

# ZiMUNDA

## FARMING



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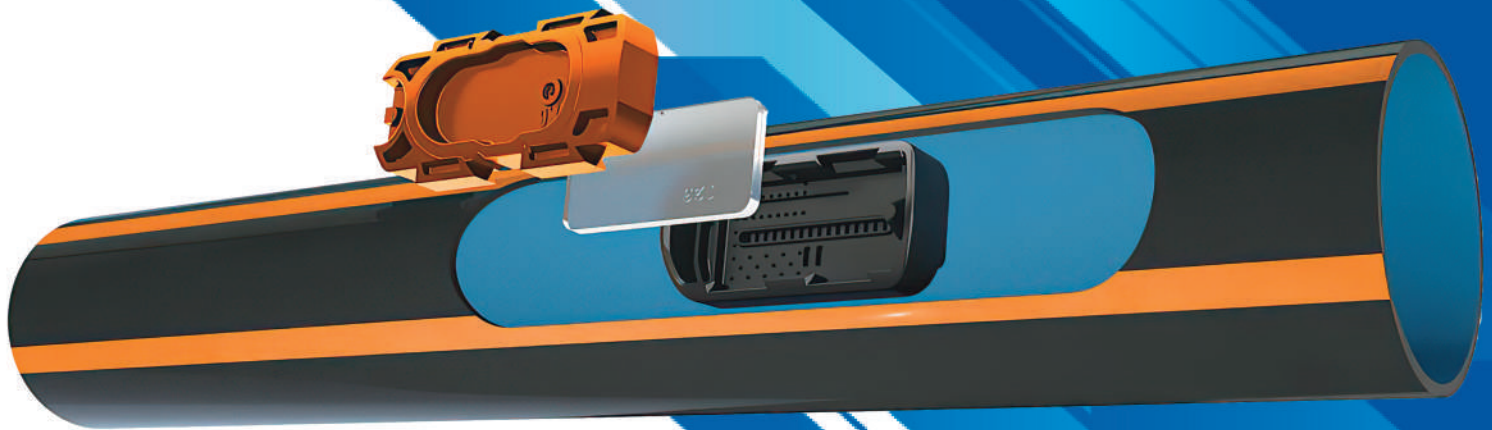
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# From the Editor

How time flies, the winter cropping season is coming to an end and winter wheat farmers are getting ready for harvest whilst rainfed crop farmers are now aggressively working the land to be ready by the start of the upcoming 2022/2023 season. As all this is a happening, there is still a buzz and reminiscence of the ADMA Show that has since come and gone in July of all the machinery – tractors and equipment that was on display. The three-day event attracted thousands of visitors from the agricultural community and its related sectors, as well as almost 200 exhibitors. The show took place at a site stretching over seven hectares in the centre of Harare’s Borrowdale Race Course. As in the past years, the turnout; exhibitors display; excitement; and advertising displays were unmatched. All around the exhibition grounds, one could spot mega tractors and equipment. The grounds were dotted with smaller equally attractive stands of smaller companies who had well mannered product display and cheerful team members ready to welcome any passer-by interested in their products.

And oh boy, did we not have the same fun experience as the ZiMunda

team! We re-launched our print magazine at the Show, this gave us, farmers and clients an added excitement for the event. As the show created an extensive networking platform, our team spread-out to enjoy chats with everyone who was happy to stop and receive a free magazine.

Because the response to this year’s show was exceptional (the first one after two-year cancellations due to the dreaded pandemic), it is my hope that the static displays and live demonstrations of tractors and equipment, gave farmers an opportunity to compare tractor brands, agricultural machinery and anything else a farmer would require for the upcoming 2022/2023 season.

I am confident that the value of the one-on-one interaction with company’s technical representatives brought the industry a good start to the cropping season ahead as we all work towards bountiful yields, and as the ZiMunda magazine, we cannot wait to share the farmers experiences with you!

**Yours in Farming**

## Vimbai



**The ZiMunda Farming and Softrite team at the ADMA Show.**

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#### DISCLAIMER

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.

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# Coping With Feed Shortages During the Dry Season

By EASI Seeds

Over the recent years most livestock farmers in Zimbabwe have faced pasture challenges and are increasingly growing concerned about the dry weather as well as lack of grass due to climate change.

Several farmers across the Zimbabwe attest that grass availability is declining and its growth rate has rapidly decreased forcing them to source alternatives for supplementary feed. During a discussion with EASI seeds representatives, Mr. Chingozha, a small-scale dairy farmer in Manicaland noted that climate change was affecting grass productivity on his operation leading to milk yields to drop from a daily average of fifteen litres to five litres per cow. “We are up in Nyazura, and we have been feeding cattle maize stover since June. We are on dry land (sand and gravel) and there is no grass in sight.” In addition, a commercial hay producer, Mr. Emmanuel Tavaruva of Masvingo noted that “yield from hay production off the veld is declining and therefore this year we will commence infield production of high yielding improved pasture varieties such as katambora, brachiaria and lucerne”.

In order to address this challenge during the dry season from June to end mid-November, farmers can;

**1. Introduce grass for hay and silage to compliment stock feeds (see ZiMunda issue 28 - Making and Maintaining Silage by Red Dane Farming).** Maize silage can be expensive for smallholder farmers as it competes with sustenance requirements but growing grass for hay and silage give farmers an opportunity to produce feed on idle or non productive grazing land. Varieties that farmers should consider include Rhodes grass Katambora, Smutsfinger, Forage Sorghums and annual legumes such as Velvet bean and lab lab that will add on the crude protein.

**2. Source supplementary feed** - This method allows the farmer to compliment the available grass or silage resource to meet the cow’s nutritional requirements throughout the year while keeping the cattle diet balanced. It is important to start supplementary feeding sooner rather than later, so that the animals maintain good body condition scores.

**3. Manage their grasslands** – A prominent livestock farmer emphasised that an animal having problems gaining live weight must be finished off and slaughtered once it reaches slaughterer age, to ease pressure on the grazing land (stocking densities). Dry female animals can be moved to fields with less grass as well.

During the dry season, calves must be weaned at a younger age (below 6 months in cattle), so that they can recover from weaning stress before the next winter. The young animal’s nutrition can be supported by creep feeding. Creep feeding



## Evidence of poor grazing land

is the practice of feeding young livestock that are still nursing a supplement in a sectioned off part of their environment. Creep feeding is a remedy for when cows are poor milking or when both pasture quality and quantity cannot support optimal gains. The composition of creep feed can vary, but is usually comprised of homny chop, hay, lucerne, soya cake, molasses and mineral supplements (see ZiMunda Issue 2, Creep Feeding by Chris Grant)

**4. Speed up grazing rotations** - Farmers should avoid overgrazing their pastures. As a rule of thumb whenever animals graze, 15-20cm of forage material should be left above ground to maintain persistence in perennial pastures. Do not let grass flower because then it stops growing, one pasture producer advised that *“Keep grass vegetative to grab moisture and allow good growth. Newly established pastures and pastures that have been reseeded tend to be more resilient. Therefore, they can sustain better grazing pressures”*.

*When pastures are planted in mixes e.g., katambora, velvet bean, silverleaf desmodium and lucerne, the yields outperform pastures established as mono crops. Though the mixed pasture crop may not look uniform the yields can double as compared to mono pastures as the different species occupy and utilise different portions within the field. When other species are affected by dry spells species such as lucerne remain productive as it has deeper rooting systems, bringing up that water from deep underground.”*

**5. Grow the right pasture species at the right time and the right way**-Always plant pasture species at the right time. Planting summer species during winter is not advisable as the ground temperatures will be too low to initiate germination. This leaves seed susceptible to pest damage and if the seed does germinate, it may burn off due to low moisture availability during that given period. As such, it is advisable to keep the summer pasture seed till summer season starts. Late sowing results in low yields. It is important to follow the weather forecast and prioritise good land preparation by rolling before and after seeding to capture the moisture that’s in the soil as well as improve the seed to soil contact.

# The Boran Field Day

By **Vimbai Ruvengo**



Staging breed promotion pens at field days in order to promote the qualities of the breed and advise any prospective Boran breeders is always welcomed by farmers as they come in numbers to learn. In June 2022, the Zimbabwe Boran Breeders Society (ZBBS) held a field day at ART Farm, Pomona. Boran pens were set up and manned by Society’s members specifically to promote the attributes of the breed. The Chairman of the ZBBS, Mr Mark Hook, thanked the



Permanent Secretary, Mr John Basera, for attending the Art Farm Quarantine Station opening and Boran Cattle Field Day. He also thanked international visitors Dr Percy Sharp, an embryo transfer specialist from New Zealand, as well as Mandy and Jackie Kenyon, well established Boran breeders from Kenya. The Kenyon family have been breeding Boran cattle for 60 years in Kenya.

The field day was packed with speeches and talks from different individuals who spoke on different topics such as;

### Breeding Locally Adapted Dairy Cows for Zimbabwe.

Percy Sharp, a seasoned dairy farmer started off his talk by asking the question *“Why we need to breed a locally adapted Dairy Cow?”*. To answer this question, he noted that *“the conventional high yielding dairy cow is not suited to be productive in hot, dry tropical environments unless they are intensively managed on irrigated pasture systems or in housed feedlot-type systems”*. Adverse conditions from heat

and humidity stress, internal and external parasites, tropical diseases and low-quality natural grazing, hinder these breeds from producing to their highest genetic potential.

To address this problem, Percy noted that there is need for the Development of the Concept of Tropical Adaptation. He went on to elaborate on his personal experiences in Zimbabwe at Magumbo’s Dairy and Road-Stall Masvingo Road in Beatrice producing Wakakora and the gave four examples of this development concept around the world, namely;

- South American Research (Mexico) were Jaime Elizondo developed a Milking Breed - Mashona x Criollo which produces an average of 5000 litres/cow.
- New Zealand Research incorporating the Senepol “SLICK – GENE” into NZ Friesian and Jersey. The SLICK hair locus derived from Senepol cattle confers thermotolerance to intensively managed lactating Holstein cows.
- Kenya Breeding Project (picture - right) - “Worera” 17 years old, has calved 14 times with 15 calves born, all from AI (she has never been served by a bull in her life!). She has produced over 75.000 litres of milk so far. Worera is a four-way cross with 50% Jersey, 25% Boran, 12,5% Sahiwal and 12,5% Guernsey blood.



- The New Zimbabwe Project – The cows in this project are crosses of New Zealand Genetics x Mashona. NZ world leader in dairy off pastures developed KiwiCross. In 2019, 150 embryos of KiwiCross, Jersey and NZ Friesian/Holstein were imported from NZ.

NB: The Mashona breed also shown to have a “Slick-Gene”.

### Attributes of the Boran.

Amongst the Zimbabwean Boran Breeders, Amon Jack (AJ) of the Bhengu Boran stud had an opportunity to speak on the attributes of the Boran breed based on his experiences and knowledge as a farmer in the Hwedza area. According to AJ some of the most significant attributes of the Boran breed are;

- Fertility  
Boran Bulls reach early sexual fertility at about 24 to 36 months but are late physically maturing at about 60 months (the more mature he becomes the more females he can run





CATTLE

with and becomes protective of his breeding herd).

Female Borans – they are early maturing at 14/24 months, provide adequate milk for calf and if in good condition she can take on bull with a calf on foot.

- Temperament and Herd Instinct - The herd instinct of the Boran makes it easy to manage and survive in bush country as they will always stay together.
- The X-Factor - Excellent as cross breeders, improves small framed cattle to medium frame, and crosses very well with local indigenous breeds.
- Body score condition – **“Do not be in the business of keeping cattle, but be in a business of growing grass”** said AJ. He went on to add that with supplements of either winter or summer licks, the Boran cattle are able to keep very good body score condition even if only kept in the veld.

In his closing remarks, AJ encouraged fellow farmers to embrace the act of Fellowship (visiting and meeting each other to share experiences of farming with the Boran).

### The Boran Breed in Kenya

For an ‘origins’ perspective and a wider view, Jackie Kenyon of Mogwooni Boran Stud, in Kenya gave a brief history of the Boran – how the Boran developed into the dominant breed of eastern Africa. He noted that today’s cattlemen prefer the Boran because of its relative adaptability to the local environment, achieved through generations of natural and artificial selection. Because the breed can be kept primarily for beef production in semi-arid zones, Jackie highlighted that at his farm made of half red clay soils and the other clay; the herd still keeps good condition.

In light of the history of Mogwooni, Jackie expanded on the importance of record keeping which was done since the conception of the farm in 1963. Its owners (the Kenyons) have always recorded, kept, as well as submitted performance records to the Livestock Recording Centre (LRC). Amongst other mandates, the LRC provide support for beef recording through maintaining data on growth performance of the Boran cattle. **“With records at hand, one can give ratings on weaner performance,”** said Jackie.

Jackie ended his talk by calling out that **‘embryos are the way to go for the future of Borans’**.



### The Future of the Boran Breed

The field day was coupled by the official opening of the Quarantine Station run by Dr Doug Bruce. The efforts contributed by breeders into improving the national herd was applauded by the Permanent Secretary at Ministry of Lands, Agriculture, Fisheries, Water and Rural Resettlement, Dr John Basera. He noted that to improve production issues the government of Zimbabwe is working towards the future of livestock genetics by promoting programs in Artificial Insemination and Embryo Transfer.

**The construction and official registration of this Quarantine Station marks a significant advance for the pedigree cattle industry in that it opens the safe import and export of genetic material in the form of live cattle, frozen bull semen or fertilised embryos to various parts of Africa and the rest of the world.**

Field days are always a place to learn, fellowship and grow as a farmer. For more information on the Boran Field days, becoming a member of the ZBBS and to register your Borans, please email [boranzimbabwe@gmail.com](mailto:boranzimbabwe@gmail.com)





# Key Vaccinations in Cattle

By Dr O Choga, Coopers Animal Health Zimbabwe

In the Zimbabwean livestock industry, a number of diseases are reported and causing grave losses. These diseases are preventable by vaccination; without vaccination, they either become untreatable or very costly to treat.

**Vaccination** is based on the principle that animals can build antibodies or cellular immunity against diseases causing agents e.g., bacteria and viruses. Vaccines can either be dead or weakened forms of the disease-causing agent that is able to provoke an immune response without causing the fatal form of the disease but promotes the development of antibodies or cellular immunity. This process takes 14-21 days. In most cases, there is a need for booster vaccinations so that sufficient immunity is attained which usually takes 48-72 hours. A secondary immune response is more rapid because the body of the animal recognises the vaccine.

Livestock diseases currently being vaccinated against across the country include **lumpy skin disease** using Lumpyvax® and blackleg, botulism and anthrax using Prondistar® vaccine (3 in 1) in all livestock classes, and these are mainly done in winter or before the rains start. Other important vaccinations that should also be considered for breeding stock are those against reproductive diseases such as **brucellosis** which is a major cause of abortion in heifers or cows in their third

trimester e.g., Brucella RB51® vaccine (in heifers and cows not previously vaccinated) and the one against **vibriosis** mainly in bulls but can also be used in breeding animals in high-risk herds e.g., Vibrin®. Most of these vaccinations are carried out annually except for Brucella RB51® vaccinated once.

In addition, based on the recommendation by the consulting veterinarian diseases such as **Bovine Ephemeral Fever** (3-day stiff-sickness) may require vaccination using B-Phemeral® vaccine, **Rabies** using vaccines such as Nobivac rabies, **Rift Valley Fever** vaccine, **diarrhoea** in calves using Rotavec Corona® vaccine in cows in their last trimester with no need for a booster to limit mortalities. **Bovine respiratory diseases** caused by should also be vaccinated using Respiravax® which also protects against bovine viral diarrhoea.

It is crucial for farmers to discuss with their veterinarians to draw up a vaccination program based on the history of the farm. All farmers are recommended to vaccinate with Lumpyvax®, Prondistar®, Vibrin®, and Brucella RB51®. Control of Brucellosis is a statutory requirement, and it must be noted that it is **zoonotic** and hence can be spread to humans. All vaccines mentioned in this article are available at Coopers Animal Health.

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# Have You Got Your BULLS In a Row?

By John Crawford, Mukono Magic

Bulls provide the largest proportion of calf crop genetics, so it is important to select a herd sire that can produce your desired offspring. The bull's genetic value to an enterprise is based on how well its individual attributes fit the herd's breeding objectives.



## Selecting the RIGHT Bull

- Select which BULL BREEDER you are going to buy from
  - o This is the most important decision you will make – an honest Bull Breeder will give you the right advice and guide you according to your needs.
  - o You must trust the Bull Breeder, if you have your doubts – do not go there
  - o Spend time in their herd, asking questions, you will soon get to know if the Breeder is passionate about his cattle, or just wants to sell you a bull.
  - o Look at the relatives of the bull, particularly his Dam and Sisters.
  - o Do not be in a rush – buy wisely.
- Select THE RIGHT BREED for your environment and your target market.
- Select the best bull from the RIGHT BREED & RIGHT BREEDER, that also suits your budget.
- Be careful of the CHEAP (Poor quality) bull. He could be the most Expensive Investment in your herd – considering the impact he could have; he could easily sire 25 calves per year and be in your herd for at least 6 years – potentially siring 150 calves (75 daughters).
  - o You will be dealing with his daughters for (at least) the next 10 years, and then his granddaughters will still

have his “poor genes” for even longer  
 o A Good bull (at the right price) will have you reaping the rewards for many generations to come

- Temperament - Do not compromise on this trait. He will not improve when you get him home, he will be wild forever and teach your cows to be the same.
- Fertility - The most important trait to select for. Returns on investment will be severely jeopardised if your cows do not calve regularly (the perfect cow will calve at the same time every year, for a number of years).
  - o Using EBV's (Estimated Breeding Values) we have two selection tools
    - Days to Calving (DTC) this is the most accurate measure of predictable Fertility.
    - Scrotal Circumference (SC), this is more a measure of early maturity, which is often correlated to fertility.
  - o Without EBV's you can use the number and frequency of calving of the bulls' mother and sisters. The inter-calving period (ICP) should be as close to 365 days as possible, if she has missed a breeding season, she is costing you money
- Condition Score
  - o Fat bulls are “pretty”, but they are NOT practical.
  - o They will take time to lose weight, to where they are able to function properly.
  - o Best to buy bulls where you can see the faults, they are not hidden by fat.
- Bulls raised in a similar environment to yours, will adapt easily to the move.
- Younger bulls in lean condition are best, as they will adapt easier to your environment, be aware that younger bulls need to more closely monitored that they do not lose too much weight, especially in their first year of service.
- It is a good idea for the bulls to have at least 3 months on your farm, before they are required to start working.





## Maintaining Your Bull

- Adaptation period – after buying.
  - o Too often we see “Pretty” bulls come out of the Sale ring “for an expensive price” (having spent at least three months in a “5 Star Hotel”, arrive on the farm / ranch and get put straight onto the natural pastures, and lose weight rapidly and succumb to disease, as a result, of being weakened nutritionally. Their rumen needs time to adapt, especially if they have been on a grain-based diet
  - o Blocking and immunisation – apart from nutritional needs you must meet the health needs
    - Consult your veterinarian, for the necessary disease control measures.
    - Be aware of external parasites – Ticks – far too many cattle in Zimbabwe succumb to Tick borne disease – Keep your bulls clean of ticks.
    - Also take note of Internal parasites – Worms and Fluke – your veterinarian will advise on the frequency of treatment.
- Your bull is a Professional ATHLETE
  - o Treat him like one – keep him in “Olympic Games” fitness.
  - o No need for excesses.
    - Do not over-feed him – or under-feed him.
    - Keep him in a good body condition throughout the year.
    - Make sure he is in an adequately-sized paddock, for exercise and access to natural grazing – so that he can get used to his new home.
    - If you have multiple bulls together – give them plenty room to fight and sort out their hierarchy – Fighting is good for muscle development – make sure the Bull paddock does not have any holes

- o or obstacles that can cause injury.
- o If you have a Bulling Season – then give him a spike of nutrition a couple of months before he goes to “WORK”.
- o If you take care of his needs, he will take care of your needs.



- Remember, Your Cattle work for you - you do not work for them
  - o There is no point having another job to subsidise your cattle business.
  - o If your cattle are costing you money, then you are doing something wrong –
    - Wrong breed? - Wrong environment? - Wrong management?
    - If you have chosen an Honest Bull Breeder, they should be able to advise you on the appropriate measures to take, even if it means directing you to another seller (whom they trust).

**Remember your cows will not get pregnant without a bull.**



**Enjoy your cattle!!! I Do.**

# Annual Livestock Auctions at CC Sales

By ZiMunda Farming Magazine



Since its establishment in 1911, CC Sales has been providing marketing solutions to Zimbabwe’s Agriculture Sector through a number of channels that include, livestock auctions, property sales and evaluations, equipment and machinery sales, livestock import and export as well as artificial insemination.

Weekly livestock sales are mainly commercial livestock including slaughter cattle, breeding stock and short to medium term stocker cattle. Specialised sales are generally held mid-year and these include the National Zimbabwe Boran Breeders Society (ZBBS) annual sale and the National Breed annual sale organised by the Zimbabwe Herd Book (ZHB). The special auctions offer the stud breeders an opportunity to both showcase, sell high-quality livestock and source the very best livestock for their businesses.

As the establishment is recognised for its excellence in auctions, the lairage facilities for stock allows for pre-sale visits, where buyers can view, judge and inquire for the genetic history of the animals they wish to purchase prior to the auction day. The pre-shopping experience is further motivated by the auction catalogue, which indicates a brief summary of each animal on sale. This year was no exception, the two aforementioned breed sales attracted high quality entries from across the country and offered an excellent opportunity for farmers to buy well-bred animals for their herds.

## The 7th National ZBBS Sale

On the 25th of June 2022 nothing but top-quality Boran genetics was presented for auction at CC Sales, Mt Hampden. Prior to the national sale the ZBBS committee members visited the soon to be auctioned Boran animals for inspections and to ascertain that they conformed to the breed standards. Needless to say, the Borans presented at the auction where a true definition of the breed. With a lot of farmers now aware of the huge benefits brought about by the x-factor (hybrid vigour (see ZiMunda Issue 25), the bidding from both commercial and stud breeders was intense. The highest selling bull (lot 6) from the Langton Boran Stud was bid for USD 5,760. The bull is an exceptional,

tough, masculine Boran bull that boasts exclusive Zambian lines with a good sheath, excellent scrotum (scrotal circumference 40cm) with a well-maintained condition. The Society also put their sale online to cater for the non-present breeders. Of the 31 lots registered on Meerkat, 2 were sold online adding a total value of USD 5,600.

GRADE	DESCRIPTION	QTY	MAX_AMT	AVG_AMT	MIN_AMT
B	BULLS	12	5,750.00	3,120.83	1,200.00
CC	COW AND CALVES	9	3,100.00	2,427.78	1,500.00
H	HEIFERS	19	2,700.00	1,402.63	700.00
PG	IN CALF HEIFERS	20	3,300.00	1,602.50	1,000.00
PGC	IN CALF HEIFERS + CALVES	3	3,000.00	2,933.33	2,900.00

## The 54th National Breed Sale

On the 27th of July 2022, a remarkable 141 lots went under the hammer at CC Sales. With a total of 23 Stud Breeders registered for the auction, there was so much excitement for the genetics on offer. On the auction day, aggressive bids were witnessed, with participants on the online Auction platform Swiftvee also making their presence felt. The highest selling bull was at USD 13,500 (Lot 25) from D.C. Odendaal. Its selling price was a testimony of its superior genetics as it is the half-brother to the top selling bull last year from the same dam 12-0029OD. The Boran breed took lead in the heifer’s category, selling the highest priced heifer at USD3,250 – Lot 25 from the well-established Hook Borans.

GRADE	DESCRIPTION	QTY	MAX_AMT	AVG_AMT	MIN_AMT
BB	BRAHMAN BULL	32	13,500.00	5,776.56	2,300.00
BH	BRAHMAN HEIFER	36	2,700.00	1,797.22	800.00
BMB	BEEFMASTER BULL	4	8,500.00	5,937.50	4,500.00
BMH	BEEFMASTER HEIFER	9	1,400.00	1,400.00	1,400.00
BOMB	BONSMARA BULL	1	4,000.00	4,000.00	4,000.00
BORB	BORAN BULL	7	7,000.00	4,178.57	3,000.00
BORH	BORAN HEIFER	5	3,250.00	2,440.00	2,000.00
NB	NKONE BULL	3	3,000.00	2,500.00	2,000.00
SB	SIMBRA BULL	5	5,000.00	3,000.00	2,500.00
SH	SIMBRA HEIFER	5	1,000.00	800.00	750.00
SIMB	SIMMENTAL BULL	1	3,000.00	3,000.00	3,000.00
TB	TULI BULL	4	5,500.00	3,875.00	2,500.00
BG	BOER GOAT	1	650.00	650.00	650.00

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# Key Factors That Determine the Success of Artificial Insemination in Cattle

By Nathaniel and Eunah Makoni, ABSTCM (Pvt) Ltd.

In 1779 Lazzaro Spallanzani, an Italian, discovered that semen can be transferred manually to a recipient female animal that is on heat resulting in conception and pregnancy. Later, this led to the commercial use of artificial insemination (AI) technology in livestock. AI is the technique whereby semen with live sperms is collected from the male and artificially introduced into female reproductive tract at appropriate time using instruments. When carried out efficiently this results in birth of normal offspring.

The advantages of A.I. over natural mating include genetic improvement, production management and control of venereal diseases. The Zimbabwe cattle herd is estimated at 5.6 million of which less than 2% are dairy and 98% beef. Dairy cattle inseminations occur continuously throughout the year and for beef cattle insemination is largely during the normal breeding season, December to March. Considering the merits of AI and cognizant of the pitfalls, this article discusses efficiencies of AI in both beef and dairy cattle especially the causes of variations in success and conception rates.

There are four main factors that determine the success of AI. To improve the success of AI and before any cow is inseminated the following four factors should be examined;

## 1. Heat Detection Efficiency

Heat detection efficiency is a farmer responsibility that is critical for AI success. Farmers and cattle herders should be well trained in heat detection. There are many instances when farmers, but not cattle herders, are trained in heat detection and the knowledge acquired is not passed to cattle

herders. Heat detection training should be offered to those responsible for looking after cattle daily. Where cows are handled daily, for example, on dairy farms, there is opportunity to observe heat daily and inseminations can be done after natural heat detection. The AM/PM rule is that cows observed on standing heat in the morning should be inseminated in the afternoon and vice versa. Where natural heat is the basis for insemination, on-farm inseminators or AI service providers should be available to respond to farmers' calls for insemination. Timely availability of an inseminator is critical for success of AI. As a consequence of limited numbers of inseminators and uneconomically long distances of farms from inseminators, farmers may fail to get inseminators in time to breed cows on heat. Best practice is for farmers to observe heat throughout the day or for at least 30 minutes during individual periods in the morning, afternoon, evening and at night.

Heat detection is more challenging in Zebu and Sanga cows that express heat for periods even as short as 2 hours. Where an inseminator is available any cow observed in standing heat can be bred immediately. For Zebu and Sanga beef cows, insemination is often done 6 hours after standing heat is observed.

## 2. Inseminator Efficiency

Competence of an inseminator is as critical as the other three factors that influence AI success. Often, when AI fails, farmers blame inseminators for incompetence. This is not always true. Inseminators should be tested for competence or retrained on the skill of insemination and the associated



AI In Binga





### AI in Murombedzi



unsuitability of the cows for AI. Because the importance of adequate feeding in promoting cow fertility is unequivocal, AI should be implemented where and on animals that get adequate feed and attain the minimum bodyweight and body condition score for breeding.

### 4. Semen Quality/Bull Fertility

Semen quality determines AI success and is a critical control point for the same. There are many instances when low fertility or non-viable semen has been used for AI. We have observed poor semen handling by many farmers and inseminators. Both farmers and inseminators should follow best practice including proper semen handling, care and maintenance of liquid nitrogen tanks. Semen exposed

above the tank frost line for more than 10 seconds can lose viability if re-immersed in liquid nitrogen. This poor semen handling can be happening repeatedly when inseminators pick semen from the tanks severally thus, compromising fertility. Consistent with the strategy to ensure viable semen is used for AI farmers should be discouraged from using semen from un-vetted sources or semen not tested for viability. This should be a critical quality control point not to be compromised. Breeding records of the bull used should be available or presented by an inseminator or semen vendor. The farmer should retain the spent bull semen straw and record the details, insemination date and inseminated cow identity.

practices. In our experience, while most inseminators have the insemination skill, some of them mishandle semen, particularly during transfer from the holding semen tank. Also, most inseminators consider their responsibility to be the act of inseminating. The notion of AI should be inculcated as a process that requires team effort. To this end, the inseminator should lead the process through advising the farmer on ideal cow fertility and heat detection accuracy. Apart from inseminators possessing insemination skills, they should have some elementary pregnancy diagnosis skills to preclude inseminating pregnant cows.

### 3. Cow/Heifer Fertility

In order to ensure that appropriate heifers and cows are presented for AI, within breed, heifers and cows should attain the minimum bodyweight and body condition score suitable for breeding. In this regard, heifers should reach between 65% and 70% of the mature cow bodyweight and preferably should have been observed expressing regular heats (estruses) before being presented for breeding. While 60% to 65% of mature bodyweight is acceptable for dairy cattle, for Brahman, Mashona and Nkone a minimum of 70% of mature bodyweight is preferable. Attainment of the minimum breeding bodyweight is a major consideration when accepting heifers for AI and this requirement should not be compromised when selecting heifers to inseminate. Further, from our extensive experience farmers bring heifers with bodyweights below the prescribed breeding bodyweight and insist that they be inseminated. When faced with such demands, and for a good reason of preventing financial losses and blame when unsuitable heifers fail to conceive, inseminators should desist from inseminating such heifers.

Body Condition Scores of heifers and cows presented for breeding should be 3 to 4 (scale 1-5; 1 = lean and 5 = fat). Inseminators should exclude cows with bodyweights below the ideal bodyweight and BCS under and above the ideal range from insemination. AI service providers or on farm inseminators should inform the farmers about the

***In conclusion, four factors determine the rate at which pregnancies occur within a herd. AI programs should be anchored on these four factors. Anything less than the highest possible performance level for each of the four factors will substantially reduce reproduction efficiency.***

For more technical information and expert advice, email Nathaniel and Eunah Makoni on eunahm@abstcm.com or nathanielm@abstcm.com, or visit 4 Bannockburn Close, Mt Pleasant Harare / Website: <http://www.abstcm.com>.



Calves born out of AI



# The Art of Soil Sampling

By Wendy Madzura, SeedCo Agronomist

Soil sampling is the process of taking a small sample of soil from the field, which is then sent to a lab to determine the nutrient content. The soil can also be tested for the chemical, physical and biological properties, which are critical to plant nutrition. The analysis provides useful information on,

- Imbalances in pH levels.
- The nutrient status of the soil.
- The organic matter of the soil.

## Organising the Sampling Field

The procedure for soil sampling should be based on soil type. Fields are split into sampling blocks that contain similar soils e.g., block A, B, C and so on. Hillsides are kept separate from bottoms since the soil types will vary greatly. Soil survey maps, if applicable, can help organise the soil types throughout the sampling area. Samples will not necessarily need to be collected for every soil type; however, similar soils should be kept together. The zig zag, random, the cross-diagonal methods are commonly used and recommended where samples are taken in a zig-zag or at cross diagonal format from a block. This will result in a sample which scientifically represents the whole block.

## Soil Sampling Blocks

The sampling block will be dependent on the soils and topography. Generally, a block of 10-20 ha is considered the maximum size. Smaller sampling blocks may be needed if the soils are quite variable or a production problem is apparent and evident. Once the sampling block is determined, a sufficient number of sites/cores should be taken to acquire a representative sample. This is generally 10 to 20 sites. The depth of sample for surface soils would be about 20cm or as deep as the primary tillage or specifically as deep as the root zone of intended crop(s). This is also called the **tillage layer**. The most commonly used tools for taking samples are augers, probes, hoes or sometimes shovels. Samples from different sites in a block are then mixed thoroughly and bagged into a khaki pocket and labelled. Information on the labels should include the farmer's name, farm name, contact details, block name, date taken and intended crop before they are submitted for analysis to approved laboratories.

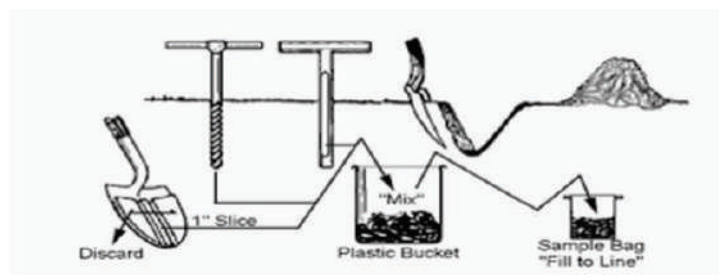
## Soil Testing Labs

Most fertiliser houses do sample free of charge or a paltry sum. Other approved laboratories include the Department of Specialist Services-Soil Chemistry laboratories. Other options include Soil Testing Laboratory at the University of Zimbabwe 's Soil Science Department; Tobacco Research Board, AgLabs etc. Always prescribe the intended tests before submission. We strongly recommend farmers to do a full analysis (pH and soil nutrient profiling).

## Actions after Test Results

Soil analysis results normally comes with recommendations. We recommend farmers to understand the recommendations from the laboratory tests and also to seek technical guidance in the interpretation of results from Agritex extension personnel in their respective holding areas. (For general guidance refer to the next article). Seed Co Agronomy Services also assist in interpreting results from laboratories. Contact a Seed Co Agronomist in your province.

**Soil sampling and analysis is highly informative. By using a consistent, well-conducted, and organised soil sampling approach one can monitor changes in soil fertility, develop a customised fertiliser program, and hence improve on-farm nutrient efficiency.**



A Guide to Soil Sampling

## The do's and don'ts of soil sampling

Do's	Don'ts
<ul style="list-style-type: none"> <li>✔ Sample soils more than 3 months before the next season for effective soil conditioning.</li> <li>✔ Sample to a depth of 15cm to 20cm (rooting zone depending on the crop).</li> <li>✔ Take 15 to 20 samples per hectare or guided by field variations.</li> <li>✔ Mix the sub-samples to get a representative sample of the field (take 1kg for analysis).</li> <li>✔ Label the soil samples for easy reference.</li> </ul>	<ul style="list-style-type: none"> <li>✘ Avoid sampling on areas with bias e.g., ant hills, different soil types, areas with ash, fertiliser mixing points etc.</li> <li>✘ Avoid sampling on the soil surface with debris and humus.</li> <li>✘ Avoid contaminating the sample by using empty fertiliser bags for collection etc.</li> </ul>

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# Soil Conditioning for Increased Crop Productivity

By Wendy Madzura, Head of AGRONOMY Seed Co Zimbabwe (Ltd)



Soil pH is an excellent chemical indicator of soil condition (quality and its ability to avail nutrients (both macro and micro)) to the crop on top of other soil structural quality properties. Soil can either be acidic or alkaline on the Calcium chloride scale however most soils in Zimbabwe are acidic with varying degrees of the acidity from slightly acidic which is preferred for crop production to very acidic which is toxic to crop production and affects the uptake of nutrients by the crop.

## What are Acid Soils?

Soil pH is the measure of the acidity or alkalinity of the soil with a range of 0 to 14. A soil with a pH of 7 is considered neutral while less than 6 is considered acid and a soil with pH greater than 7 is considered alkaline. Acid soils contain high levels of active hydrogen and or aluminum in relation to calcium and magnesium levels. Farmers can improve the soil quality of acid soils by liming to adjust pH to the levels needed by the crop to be grown.

## Basic Causes of Soil Acidity

- Soils may become more acid as a result harvested crops removing bases such calcium and magnesium from the soil. This is a normal and natural process. Different crops remove different amounts of Calcium and Magnesium from the soil.
- Rainfall, the water passing through the soil leaches basic nutrients such as Calcium and Magnesium beyond the root zone into drainage water replacing them with acidic elements such as Hydrogen, Manganese and Aluminum and thereby acidifying the soil.
- Application of nitrogen fertilisers e.g., Ammonium Nitrate or Urea and to a lesser extend though basal fertilisers, contribute to soil acidity by nitrification of ammonium to

nitrate a process which releases hydrogen ions. Organic matter breaks down naturally in soil and hydrogen ions are released, which causes an increase in soil acidity. Plants release hydrogen ions to the soil which contributes to the soil acidity.

## Why Soil Acidity Matters to Crop Productivity

- 1. Toxicity to the crop:** as the pH decreases below 5.5, the availability of aluminum and manganese increase and may reach a point of toxicity to the plant. Excess Aluminum ions in the soil solution interferes with root growth and function, as well as restricting plant uptake of certain nutrients.
- 2. Effect on phosphorus availability:** acid soils cause Phosphorus to form insoluble compounds with aluminum and iron. Liming of soils with low pH dissolves these insoluble compounds and allows Phosphorus to be more available for plant uptake.
- 3. Micro-nutrient availability:** acidic soils affect the availability of micro-nutrients in the soil and affects general crop development and productivity ultimately.
- 4. Soil organisms:** some micro-organisms e.g., important bacteria and fungi in the soil associated with nitrification require a certain soil pH level to function efficiently. In other words, the beneficial microorganisms do not function efficiently in acidic soils (low pH).
- 5. Soil physical condition:** liming improve soil physical structure by reducing soil crusting/capping and this promotes better emergence of small-seeded crops and ultimately result in better crop stands. Remember population stand is key in attaining higher yields generally in all crops.

A good liming program is based on soil test after soil sampling, which then determines the degree of soil acidity and the correct amount of a liming material needed to neutralise that acidity. Once this amount is determined, a liming material must be selected that will economically satisfy the soil test recommendation and result in maximum and efficient crop productivity levels.





### The Right Time to Lime

Lime should be applied at least 3 to 6 months before crop establishment since it takes a significant amount of time for lime to dissolve and react with the soil to cause the desired adjustments in pH. In other words, a week after harvesting is the best time to apply lime. However, farmers should note that, application of lime can still be done even during crop establishment and the lime can act as a

‘buffer’ which acts as a conduit for nutrient uptake from soil to crop through the roots and adjust the pH during the later stages of the crop cycle. Frequency of subsequent liming should be determined by soil tests.

### Lime Placement and Incorporation

The most important factor determining the effectiveness of lime is placement and incorporation. Placement for maximum contact with the soil into the root zone of the intended crop/ tillage layer is essential and must be achieved. We generally recommend lime to be applied in the 15-25cm zone as this is a root zone range of most food crops grown in Zimbabwe e.g., the staple crop-maize. For maximum effectiveness, lime should be uniformly spread and incorporated into and with the soil. Incorporation can be achieved through discing or harrowing followed concurrently by a roller. In Zimbabwe liming agents are in powdery formulations to increase surface area for quicker reaction with the soils.

Lime can be spread by hand or by lime spreaders-which normally gives the best results. Hand application is normally not recommended when the weather is windy. However, I have seen some smallholder farmers mixing lime with a basal fertiliser before application and giving commendable results. However, my only concern with this method is on the timing of lime applications (basal fertilisers are normally applied during planting and yet we recommend lime to be applied 3-6 months before crop establishment). But still act as a buffer.

### How Much Lime to Apply

We recommend farmers to follow recommendations on the soil analysis results with regards to amounts and type of lime to be applied. The amount applied is depended on the acidity levels of the soil and differs from one soil type to another. However, the following general recommendation can be useful and is depended on the soil type.

### Liming Agents Available in Zimbabwe

It is important to sample your soils for analysis to determine

pH and also the liming agent to be used. We strongly discourage farmers to blindly apply lime without qualification of the liming agent from soil analysis results. This can result in some detrimental effects to the soil and crop productivity. It can result in what we call preferential uptake. In Zimbabwe we basically have two types of liming agents i.e., Dolomitic Lime (Magnesium Carbonate) which is ideal for adjusting pH in magnesium deficient soils. The other agent available in Zimbabwe is Calcitic Lime (Calcium Carbonate) which is suited for adjusting pH in calcium deficient soils. There is no blanket recommendation for a liming agent and hence this should be noted. Preferential uptake is when a certain nutrient is taken up at the expense of the other or a balanced uptake due to concentration differences. A good example is when Calcitic lime is applied (blindly) instead of Dolomitic lime- this will cause an increased uptake of Calcium at the expense of a balanced uptake with other elements e.g. Magnesium, and therefore a crop will show magnesium deficiencies-yield will be affected.

### Is Lime the Same as Gypsum?

This is a frequently asked comparison. Lime (Calcium Carbonate/ Magnesium Carbonate) adjust soil pH and at the same time supply the soil with either Calcium or Magnesium and Carbon, depending on the liming agent used. Lime ‘sweetens’ acidic soils. On the other hand, Gypsum (Calcium Sulphate) is a supplementary source of Calcium and Sulphur which farmers apply whenever there is deficiency of these 2 elements in the soil. It should be noted that Gypsum does not adjust soil pH but rather supplement the soil with Calcium and Sulphur. Gypsum also improves soil’s physical structure i.e., removes hard setting, lumpiness, surface crusting/capping and improves soil workability.

**Effective soil sampling and soil conditioning is one of the cornerstones for effective crop production, however farmers should couple soil conditioning with effective nutrient management as stated by Liebig’s law of the minimum “growth is dictated not by total resources available, but by the scarcest resource”.**

### Season 2023 here we come...

Source, Seed Co Agronomy manual [www.seedcogroup.com](http://www.seedcogroup.com)



# Reducing the Risks Associated with Pesticide Exposure from Empty Pesticide Containers

By R. Mavuka, Crop Production and Molecular Technologies Division TRB

The Tobacco Research Board (TRB) encourages and promotes Good Agricultural Practices (GAP's) in tobacco production. The proper handling and disposal of empty pesticide containers is one of the essential components of GAP's, and if not managed correctly, these can be hazardous to both humankind and the environment. As the tobacco crop season starts, it is inevitable that empty pesticide containers will be found on farms. There is a **danger of inappropriate use of empty containers for storing food and water**, which could result in pesticide poisoning.

## Improper disposal of empty plastic pesticide containers



## Handling and Disposal

The handling and disposal of empty pesticide containers is an important aspect of the life cycle management of pesticides, which is often neglected - users tend to concentrate efforts at avoiding operator exposure. In contrast to direct exposure, when mixing or spraying pesticides, the risks from poor container management are usually less direct and often involve family members. Farmers must be aware that dangerous levels of pesticide residues may remain, even after their attempts to carefully clean containers using sand, soap or kerosene. Insecticide containers in some instances are used for hauling water from communal wells, thereby contaminating water supplies for an entire village. Incorrect storage of pesticide products left over from the season (in kitchens or bedrooms, in food stores and granaries) also pose high risk, especially where children and livestock have easy access.



Inappropriate disposal of empty pesticide containers can also be high risk. Containers abandoned in the environment can lead to pesticide pollution of soil, rivers, dams and groundwater. Apart from direct pollution by discarding containers in or near water courses, burning or burying containers in the open field or shallow pits contaminates the water courses and food crops growing nearby. The containers buried in shallow pits are easily uncovered by animals or exposed by wind or rain. Furthermore, plastic

containers are not biodegradable and the vacant space inside them and their low density may cause them to rise gradually to the surface, resulting in environmental pollution. Burying even rinsed pesticide containers at the place of use is not a good solution as it uses up scarce land and can be a danger to humans and animals.

Burning plastic pesticide containers in an uncontrolled fire will not destroy the hazardous components completely and may generate environmentally persistent toxic emissions (FAO, 2008). This means that pesticide products and containers should never be burnt on-farm or any other place of use. Only licensed high temperature incinerators and cement kilns with effective emission controls and the appropriate thermal processes should be used to destroy plastic pesticide containers and pesticide hazardous waste. In-order to safeguard human and environmental health, growers must follow the triple rinse procedure as outlined below.

## How To Clean Empty Pesticide Containers? The Triple Rinse Procedure

**Follow these steps X3 Triple-rinse your used pesticide containers!**

1. Quarter-fill the container with water.
2. Close the container and shake for 30 seconds.
3. Empty the container by placing it upside down over the spray tank. Hold it there for 30 seconds or more. Repeat these steps 3 times.

Repeat 1 to 3.

Always wear protective clothing.

Protect your health - puncture the container so it cannot be re-used and send to an approved container recycler.

CropLife INTERNATIONAL

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**NB** – Users should rinse containers immediately after emptying to reduce indirect exposure to others. Once the empty pesticide container has been punctured, growers are encouraged to store the containers in a fenced-off storage facility.

### Advantages of Cleaning Containers

- Correct cleaning of containers not only reduces exposure risk for humans and the environment but can save farmers money –an empty container allowed to drip into the spray tank could still contain 2% of its original contents. By rinsing and adding the rinsate to the tank, none of the pesticide is wasted.
- Recycling or disposal of a properly rinsed container should be less expensive and residual pesticide contamination will be sufficiently low for it to be classified as non-hazardous waste.
- Rinsing easier and requires less effort when the remaining small content is fresh and liquid, rather than left to congeal and harden.
- Properly rinsed containers may be recycled into other products rather than requiring their destruction as hazardous waste.

### The General State

Pesticide container management poses a major challenge especially in developing countries. A survey of over 8,500 smallholders in 26 countries, conducted by the Food and

Agriculture Organisation (FAO), found that most farmers were generally aware of the need for personal protective equipment (PPE) when using agrochemicals and knew simple steps to avoid direct exposure. However, areas such as the need for secure agrochemical stores and the proper disposal of used containers were identified as needing further training.

Zimbabwe like most other developing countries is prone to the risks posed by unsafe handling of containers because of the combination of high usage of acutely toxic insecticides and the reliance on surface water sources for drinking water in rural communities. This is compounded by the fact that there are no agrochemical container collection schemes unlike in most developed countries.



**Growers are therefore encouraged to safeguard themselves, their families and the communities they live in through appropriate disposal of empty pesticide containers.**

For more information, contact Kutsaga Research Station’s Crop Production and Molecular Technologies Division on VOIP 086 88002604 or email: tobres@kutsaga.co.zw or visit Kutsaga Research Station.



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# Tobacco Seedlings and Transplanting

By Tinashe Shanyika and Lloyd Manyani, TIMB

Tobacco is a transplanted crop. Seedlings are produced in either conventional seedbeds or float tray system then transplanted to the field for maturation. Conventional seedbeds use natural soils and basal and straight fertilisers are applied directly into the soil. The latter makes use of trays made of expanded polystyrene or plastic filled with pine bark (soilless) media that contains trace amounts of agricultural lime and fertiliser. This system makes use of complete, water-soluble fertiliser sources that contain appropriate quantities of the macro and micronutrients required by tobacco seedlings.

## A] Float Tray Seedling Production System

Individual tobacco float trays contain 288 to 338 individual cells. Each cell is filled with soilless media, dibbled with a roll bar, and a single pelleted tobacco seed is placed in the centre of each dibble. 20 000 pelleted seed is enough for a hectare. The trace quantity of fertiliser within the media blend is not enough to promote sufficient seedling growth and development. Therefore, supplemental nutrients must be added to the underlying water solution 7 to 10 days after floating and again roughly three weeks later. Small openings on the underside of each float tray allow the fertilised water source to wick upwards to the root zone of seedlings. It takes 50 to 60 days for seedlings to reach a size that is appropriate for transplanting.



*An ideal seedling under float tray system.*

## Benefits of the float tray system

- Uses less water, chemicals, fertilisers and labour.
- Uses less area for seedling production (1/4 of conventional system).
- Produces superior, more uniform, drought tolerant seedlings with high establishment percentage after

transplanting.

- Environmentally friendly as it employs economically integrated management of diseases and pests.

## B] Conventional System

This system is commonly and widely used by small scale farmers in Zimbabwe, whereby actual seedbeds are made on the ground. It is desirable that the seedbed site is changed every year as it will minimise the incidence of diseases, pests and weeds. Deep ploughing of the nursery sites twice during summer months (April-May) is recommended as it will expose and desiccate the eggs and larvae of the nematodes. The soils of the seedbed area should be loamy or sandy-loamy.

**Conventional seedbed preparation** - The seeds are sown on raised beds (10-15 cm high beds having slopes on all the four sides). The seeds are very small; therefore, they need very fine tilth.

**Soil sterilisation** - Soil sterilisation is important to protect the growing seedlings by killing nematodes, weed seeds, soil-borne diseases and eggs or young insect-pests. The sterilisation of beds may be done in the following two ways:

- Burning** - Burning is the process of incinerating trash, weeds or any organic refuse on the soil surface. 15-20 cm thick layer of leaves, weeds or paddy straw is uniformly spread over the soil surface and then it is burnt destroying established weeds, stubble's, weed-seeds and kills the insect-pests found on the surface-soil besides improving physical properties of the soil.
- Sterilisation by chemical treatment** - This treatment is done by applying nematicides, fungicides and herbicides on the soil surface.

**Seedbed layout** - The beds should be about 1.2 meters wide (to get 1.0 m wide bed after tapering) and of convenient length but not more than 30 meters. There should be 0.5-meter-wide channel between the beds. The beds should be 15cm higher than the side channel.



*Conventional seedbeds.*





**Seed selection and seed treatment** - Tobacco seed should be of high purity and germination for economic and healthy seedling production (farmers must use TRB certified seeds). A seed rate of 5g/ha is found to be optimum for all types of tobacco. Higher seed rate results in over-crowding of seedlings, which in turn lowers their quality and induces diseases like “damping off”.

**Sowing time of seed in nursery**- The sowing time of seed in nursery varies from area, region to region guided by tobacco legislative dates which recommend the start of seedbed production on the 1st of June of each year for irrigated crop. Dryland seedlings sowing time depends on climate of a particular tobacco growing region.

**Application of Fertilisers** - For steady and uniform growth of seedlings in the nursery, it is essential to apply fertilisers in the soil. Basal application of 1.4kg of compound S per 10 square metre bed and min of 50grams of Nitrogen fertiliser per 10 square metre.

### Agronomic Care of Tobacco Seedlings

For raising healthy seedlings, the following points should be taken into account;

- To minimise damage to the young seedlings from scorching sun or from beating rains it is necessary to mulch the nursery by a thatch prepared out of grass, coarse sand and perforated plastics. The shading also minimises water loss from the beds, besides, the bed surface does not crack or become hard.
- In order to keep the beds moist, they should be irrigated initially by using a watering can every evening but there should be no water accumulation at any spot of the bed. Later the beds are flooded with controlled flow of water.
- The seedlings must be thinned out 10 to 15 days after sowing in order to protect them from damping-off.
- The seedbed should be kept weed free throughout the seedlings growing period.
- The grass mulch should be removed soon as the seedlings have two leaves.
- Routine spraying for fungicides at recommended rates should be maintained to prevent spread of fungal diseases.
- For control of pests’ routine spraying of a combination of different pesticides is required.

**Clipping** - This is removal or cutting part of the leaf area to slow the growth of the seedlings and maintain seedling uniformity in the seedbeds.

**Hardening** - This is the intentional stressing of the tobacco seedlings by withholding water and or nutrients supplies to enable them to survive when exposed to harsh field conditions (14-28 days before transplanting).

**Pulling** - During pulling process, the beds must be watered copiously to facilitate the pulling of the seedlings without injury to the root system

### Transplanting

- After seedlings are uprooted from the nursery beds, they

become ready for transplanting.

- Before transplanting, a hole with a capacity to hold 3 to 5 litres of water must be made with a hole at each intersecting point of lines drawn by a marker with desired spacing both ways after soil surface is completely levelled.
- One seedling must be planted at each planting station or hole and the soil is pressed all-round the seedling to provide a firm foot-hold for the plant. Gaps are filled within 10 days of planting.
- Transplanting of smaller or younger seedlings causes a higher percentage of gaps while aged or woody seedlings result in a poor growth of plants and thus both the types have a tendency to lower the yield of cured leaves.
- Above all an ideal seedling must possess the following characteristics, robust root system, stem pencil thick (10mm), stem length of 15 to 17cm, 8 to 10 leaves below the bud level and must be uniform.



### Healthy established crops from well-mannered seedlings.

For more information on the tobacco crop husbandry, contact the TIMB team on [info@timb.co.zw](mailto:info@timb.co.zw) or call 0772 145 166-9.

**Backlink** - For more information on tobacco seedlings please refer to ZiMunda Farming Newsletter Issue 3, A Brief Guide on the Grounding Work for Seedlings by Eloise Maloney Ripple Mead Farm, Rusape and Issue 20, Grow Better Tobacco Seedlings to Boost Your Crop by Tegan Buchanan and Helen Simon.

# Wheat Grain Fill Management and Harvesting

**Langton Mutemeri, Research Manager  
(A.R.T Farm)**



Proper management of the winter wheat crop is essential as there are many challenges that can be faced from grain filling stage to harvesting.

During the late grain-filling period, **Quelea birds** may consume much grain and reduce yields significantly if not addressed. A pesticide molecule called 9,10-Anthraquinone 50% WP (Bird Shield) has been developed, which can be used as a seed dressing or as a foliar spray at the soft dough stage. Efficacy of this pesticide molecule can be enhanced by applying with a sticker and a rain fast period of 4 hours or more. This pesticide molecule will function as a bird repellent. This is the best and the most efficient option. Another option for bird management is bird-scaring using bells, tins, whistles, discs/reflectors, etc. by bird-scaring gangs. Quelea feed on the seeds of ripening and mature annual grasses. Being intensely gregarious birds, they breed and roost in enormous colonies in the vicinity of the ripening wheat. It is a legal requirement that such colonies be reported to the nearest National Parks Officer or Agritex who will organise for spraying to be done.

Ripening wheat in drier areas may sometimes be attacked by **termites (white ants)** which bore into and hollow out the stem from the base of the plant. The grain head and stem

become prematurely white. The cause of the damage may be confirmed by cutting open the stems of affected plants and finding small termites and earth inside. Control is not exceedingly difficult as one simply has to band spray affected areas.

**Diseases** such as Leaf rust, Stem rust, Powdery mildew, Fusarium head blight, and Take-all may cause yield reduction. Farmers must seek professional advice on how to control these diseases. The best bet is for farmers to grow resistant varieties. Two preventative fungicide sprays are recommended if farmers are in disease-prone areas and give some form of insurance against climate change that can result in new disease pathotypes. Conditions can change quickly in the field and regular scouting helps to stay on top of what is going on. Favourable conditions can quickly lead to a significant incidence of disease or insect population development.

## Wheat Harvesting

The date of the wheat harvest is the annual decisive moment for the wheat grower. No matter how shrewd his choice of variety, how careful the husbandry, or how kind the weather and insects, without the careful choice of harvesting equipment and skilful operation of it, the wheat grower may well lose a high proportion of his crop through poor harvesting techniques. Although the various makes of combine harvesters may differ in certain basic features, (e.g., drum and concave vs axial flow) all machines are capable of satisfactorily harvesting wheat. Most of the machines are self-propelled types but a few are tractor p.t.o. powered machines exist and there is currently renewed interest in these smaller, less expensive models. A generous portion of the crop is harvested by a contractor; it is not essential, therefore, that a new grower obtains his own machine, although the convenience factor of ownership is a major consideration.

**Combines** are quick and efficient having a minimum labour requirement. The combine can be used on other crops,





including soyabeans, sorghum, and maize if a maize head is available. Transportation of grain to depots can take place directly from the field providing that moisture content is not above 12.5%. Land preparation for the summer crop can begin immediately. The disadvantage of combine harvesters is that they are expensive to own and difficult to justify unless large areas of wheat and other crops are grown or unless contract work is also contemplated. It is necessary to start combining the crop at a moisture content (above 14%) which requires artificial drying. An elevated level of management is required to avoid losses both during the field operations and during the drying and handling process.



Ideally, **wheat in Zimbabwe** should be harvested when dead ripe (i.e., 12-14% moisture content) to minimise operations and achieve the most efficient harvesting. Bulk handling of wheat is the prerogative of those close to bulk depots and saves the problem of bagging. Bagging trailers that are high-sided and have sloping decks have openings cut in the sides of the trailers which can be shut by a sliding shutter. There is an attachment for grain bags at each opening. The grain from the tank on the combine is augured directly into the bagging trailer from which the wheat is bagged off, and six labourers should be able to bag off sufficiently to keep up with the combine: i.e.

- One worker moving grain in the trailer.
- Two workers bagging.
- Two workers weighing, topping up, and transporting.
- One worker sowing.

It should not be necessary to dry wheat if the crop has been planted at the correct time and the correct variety chosen, then combining should be completed before the rains. However, owing to combine shortages, etc. it is often necessary to combine wheat at a higher moisture content than normally desired and then artificially dry the crop. It should be remembered that wheat should not be dried using a temperature higher than 450 C.

The majority of **combine operating problems** can be traced to improper adjustment. Always refer to the operators' manual of the combine for specific adjusting procedures and settings. The following remedies should be applied with caution. Every effort should be made to understand the combine and why adjustments are necessary. When solving a problem, make sure that its source does not come from somewhere other than the apparent cause. For example, a plugged cylinder may result from improper feeding at the feeder house, rather than an improperly adjusted cylinder. For many problems, specific attachments are available to meet various ground and crop conditions. When experiencing difficulties, make every effort to correct the problem before purchasing extra attachments. If the combine is correctly adjusted, any special attachments will not eliminate the problem.

### A Guide to Field Losses

There are approximately 25 700 grains of wheat per kilogram. A 50 kg/ha loss spread over the field would show as a count of 128 gains per m<sup>2</sup>, approximately 13 grains in a 0.1 m<sup>2</sup> measuring frame. Losses may be assessed in this way. When using a combine fitted with a chopper and/or spreader a rough assessment of losses may also be made with a measuring frame randomly placed in the stubble. When using a combine that is not fitted with a spreading device the measuring frame may be used in the straw windrow when a count of approximately 50-60 grains (per 0.1 m) will indicate a loss of 50 kg/ha. While the combine is working place the measuring frame on the ground (or stubble) under the combine ahead of the straw and chaff discharge. Any grains collected in the frame are counted as cleaning or separating losses. Any grains found under the frame will be cutter bar and pre-harvest losses. Unthreshed heads are drum or threshing losses. In general, a total crop loss in the field greater than 1 to 1.5% requires remedial action. Repeat the collections from the frame two or three times before making any adjustments.

Happy Harvesting!!!!



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## 5. Plant All Risk

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# Welcoming A New Competitive Seed Company to Zimbabwe

A testimony of social and agronomic empowerment can be witnessed by strides such as that made by **Zamseed (Pvt) Ltd**, a well-established Zambian seed company which is stepping into the Zimbabwean Agricultural space as **Zimbaseed (Pvt) Ltd** to emulate successful crop yield production as seen in Zambia.

The company's core values are hinged on INTEGRITY, and in order to gain worthy feedback from local Zimbabwean farmers before launch, Zimbaseed ran a season long (2021/2022) Farmers Assessment Programme (FAP) using one of their newest maize varieties (ZMS623) which showed promising results in testing phases. During the programme, 250 participating farmers from around the country made up of individual farmers, farming groups and institutions (schools and churches), were provided with 2kgs of ZMS623 maize seed, 50kg of Damara Compound D and 50kg of Ammonium Nitrate top dressing for trial. Distribution of the inputs and agronomic guidance was assisted by local Agritex officers throughout the season. Zimbaseed collected information directly from farmers and this was used to point out 25 winning farmers

according to performance indicators such as their engagement, farming practices and nationwide voting.

Following the success of the programme, Zimbaseed (Pvt) Ltd was officially launched on the 26th of August, 2022 in Harare. The event launch was graced by farmers, institution representatives and

ministry delegations. The set up was flashy and exciting, giving Zimbaseed the launch it deserves.

During the launch event, 25 winning farmers received prizes which included farming equipment such as knapsacks, supplies such as seed, and fertiliser and a New Holland tractor with plough for the winner. Zimbaseed believed that the tractor will fully empower the winner Mr Lazurus Chapendama from Shamva "It's an undeniable advantage for farmers

to have a tractor to assist with their field management, for the winning farmer we surely believe that this will change their life!" said Maxwell Mataka, Zimbaseed Agronomy and Programme Representative.



Mr Lazurus Chapendama happy to win a New Holland tractor and plough.



## ENTERING THE MARKET WITH SUPERIOR HYBRID MAIZE VARIETIES



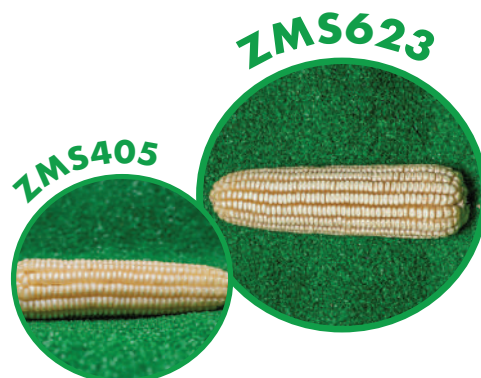
"Our experience with ZMS623 has been very successful this season our cobs are big and very nice."



"My Zimbaseed crop is performing well despite challenges with the weather"

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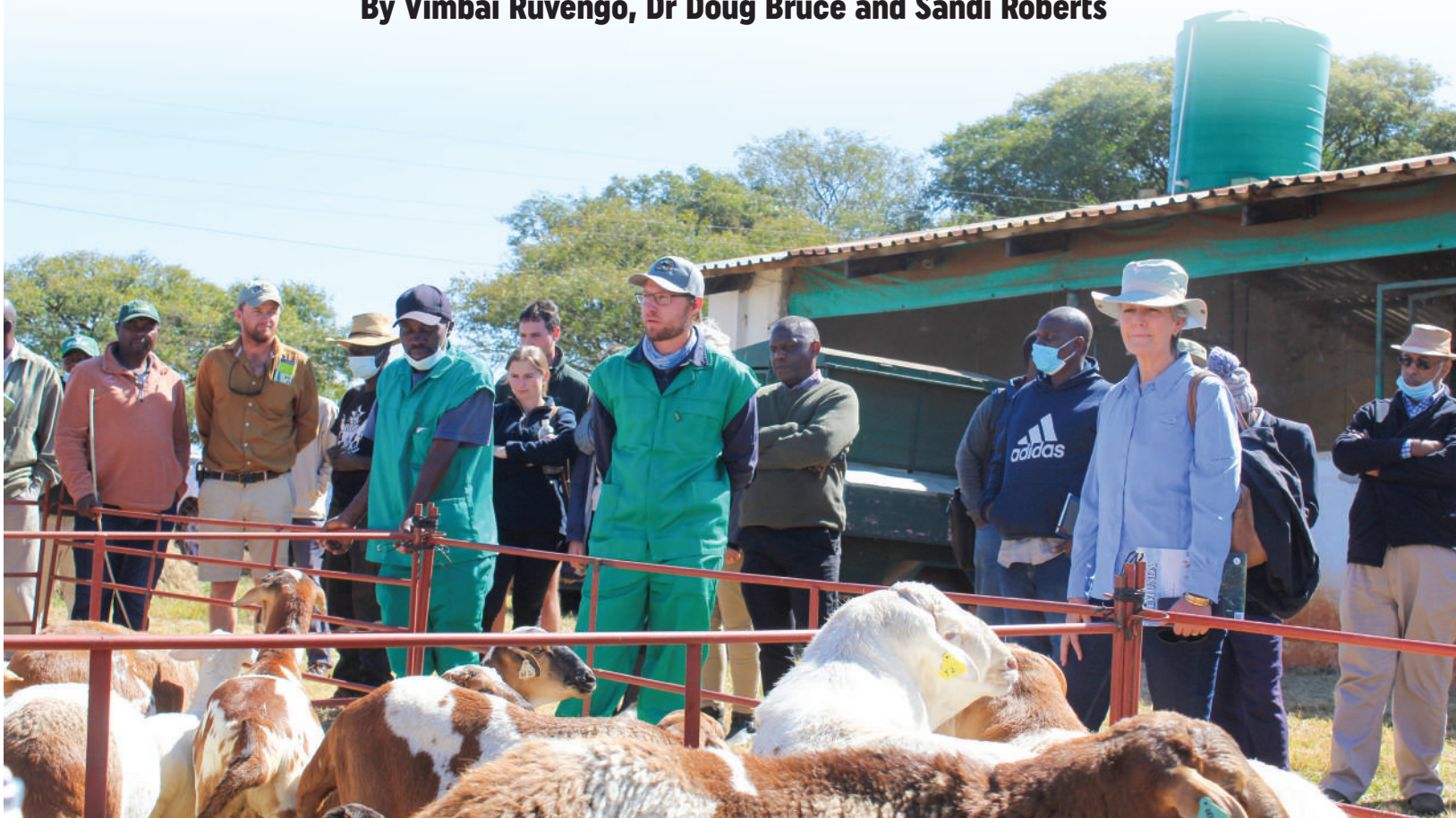
**GOODSEED**

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# The Fat-Tailed Nguni Sheep

By Vimbai Ruvengo, Dr Doug Bruce and Sandi Roberts



The indigenous sheep of Zimbabwe, presently occur in relatively small flocks, scattered throughout the semi-arid parts of the nation. These sheep are hardy and agile and besides their sometimes shaggy short-haired coats, they are distinguished by their large, fat tails.

## A Touch of History

The breeds' origin is not entirely known but has likely followed the Bantu tribe migrations over the Zambezi River many centuries ago. They are similar to the indigenous African sheep found in Ethiopia and the Sahel pastoral regions, stretching across north Africa, south of the Sahara Desert. In the past, these indigenous sheep were referred to as Sabi sheep as they were commonly found in the Save river valley. Those found in the Zambezi valley system are similar but appear to have longer and larger tails and they have been referred to as Nguni sheep.

## Characteristics

- Horns - present or absent in males. If present they usually have only one twist and the females are usually polled.
- Ears - short and carried horizontally or slightly drooping; vestigial small "mouse" ears can occur and is hereditary.
- Neck – has a high head carriage compared to exotic wool sheep with a well-developed brisket.
- Various colour variants are possible-white, tan, brown,

black or red and are commonly speckled or have patches. The coat has short hair with very little wool.

- Fat tails-they have large fat tails and rumps similar to the Persian sheep of Biblical times and the Middle East area. The tails often extend below the hocks.

Because the breed often has a small frame and is poorly muscled, its use as a breed for commercial lamb and mutton production has been limited. Due to its hardiness and being adapted to our hotter drier environments it can be used for crossbreeding with exotic breeds such as the Dorper. These are often referred to as Meatmasters. In neighbouring South Africa indigenous breeds such as the Damara were used to create the Meatmaster breed.

## Advantages of the Nguni

- Fertile with excellent mothering abilities – ewes are protective of their young.
- Tolerant of external and internal parasites.
- Moderate sized frames with relatively low maintenance requirements.
- Do not need to be sheared.
- Do not require a high level of management.

The fat tail is an adaptation trait serving as an energy reserve in times of drought and adverse conditions. This gives the Nguni a great advantage as the bulk of the agricultural landscape in Southern Africa is arid or semi-arid. Being able



to adapt to arid environments, the sheep can markedly contribute to the livelihood of farmers in arid areas.

The value of indigenous breeds in terms of adaptability and robustness can be used as a selling point for smallholder farmers. Good husbandry by these sheep farmers under a low-input system would allow them to market their products as organic or free range.

### The Nguni Sheep Breeders Society

The awareness of the value of indigenous livestock breeds in Zimbabwe is gaining momentum in recent years with several

institutions prioritising this matter with a mission to facilitate and promote the conservation of indigenous farm animal genetic resources. With this in mind, the Nguni Sheep Breeders Society is in the process of being established with a mission to promote the breed. To this end a small breeding herd has been established at Art Farm, Pomona with foundation animals sourced from the Dande and Mushumbi Pools areas.

### ART Farm Advanced Breeding Centre

The Advanced Breeding Centre, established in May 2022 by Bargrove Veterinary Group serves as base for Nguni sheep research. The team at the Centre are working on recording the performance of the breed under ideal conditions. These measurements include weights for age, longevity, fecundity, lamb survival, age at first lambing, disease and parasite tolerance and resistance. Indigenous breeds are often seen as poor performers but little is known of their performance traits and it is this that is hoped to be quantified at the Breeding Centre at ART

*These Nguni sheep are far from inferior, they are hardy and prolific under adverse conditions, producing admirably under the low maintenance conditions that are typically found in the marginal dryer areas of Zimbabwe.*

For further information on the Nguni Sheep message Sandi Roberts on 0772142675.

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# Institutional Strides in Fisheries

By Milton T. Makumbe and Lorraine K. Salimu

*The Department of Fisheries and Aquatic Resources - Contributing Towards a Future of Improved Household Food and Nutrition Security, and Income Generation Through Fish and Aquaculture Production in Zimbabwe.*

Due to the domination of the fish farming sector by tilapia species in Zimbabwe, Aquaculture is loosely termed ‘Fish Farming’. However, the species of culture span from fish, crustaceans to aquatic plants and crocodiles; allowing the sector diversification with unlimited prospects of growth. In spite of having a rich abundance of fish species; 144 fish species (114 indigenous and 30 exotic species), Zimbabwe has an estimated annual production output of 10,500 metric tonnes of fish comprised mostly of the invasive Nile tilapia (80% of tonnage). The fisheries and aquaculture sector are still to take flight as there is a healthy abundance in Zimbabwe’s aquatic resources (at least 10,700 dams and other water bodies).



upper middle-income country by 2030 through employment creation, guaranteeing food and nutrition security, import substitution, filling the global fish exportation gap, and raising household incomes using mostly indigenous fish for production with conservation and preservation.

The department’s **overarching goal** is to pave way for strong aquaculture enterprises in a conducive and regulated environment, linking smallholders to domestic and export markets as a means of improving food diversification, better nutrition and a means to generate additional income. The expectation is to ensure that Zimbabwe reaches the 19kg/ person per capita fish consumption ballpark, collectively catering for the entire fisheries and aquatic resources value chain (domestic production, processing and value addition as well as export market promotion). Currently, per capita fish consumption in the country is low in comparison to other countries at 2.6kg/person.



The positive correlation brought about between fish production and the rural economy bloom; food and nutrition security; and employment creation is undeniable. With this in sight and pushing forward the vision 2030 a new department housed in the Ministry of Lands, Agriculture, Fisheries, Water, and Rural Development, the Department of Fisheries and Aquatic Resources, was formed with a mandate to offer advisory services, coordinate, regulate, and diversify food systems as mitigation against crop failure risk as means of growing the fisheries and aquaculture sector in the country. The department strives to implement the **Agriculture and Food Systems Transformation Strategy (AFSTS) (2020-2025)** which seeks to revive, restructure, reform, rebuild and transform agriculture from a USD 5.2 billion sector to USD 8.2 billion sector, contributing 20% to GDP, and making Zimbabwe an

## The Vision

A productive, growing and sustainable fisheries and aquaculture industry contributing to rural development.

## The Mission

To ensure a robust fisheries and aquaculture resources sub-sector that is well developed, managed, conserved and utilised sustainably for economic growth and improved human livelihood, income and employment through





modernisation, commercialisation and sustainable utilisation of natural resources.

The department will adopt an evidence-based model to guide and coordinate the development of specific strategies, projects and programmes, as well as to stimulate transformation of sub-sectors within the fisheries and aquaculture industry. One strategy is the **Presidential Community Fisheries Programme** set to cover communities in areas around dams and other water bodies. The main components of the Presidential Community Fisheries programme include:

- a) Fingerling production for resale to other fish farmers
- b) Community dam and other water bodies restocking for capture fish production
- c) Establishment of cages in dams and water bodies for commercial fish production
- d) Establishment of fish and aquaculture processing facilities for fish and other value-added fish products e.g., fish pastes, and
- e) Introduction of Kapenta for production in selected inland dams.

Though much emphasis in this article has been put on the production of tilapia for obvious reasons, it is important

to highlight that the focus of the Department of Fisheries and Aquatic Resources will also be on growing the crocodile and trout sub-sectors amongst other to diversify the fish and aquatic industry in Zimbabwe.



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# Farming Dorper Sheep

By **Vimbai Ruvengo**, lessons from Daan Bosman and Charl Saunderson

The Dorper is a South African mutton breed developed in the 1930's through the crossing of the Blackhead Persian ewes with the Dorset Horn rams. The breed is barrel-shaped, hornless with short, dull black or white hair on the head and they have short haired with coarse wool. The black headed ones are called 'Dorper' and the white-headed ones 'White Dorper'.

In Zimbabwe, there is a growing interest in farmers to rear Dorper sheep. In April 2022, the Zimbabwe Dorper Breeders Association, held a field day at Bramber Farm in Ruwa. The field day was attended by a number of Dorper Stud Breeders and enthusiasts, who all were eager to learn from the best South African Dorper Breeders;

The two main topics discussed were;

1. What makes a good Dorper Sheep? by Daan Bosman, a consultant for Dorper Sheep and Boergoats.
2. What makes a good Dorper Breeder? by Charl Saunderson, a stud breeder and Dorper judge. The Sheep Farmer of the Year 2021, South Africa.

The article highlights lessons and notes from the two aforementioned guests.

## WHAT MAKES A GOOD DORPER SHEEP?

One of the most important considerations when selecting sheep is conformation. Good **conformation** features include a straight top line; good-sized, strong and straight legs so the sheep can carry itself properly; and good length of body; in ewes, a wide rump with a 15° angle or less from hips to pins to promote easier lambing. Below are some of the points that Daan expanded on;

### • Teeth

Correct dentition is of critical importance to the maintenance of body condition/weight gain in adult sheep. It is essential for sheep grazing rough pasture. Examination of incisor teeth alignment is performed by running an index finger along the dental pad, with the sheep's mouth closed and the head held in the normal resting position. This examination reveals any teeth projecting forward of the normal contact on the dental pad (overshot jaw) or behind (undershot jaw). When undershot the teeth meet the gum back from the edge and when overshot the teeth stick out beyond the gum edge and can be very sharp as they have not been worn down with biting off grass. Sheep with undershot mouths have great difficulty in eating short pasture.



Daan demonstrating how to check for correct dentition.

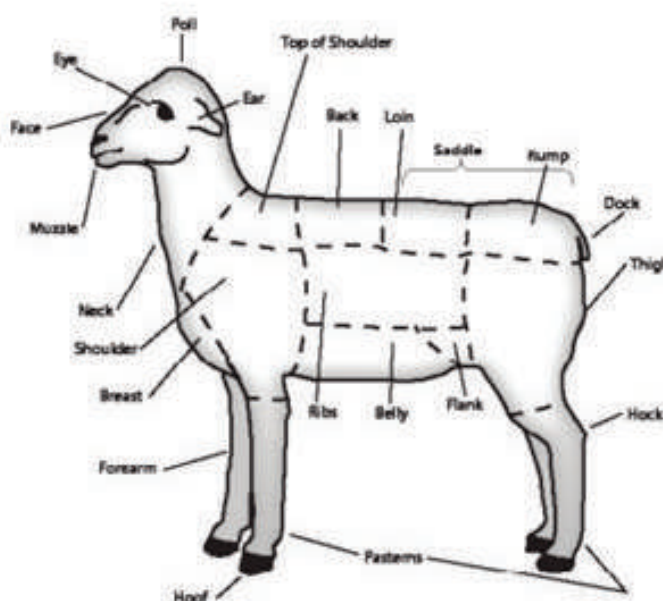


Undershot jaw in lamb-incisors meet well back from gum

### • Femininity in Ewes

Daan emphasised that 'femininity is not negotiable. **The body shape** of a good ewe to be kept in the herd must be a triangle to the back i.e., narrow on the shoulders and broader to the back. If the ewe is too narrow to the back, she will experience lambing difficulties.

The **size of the ewe** is directly related to the feed and the breeder's preference. With the former, a tough start for the ewe in its younger age results in smaller ewes and in the latter a breeder can exclusively choose whether or not they want small bodied females or large ones. Challenges presented by a small ewe is the birthing weight of lambs. If there is not enough frame in the animal, she will not be able carry a large lamb to deliver in 100 - 120 days. Consequently, the enterprise can be affected negatively impacted.





Dan Bosman teaching about what makes a good dorper sheep

A long body, neck and rump are most ideal for **the body length** of an ewe. Daan stressed that the rump is the most expensive part of the ewe as it has an economical value. *“The rump is the most positive traits of confirmation statistics; its length is directly the best trait compared to reproduction. The longer the rump the easier it is to produce a lamb and vis-à-vis. If the rump is short the ewe will birth through caesarean”* said Daan.

• **Masculinity in Rams**

Good rams must be a triangle to the back with broad shoulders and a narrower back. The neck should be of medium length, well-fleshed and broad. Shoulders should be firm, broad and strong. Forelegs must be strong, straight and well-placed with strong pasterns and hoofs not too widely split. Weak and crooked legs must be discriminated against.

**WHAT MAKES A GOOD DORPER BREEDER?**

After a coffee break, the attendees sat for the second section of the field day, where Charl elaborated on what makes a good breeder. Charl started off by reminding every farmer present that they have Responsibility to Feed the Nation. And to fulfil this responsibly a farmer must ask themselves the following questions;

- What is my strategy (define the goal)?
- Where do I want to be with

my sheep? What must they look like and how must they perform? With these questions in mind Charl noted that one then goes on to look at each ewe and ask ‘how that sheep is going to get you to your goal’.

- What am I going to do to get to my goal?

**Being an Excellent Shepherd**

Charl started this part of the talk by giving an analogy of getting a team for a rugby team to take to Japan; as a Shepherd (rugby Coach) you start off with 150 young ewes (rugby players), but you only need a 100 to take to Japan. What do you do?



A good example of feminine ewes



*Charl Saunderson inspiring farmers on how to be good shepherds.*

1. The 150 ewes with exceptional genetics are put in with a ram that has been tested for fertility and is the absolutely the best. After six weeks, conduct a pregnancy scan; if she not pregnant she is culled. Because the ewe was well looked after (health and nutrition), it will pay well at the abattoir.
2. Thereafter, all the ewes that lamb difficult when giving birth are taken out.
3. After weaning, walk through the lambs and take out the lambs that's are not good enough for you. These can be sold together with the ewe because she does not breed to your standards.
4. After weaning the ewes to be kept are rested for a month before putting in a ram again. After 6 weeks take out the ram and scan for pregnancy. Those not pregnant are taken out for sale – your worst ewes might be other farmers best.

As an excellent Shepherd (Coach), you not only choose the best players (ewes); those which earned their place to stay need to be managed well;

- Mate them at the right age.
- Treat the flock for worms and parasites.
- Vaccinate accordingly against diseases such as pulpy kidney.
- Mate the ewes in a no stress area. Do not put them in a new group just before mating, there must be ample shade, clean drinking water and no predators.

Being an excellent shepherd results in good production – Charl encouraged the farmers to look after their players well.

**Words of encouragement from Charl;**

- You are the ceiling of your farm or enterprise – if you stop growing your farm stops growing. Always aim to do something to grow your ceiling by developing yourself.

- Farm with passion despite the fact that every level of success has its own devil. There are challenges that are faced at farms as we grow. The challenges must lead you to learn more so that you find solutions.
- Invest in school fees money – Charl yearned farmers to educate themselves.
- The eye of the shepherd fattens the flock – it is important to look at the ancestral reproduction performance history of the sheep and bloodline characteristics. Breed replacement animals that are better than your worst ewe or ram.

**For information on Dorper Sheep, download a free copy of ZiMunda Farming Issue 5 (vaccines and vaccinations) and 25 (mating and record keeping) on [www.zimunda.co.zw](http://www.zimunda.co.zw). For inquires contact the Zimbabwe Dorper Breeders Association on 0712 208 590.**



*Excellent and masculine rams.*



# Health and Nutrition Management

By **Admire Dube**, Fivet Animal Health

Health management is an important and integral part in goat farming. Its components such as general health management, parasite control, vaccine management, environment management and proper record keeping are important for productivity. Health management at farm level should be implemented at all ages; pregnant does; new-born kids; youths; and adults. Proper care of new-born kids helps reduce the mortality rate.

**NB** – The statement ‘*prevention is better than cure*’ stands true in livestock production. In well-mannered farms, goats are healthy, have unshakable immunity and quick disease recovery rates. In case of disease incidences, farmers must quickly consult a vet doctor and get the appropriate treatment. If left too late disease progression may prove difficult to treat leading to mortalities.

Symptoms of a Sick Goat	How to Keep a Healthy Flock?
-Stays away from the rest of the herd. -Low physical growth rate.	-Familiarise with major diseases and vaccinate against these diseases.
-Standing hunch with a coarse and dull skin.	-Feed adequate quality feed along with clean water.
-Fast pulse speed (it can be felt by touching interior side of rear thigh), shallow breathing, variant temperature than usual and a stinking breath.	-When bringing in new stock, thoroughly screen and take all biosecurity measures.
-Floating saliva from mouth etc. -Droopy, poor or no appetite.	-Keep ailing goat/s separately and do not mix with healthy goat/s.
-Red eye, runny and watery eyes.	-Control of internal and external parasites.
-Loose faeces, mixed with blood or mucus. -Dark yellow pee and sometime blockage of urine.	-Construct a good shed to protect the herd from unsuitable climate.

## Appropriate Nutrition in Goats

Nutrition is comprised of 7 elements, carbohydrate (source of energy), protein (physical growth), fats (source of energy), minerals, vitamins and water. Goats are known to be hardy as they can consume meagre feeding, forage or fodder.

### 1. Pregnant and Parturition Goat

— In the last month of the parturition date, extra attention has to be given to the doe as it needs more nutritious feed and quality fodders.

— Lactating does require more feeding for example an additional 350g of feed per litre of milk production.

— Nutrition must include 1% minerals, 1% calcium and phosphorous (through mineral blocks). Molasses can be added to the mix for extra nutrition.

— Avoid overfeeding as obesity in pregnant does may lead to complications during labour.

**NB:** If does are fed adequately before mating, there is high chances of having twin gestation.

### 2. New-Born Kids

New-born kids must be fed colostrum within 1 hours of birth. Colostrum provides immunity to kids and is essential for intestinal cleansing (defecation of first soft faeces). Diarrhoea may occur if the kids are left to overfeed on the milk. After

3-4 months, soft legumes grass can be introduced to the kid's diet.

### 3. Goat Weaning Management

Since young kids consume small quantities, the feed must be highly nutritional for example a flour mixture made from maize, barley and bran. This can be continuously fed from 4 months till mating age. High protein containing forage and feeds such as soybean curd, soybean husks and residue of oilseeds etc are essential for the kid's growth and meat production.

### 4. Buck Management

— Feed adequate protein-rich feeds in correct amounts every day based on the weight of buck. 450-500g of concentrate feed has to be fed per xxkg of animal per day.

— A breeding buck needs a sufficient exercise. An obese buck is not efficient in mating. Thus, in timely manner, weight of buck should be monitored.

### Parting Notes

— Feed twice daily (morning and evening) and change water at the same time.

— Monitor feed and

fodder quantities; if the container is usually empty it might be that the feed is not enough.

— Avoid overfeeding, it may cause bloating and obesity.

— Provide balanced feed for the flock.

— Evaluate what the goats eat as they are picky and selective for grasses.

— Provide young leave and buds as they are enriched with protein and phosphorous.

**Admire is an Animal scientist with a degree in Animal Science from the University of Zimbabwe. For any livestock questions, contact +263785584918 or admiredubee@gmail.com**



*A healthy goat in an excellent body condition.*

# ADMA in Pictures

Images by Amanda Manyarara



1. Upon arrival, we were greeted by mega machinery.



2. Moving on, exhibitions of excellence in solar engineering and technology were displayed by companies such as Solar Energy Projects.



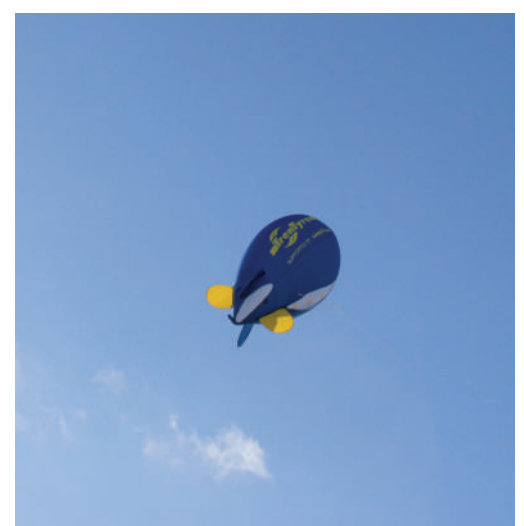
3. One could then spot displays of irrigation such as Driptech's superior orchard sprayer.



4. All around the show there were demonstrations of innovation to empower commercial farmers.



5. Beautiful and eye catching product displays by companies such as Damara Bio-Agri were drawing in crowds.



6. There was strong and engaging advertising at the show, with Driptech and Trentyre taking it to the sky.



7. A small John Deere tractor was seen leisurely moving around the show with a cutie of a driver!



8. Fun time for kids as they enjoyed bull riding.



9. Despite the chilly weather, the ADMA show made a great family day out; hoping for another eventful show in 2023!



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### Premium Tyre Brands

1. Agricultural sector - **Trelleborg**, and ably supported by European manufactured brands **Mitas** and **Cultor**.
2. Mining sector - **Michelin** for specific operations, Boto and Aeolus (Chinese brands) for over-the-road mining needs.
3. Industrial solid tyres - **Trelleborg, Solitrac** and **Standard**, dependent on usage and need.

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**Repairs** - The well-trained staff in the Rema Tip Top Accredited repair centre based at Portland Road are kept extremely busy with a reputation for quality handiwork using premium products.

**Breakdown Service** – We provide a breakdown service for tyre related problems for both local and South African fleets moving through or into Zimbabwe.

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is being requested more and more by our mining and other off-the-road customers. The features and benefits of these two products can be discussed with the sales team as necessary, and a solution found for your needs.

**Rim Supply** - We represent Rimex (a Canadian owned brand) for OTR rim replacement needs and are the agents for Trelleborg for agricultural and industrial rim applications. Our technicians have had extensive training on the various products and on rim conversions. As a result, we offer **Rim Conversions** and this has proven extremely useful for our farmers.

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# Drone Spraying in Wheat Management

By Farmbuzz Agriculture Solutions (FAS)

Pests are known to cause catastrophes and drastic reductions in food grain production across the globe. Quelea birds, armyworms, wheat aphids etc. are typical threats to wheat cropping. A Quelea bird can consume 4 grams of wheat per day and a million birds can result in losses exceeding 40 000 tonnes per year.

In Zimbabwe wheat is largely grown by commercial farmers on large hectares, pesticide spraying using knapsack and boom sprayers can prove to be expensive (labour cost and fuel/hiring respectively). The use of drone technology for spraying is now a more cost-effective option for farmers. Drone spraying uses battery power which is faster and cheaper than using fuel, thus saving the farmer time and money.

## Benefits of Drone Technology in Wheat

Farmbuzz Agriculture Solutions first introduced pesticide spraying using drone technology in 2020. This initiative has proved to be quite beneficial and more acceptable to wheat farmers., FAS has noted two major benefits of using drones in wheat pesticide spraying in the two years since introducing drone spraying i.e.

- i. Drones use more than 20% less chemical quantity compared to that used by boom and knapsack sprayers.
- ii. The downdraft produced by a drone's rotors increases the penetrability of the chemical into the crop (the wind opens up the wheat crop, allowing higher penetration and reach of the chemical into and around the crop).

As a way of managing pests, drone technology monitors or observes the farm or the field from an aerial view. Information on pest infestation and plant health can then be accurately extracted from the drone pictures and management steps can be set.

## Crop Health Scouting

Wheat fields are expansive, it can result in low efficiency in crop pest monitoring, which creates significant challenges

to farmers. Pest monitoring challenges are exacerbated by the densely packed wheat crop; making it difficult to scout for pest physically.

Drone health assessment is essential to assess crop health and pest infections on plants. A drone can scout for areas with crop infection and spray that area instead of spraying the whole wheat field for pests which again saves time and chemical. By scanning a crop using both visible and near infrared light , drone carried devices can identify which plants reflect different amounts of green light and near infra (NIR) light . A speedy response can thus save an entire wheat field . As soon as pests and diseases are discovered, farmers can monitor and apply chemicals using the spraying drone more precisely . These possibilities increase a plant's ability to overcome pests and diseases. In a case of crop failure, the farmer will be able to document losses more efficiently for filing insurance claims .



## Drone Spraying

The most common pesticide chemicals in wheat pest control are Chlorpyrifos, endosulfan, pirimiphos-methyl and chlorpyrifos-methyl. These chemical concentrates are mixed with water before use using manufacturers recommended ratios and filled into the drone tanks before it is sent up for spraying. The drone then uses a set program to control pressure from the pump, sending out the required solution through spray lines and nozzles into the crop.

A Quelea bird repellent solution can be used to control the birds.

The use of drones in Quelea bird control minimises the risk of the birds flying into 'hidden' spots where ordinary boom sprayers and knapsacks cannot reach. Drones give maximum coverage hence maximising control and management.

**Drone spraying offers a large potential to unlock economic empowerment in wheat production, not only by improving crop quality, but also provides effective pest control and cost reduction. Reputable companies such as Farmbuzz Agriculture Solutions provide cost effective drone-spraying services.**

For more information contact Farmbuzz on marumeema@gmail.com or call 0776 169 347

# A Quick Guide to Rearing Replacement Layer Pullets

By Lovemore Mutetwa, Animal Nutritionist

The management activities in a layer rearing unit extends from about 2 months to about 4 ½ months of age. A general pullet rearing program involves provision of suitable environment or shelter, feed, and water, applying good animal husbandry and handling practices, managing flock health through basic hygiene, implementing biosecurity and veterinary care programs, among other operations. The choice of which layer breed to use is normally at the discretion of the producer, but it is a general alignment that dark feathered breeds are easier to manage and more resistant to adverse local conditions vis-à-vis the brown-feathered breeds.

## Rearing Replacement Pullets

The physical condition of the pullet at the time of sexual maturity may determine its productivity during the laying year. Most producers rear their own pullets from day old stage until the point of lay. This is generally much cheaper and safer than purchasing ready-to-lay pullets whose rearing records and history may sometimes not be readily available, thereby posing a potential risk to the pullet buyer. Raising your own pullets allows the producer to have control and plan the periodic replacement of his / her laying stock with birds that have been raised under their own standards of housing and management. Other producers may specialise in raising pullets and then sell them off when they reach point of lay.

In Zimbabwe, most pullets are reared almost exclusively using the deep litter system, i.e., on the floor as opposed to the use of cages. Each method obviously has its pros and cons. However, rearing in an open-sided house then changing to a closed house for production should be avoided at all costs as it will have negative effects on the onset of lay and lifetime performance of the layer birds. All the poultry management operations including bird handling, weighing, vaccinations, beak trimming and selection, inter alia during the rearing phase of pullets must be managed with minimum bird stress to avoid delay in the onset of lay. Management guidelines and generic performance standards from the pullet breeders should be followed, but more importantly adapted or adjusted as necessary to the local prevailing conditions for a successful rearing program.

## Feeding Regime for Pullets

By far the most critical item in a layer rearing unit revolves around feed. Feed accounts for up to ~70% of the total variable costs of a poultry production enterprise. The prudent producer will therefore plan thoroughly all the feed requirements to avoid feed stock-outs and achieve optimum bird development in order to achieve high peak performance and long persistency of lay.

The feeding program for pullets should be carefully managed so that they do not gain weight excessively and reach sexual maturity prematurely. This would result in associated problems of egg-binding, prolonged small egg sizes for age and overall reduced egg production during the cheaper option) using feed concentrates mixed with cereal grains or mineral-vitamin maxi packs mixed with extracted soyabean meal and cereals. Others prefer to use purchased feeds from commercial stockfeed manufacturers for feeding out of the bag. The nature of the pullet growers' feed is in "mash" or "powder" form (not pelleted) and the target feed consumption during the rearing period to point-of-lay is about 5.5 to 6 kg per pullet. One way of controlling the growth rate is by practising feed restriction of the Layer Growers or Developer feeds. This is done in a number of ways;

- The first and most common method is to give a known amount of feed once in two days. In between the feeding days, the birds can be given greens to reduce boredom and possibility of feather pecking.
- The other method is to lower the protein content in a feed so that consumption is reduced, and growth slowed. This latter method presents a disadvantage that birds tend to overeat to compensate for nutrient deficiencies and may require consultations with a feed expert.

Whatever is the adopted regime to control weight gains, it is however very important to achieve 6, 12-, 18-, 24- and



A deep litter system at Bushman Rock



30-week target body weights for the selected layer breed in order to achieve optimum development of the birds' body. Ideally, it is better to exceed target body weights than to be under weight. Layer birds with good muscle development are better able to sustain higher egg production which has bearing on overall profitability.

### Lighting Program for Replacement Pullets

Light intensity, the length of the day light period and the pattern of daily change produce biological responses associated with egg production in layers. Decreasing day length during rearing will delay onset of laying, while increasing day length will hasten sexual maturity and the onset of laying. As a result, pullets raised from the months of December / January through to June / July are considered in-season as the natural day-length in Zimbabwe will be decreasing. Conversely, pullets raised during the months of August through to December are considered out of season since daylength will be naturally increasing, hence the need to manipulate lighting for these birds to avoid early maturity.

The onset of lay or sexual maturity generally depends on the following factors:

- (i) minimum age 18 weeks which is determined genetically,
- (ii) a minimum body weight (about 1.5 kg for most breeds),
- (iii) a nutrient intake to support egg production and
- (iv) a constant or increasing day length of more than 12 hours. This light stimulation can be provided artificially when the minimum liveweight weight has been achieved.

For the duration of the entire rearing phase from about 3 weeks (post-brooding) up to about 18 weeks, maintain a constant day length of 10 -12 hours or to that dictated by natural light in open houses. Provide light stimulation by providing artificial lights at 18 weeks of age (or when the minimum liveweight has been achieved) starting with a minimum of 13 hours and increase by 15 –30 minutes per week until 16 hours is reached. Light stimulation at lower body weight result in below normal egg sizes.

Measuring light intensity is also a challenge on most poultry units, but in practice, the key issues in ensuring correct light intensity are:

- (a) Keep the light bulbs clean free of dust,
- (b) Do not expose the birds to direct sunlight,
- (c) Replace faulty bulbs regularly,
- (d) The use of a light source with a reflector to increase the amount of light.

It is worth noting that implementing an artificial lighting program can be a challenge in Zimbabwe given our open-sided poultry housing, but if combined with the proposed feeding regimes as outlined above, it can however still be implemented with a high degree of success.



**An example of an Open-Sided Poultry house at Bushman Rock.**

Consequently, as demonstrated by field experience, most flocks in the country suffer a delayed onset of lay to as much as 25 weeks of age leading to a panic by most of the affected producers! Producers should however note that the onset of lay is determined by physiological maturity, rather than the chronological age of the bird and that a delay in onset of lay does not have any real negative effects on overall lifetime performance during the egg production cycle.

### Milestone Events for Pullets

Further to the above, the key managements events for raising pullets can therefore be summarised in the table as follows:

## Important Considerations

TIME /PERIOD	MILESTONE
DAY 0 – 21	Brooding phase.
DAY 7	First on-site vaccination and continues to week 16 according to local area disease profile.
DAY 7- 10	Beak trimming if not done in the hatchery.
WEEK 3	Start monitoring body weight again target every 2 weeks and calculate bird uniformity to achieve about 90% at point-of-lay.
WEEK 6	Re-trim beaks (if necessary) with last trimming at 12 weeks.
WEEK 7 – 13	Check and remove off-sex (males) among the flock.
WEEK 10, 15 & 21	De-worm the birds.
WEEK 16 – 17	Transfer pullets after the last vaccine to laying houses to allow them to settle early.
WEEK 17 - 18	Start light stimulation when pullets have reached 1.4 – 1.5kg liveweight.
WEEK 18	Start feeding a pre-lay ration when most pullets show a reddening of combs. Pre-lay feed can be a blend of pullet grower/developer feed and layers feed and is fed for 2 weeks prior to the onset of lay.

Any major deviations from the above management protocols may lead to a disaster often resulting in pre-mature culling of the laying flock. Therefore, to promote animal well-being and produce laying birds of the highest quality, these goals and principles mentioned above are the essential building blocks for the humane and professional care of our birds with the ultimate laying performance being dependent on each step of the pullet rearing phase being completed successfully.

For more information on layer hen management and pullet husbandry contact Lovemore on [lovemoremuetwa8@gmail.com](mailto:lovemoremuetwa8@gmail.com) or 0774 586 536.



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# All About Heat Stress

By Dr Phillipa Chengeta, Livestock Technical Consultant



A well-ventilated hen house.

Poultry production is a livestock sector highly affected by changes in seasons. Poultry do not have sweat glands unlike human beings therefore, in the summer heat, farmers must constantly be aware of what is happening with their birds and take appropriate corrective measures.

**Heat stress** is a condition caused by high temperatures especially when combined with low air speed and high relative humidity. Scientific studies indicate that heat stress begins when the ambient temperature rises above 26.7°C and becomes very apparent above 29.4°C. The internal temperature of an adult bird is around 40°C – 41.66°C. If this internal temperature reaches 43.3°C – 45.6°C, the bird is in danger of death. Heat stress occurs when the bird's core body temperature rises to fatal temperatures due to poor heat loss and limited coping mechanisms.

Some predisposing factors include genetics, feather coverage, heat acclimatisation, drinking water temperature, and availability. Older birds, heavy breeds, and broilers are more susceptible to heat stress.

## Immediate Signs of Heat Stress

- Reduced feeding activity.
- Increased water intake.
- Panting and laboured breathing.
- Pale combs and wattles.
- Birds lifting wings away from the body, and squatting closer to the ground.
- Lethargy, a general lack of energy and enthusiasm.
- Seizures, convulsions and staggering.
- Wet droppings/ diarrhoea may also be more visible.

Heat Stress in poultry can be a serious threat to the bird's overall productivity and cause reduced production efficiencies. The following are some of the effects farmers can look out for:

- A drop in production
- Increased mortality rates in a flock.
- Reduced growth rates.
- Less mating in breeding flocks leading to low fertility

- Reduced hatching rates.
- Changes in egg quality – smaller eggs, thinner layers, thinner shells and generally poor internal egg quality.

When a flock is affected by heat stress the production losses are very variable depending on the type of bird as well as extent of exposure. In the case of broilers, feed consumption is reduced, birds delay in attaining target weights and size. If there is overcrowding in the cage or shed, there will be a high amount of heat generated.

## Ways to Reduce and Alleviate Heat Stress

- The poultry shed must be constructed to ensure free air flow; with a distance 10-20 meters if near other buildings or walls to ensure good air flow.
- The height of the shed is critical, particularly with small scale farmers who tend to build small sheds-the lower it is the hotter the shed.
- Use of proper chick mesh on the long, 50 cm side walls to ensure adequate air movement.
- Painting the roof white to reflect the sun away from the shed will reduce the heating effects.
- Covering or painting the water tanks white will reduce the water temperatures to ensure birds always have cool drinking water. Small scale farmers can use ice in the water.
- Providing correct nutrient levels in feed.
- Providing cool, clean, low salt water at all times.
- Ensuring that feed is made available during the coolest part of the day. Farmers can remove feed from the birds by deliberately lifting the feeding system before the afternoon peak temperatures. Once the peak temperature is over, feed may be reintroduced. Removing the feeders reduces the birds' heat output due to feed metabolism.
- Feeding can be done early morning or at night when temperatures are cooler.
- Leave the birds alone during the hottest part of the day. Allow them to stay calm with minimal absolutely necessary disturbances.
- Sticking to correct stocking densities which for broilers are 10 birds per square meter and layers are 8 birds per square meter. Putting fewer birds in each house helps reduce the heat produced, do not understock or overstock.
- Adding stress pack (electrolytes) to water, electrolytes help balance the electrolytes in the bird and encourage them to drink more water.
- Providing protection from the sun especially for free-range poultry.
- Providing well ventilated and comfortable environments for the birds, a misting/ fogging system can be installed in naturally ventilated spaces.
- Walk the birds gently but not in a disturbing manner, to encourage air circulation around the birds and stimulate water consumption.

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