poor performance and mortality in the first week if there is no immediate intervention. Likewise, a dirty incubator or hatcher can impact negatively on the chicks prior to placement.

How can one know if this problem came from the chick supplier? In most cases you will not be the only complainant. A discussion with your supplier will be crucial and a vet visit is certainly important to find out the causative agent and treat the flock appropriately.

2. Pre-placement un-preparedness

"Fail to prepare and be prepared to fail", this is a common saying in the poultry industry. Before receiving the chicks from the supplier, one should ensure that the house and equipment are thoroughly cleaned and disinfected, have adequate feeders and drinkers.

Flush waterlines with hydrogen peroxide to remove all the biofilms, and thoroughly rinse with water prior to chick placement. It is equally important to provide clean and good quality litter (wood shavings not saw dust) and spread at a depth of 7-10cm deep. Provide a heat source in the brooding area 24 hours before chick arrival.

3. Poor brooding conditions

Chicks cannot produce heat to keep themselves warm, they are largely dependent on artificial heat provided at temperature conditions. In the first week, provide litter temperature of 30°C, air temperature in the house of 33°C - 35°C, which will translate to optimal body temperature of 41°C. At this optimal body temperature, the chick will comfortably breathe through the nostrils and lose just about 1 – 2g of moisture in 24 hours. If the

body temperature goes beyond 41°C, the chick starts to pant and will lose 5 – 10g of moisture in 24 hours. Chicks will show pasted vents and eventually die if corrective measures are not immediately taken. Provide portable water and good quality feed at all times.



4. Biosecurity

Ensure that the flock is fully isolated and quarantined against disease-causing pathogens by ensuring that the units are inaccessible to rodents, wild birds, and unnecessary visitors. The workers must have proper personal protective equipment like overalls, wellington boots, masks etc. In large operations, showering facilities should be provided and farm workers are prohibited from visiting other poultry sites or slaughterhouses. It is important that the chicks are vaccinated according to the disease pressure of the local region and in consultation with your vet.

For more information on Chick management, contact General Beven Mundida on 263 776 420 161 or Email: gbmundida@gmail.com

Backlink – For more information on winter care of chickens, refer to [ZiMunda Farming Newsletter Issue 3 and issue 15](#) on an article on spotting diseases in chickens.