



ZiMUNDA

FARMING

NEWSLETTER
ISSUE 5 | JULY 2020

AGRO-TECH

ENERGY IMPROVEMENTS IN
TOBACCO CURING BARNs

LIVESTOCK

SHEEP HUSBANDRY
VACCINES & VACCINATIONS

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Vaccines and Vaccinations

BY ROSE VAN DE RUIT

The following excerpts related to sheep farming are taken from the Sheep Handbook of Zimbabwe and reprinted with the kind permission of **The Dorper Sheep Breeders Association of Zimbabwe**.

Sheep farming is gaining popularity in Zimbabwe and is extremely rewarding if done properly. The Dorper Sheep Breeders Association of Zimbabwe is there to help its members succeed, and membership is open to all wanting to know more about farming sheep and goats. Sheep husbandry is a huge topic so these excerpts were chosen to provide useful information to help with the management of your sheep flock.

Prevention is better than cure, and there are a number of good vaccines available to help prevent or reduce the occurrence of disease outbreaks. Vaccines are made from live, modified or inactivated organisms which are very sensitive to effects of temperature, sunlight and disinfectants. Keep at temperatures between 2–7 °C **at all times**. A single power cut can destroy the vaccine. Always buy your vaccines from a reputable outlet which should have all vaccines in a reliable fridge with loggers to record the temperature fluctuations. Always plan your vaccination programme well ahead of time to ensure that your supplier has the vaccine in stock. Collection of the vaccines requires that the farmer must take a supply of frozen blocks in a cooler box to ensure the vaccines are kept cold for the duration of the trip.

Always read the instructions on the pamphlet before proceeding with vaccinations.

Live vaccines are just that, and usually cause a reaction which may affect the animal, and often the foetus. A live and a killed vaccine may be given together, and two killed vaccines together, but not two live vaccines together. Most vaccines are given subcutaneously, unless otherwise instructed on the pamphlet. Most recommended vaccinations are annual, but where a

particular problem occurs, the vaccine may be boosted. This particularly applies to pulpy kidney, which may be boosted 2 – 3 weeks after the first injection, especially animals entering feedlot situations. Lambs under one month of age are not usually vaccinated as they have acquired maternal immunity from their mothers, provided the mothers have been vaccinated against the disease in question. Vaccines given too early will actually be neutralised by the maternally derived immunity from the dam.



VACCINATION PROCEDURE

Vaccination is stressful to both animals and staff. Bring animals in the day before to settle them down and start vaccinating early in the morning before daytime temperatures rise. Be quiet. Vaccines must be kept in the cooler box in the shade and sterile syringes and needles are ready. Ideally use a separate needle for each animal but this may not be practical and a regular change of needle is acceptable. Be clear about the correct administration of the vaccine i.e. intramuscular or subcutaneous as per vaccine pamphlet instructions. Farmers generally use the opportunity to dose, dip and vaccinate on the same day. Ideally this should be avoided

due to the stress of the 3 procedures. Always be aware that pulpy kidney disease is a very important disease in sheep and goats and that all stock must be vaccinated adequately before dosing, changing feed, transporting etc.

VACCINE FAILURE

Sometimes animals fail to respond adequately to the vaccines used, this may be due to:

- The vaccine was inactivated by poor handling, break in the cold chain, contact with disinfectants, etc.
- The vaccine may have been given by the incorrect route or the wrong dose.



- The vaccine may not contain the protective strain of organism i.e. a new strain/s of Blue tongue virus.
- The administration of antibiotics simultaneously with live bacterial vaccines will destroy the vaccine e.g. long acting penicillin simultaneously with anthrax vaccine.
- The immune response was poor due to poor condition of the animal, high worm burden, concomitant illness, and any severe 'stress'.
- An animal already incubating a disease when vaccinated **will not respond adequately to the vaccine.**

THE DRUG CUPBOARD

It is important for farmers to keep necessary drugs and medications to deal with emergencies on the farm.

- **Antibiotics** - Long acting tetracyclines are very useful in some infections such as heartwater. However, the newer synthetic long acting penicillins and their combinations have a particular use for clostridial diseases and pasteurellosis. The important issue when using antibiotics is to use the recommended dose for long enough for the appropriate disease. Bear in mind that drugs have varying withdrawal periods which need to be considered when slaughtering animals for human consumption.
- **Anti-inflammatory drugs** - Today more use is made of non-steroidal anti-inflammatory drugs which reduce inflammation, help to combat shock and toxæmia and, very importantly, to reduce pain in the animal. Their use must be encouraged as healing can be accelerated dramatically but they must be used correctly.

Ophthalmic (eye) infections All eye preparations must be applied at least twice daily. Ointments generally

work better, but are more expensive and are packed in very small tubes. Powders tend to be wasted unless care is taken on administration. Another approach to treating ocular disease is to use subconjunctival injections.

- **Vitamins and tonics** - There are a multitude of oral and injectable vitamins and tonics available for use in sick and healthy animals. There are two treatments which are important in sheep and goat production.
- **Vitamins A, D & E** - Used in combination, especially during the dry season, for animals on poor grazing, and also for lambs with ill thrift.
- **Vitamin E/selenium** - Given to lambs in a flock where deficiency has been diagnosed.
- **Oral electrolytes** - Useful for cases of dehydration following diarrhoea.
- **Vinegar** - Must be available when feeds containing urea are fed. The dose is 2–4 tablespoons in 50 ml water. Also good for sick animals which are inappetent and mild bloat.
- **Sodium Bicarbonate** - Must be available when animals are being fed high energy feed, and dosed as soon as symptoms of acidosis are seen. The dose is 2 tablespoons in 50 ml water, and repeat after an hour if there is little, or no improvement.
- **Ammonium Chloride** - Used for urinary calculus. The dose is 10–15 g, daily, for 14–21 days, suspended in 200 ml water. Vitamin C, or ascorbic acid can be used at a dose of 1 tablet per 4 kg, daily, for at least 7 days.
- **Topical treatments for wounds** - hydrogen peroxide and povidone, wound oils and fly repellents, insecticidal topical acaricides.



- **Sodium thiosulphate** 'Hypo' for prussic acid poisoning. Hypo can be used as a prophylactic.

- **20 L molasses** for ketosis or in impoverished cases.

- **Universal antidote** (activated charcoal) for poisoning.

Images provided by Yara Hanssen

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Increasing Dairy Profitability Using Sexed Bull Semen

BY DR. NATHANIEL F. MAKONI AND EUNAH MAKONI

African Breeders Services TCM Limited

Dairy farming is a business and one of the factors contributing to farmers' profitability is production of a calf, preferably female, by a cow annually at the lowest possible cost. A male calf does not have much economic value in a dairy enterprise. When properly reared, female calves eventually join the herd as replacement heifers, or can be sold for a premium as quality bred heifers. Female calves are usually born with lower birth weights than their male counterparts, thus, imparting calving ease (CE).

There are **new technologies** aimed at rapidly building efficient productive dairy herds including use of sexed or Gender Sorted (GS) semen. GS semen is semen containing sperms to produce more progeny of a desired gender with an average accuracy of 90%. In comparison, conventional semen produces progeny at a male to female ratio of about 50:50. Traditionally, GS semen would contain a lower concentration of sperm per straw; approximately 2 million cells compared to approximately above 10 million for conventional semen. This is partly attributed to the damage during the sorting and other biological processes. Thus, the conception rate is usually 10 - 20% less with GS semen than with conventional semen, hence the recommendation to use it on heifers.

Fortunately, Sexing Technologies LLC semen sorting technologies are continuously improving. The improvements include upgraded sorting machines, removal of dead sperm cells which usually poison live sperm and use of buffers that pre-capacitate (the process the sperm cells go through before penetrating the female egg) the semen.

THE BENEFITS OF USING GS SEMEN INCLUDE:

- **4 % fewer calving difficulties:** Calving difficulties can increase days open as the calving animal requires more time for the reproductive system to recover. Easy calving allows calving heifers to settle faster into the milking herd, thus, likely resulting in higher milk yield as the cow is under less stress. With an easy calving the cow will likely have no future fertility problems usually associated with difficult calving.

- **Genetic gains:** Prudent dairy farmers use performance records for their herd ranking and aim to breed from their best cows. However, if these cows produce bull

calves, they will be forced to recruit heifer calves from the poorer performing cows as herd replacements. Thus, use of GS semen on the best cows of the herd can be a strategy to produce quality replacement heifers and to enhance genetic progress on the farm.

- **Increased herd size:** GS semen gives producers the opportunity to breed replacements for the herd without having to spend large amounts of money on heifers and also avoid the associated risks of bringing replacements onto the farm which can introduce disease and undesired genetic traits.



- **Income diversification:** With up to 90 % chances of getting heifer calves, dairy farmers can produce extra heifers for sale.

In conclusion, the use of GS semen in artificial insemination services increases the birth of heifers on both beef and dairy farms, resulting in both faster herd growth, and rapid genetic improvement. Furthermore, it is important for farmers to understand that GS semen now comes as three different products of varying fertility that is, unpurified GS, pre-capacitated and cleaned GS Sexed containing 2 and 4 million sperm cells. Pre-capacitation and increasing sperm cells to 4 M concentration also results in fertility comparable to ordinary bull semen.

For more on GS/sexed semen contact:
+263 778223367, +254 722700355 or info@abstcm.com

Images provided by African Breeders Services TCM Ltd





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Vermicomposting

BY DAVIDZO CHIZHENGENI

Animal Scientist at KDV Consultancy & Services

Vermicompost or worm compost is one of the highest-grade and most nutrient-rich natural fertilisers in the world. Its soil conditioning properties and plant-strengthening effect encourage the growth and yield of the crops. It is a black, odourless and crumbly substrate with a balanced nutritional composition for plant containing an above-average number of micro-organisms which revitalise the soil, and loose yet stable soil structure (clay-humus complexes).

of the soil, the compost should not be over 60 cm deep.

Location of Worm Compost - The compost heaps can be distributed between rows of trees, or housed in shelters.

Climate - The *Eisenia fetida* is very tolerant to a wide range of temperatures varying between 0 - 30°C, and is therefore, well suited to locations in the open air. To ensure that the earthworm bed does not get too hot, shade trees or a roof should protect it from direct sunshine. Fresh manure must first be pre-fermented. The humus should not be too moist since it can otherwise lead to an infection of the female reproduction organs.

NUTRITIONAL COMPOSITION OF VERMICOMPOSTING AND CONVENTIONAL COMPOST

Nutrient element	Vermicompost	Conventional Compost
N - Nitrogen	1.9%	1.4%
C/N - Carbon-Nitrogen ratio	13.6	20.6
P (%) - Phosphorous	2.0	1.8
K (%) - Potassium	0.8	0.7

Eisenia fetida (hard workers) - Of the over 3,000 species of earthworms, the most frequently used species of compost worm is the red wiggler (*Eisenia fetida*), which is naturally predisposed towards high rates of conversion and reproduction. *Eisenia fetida* grow to a length of 6 – 13 cm on average. They are reddish in colour, with yellowish rings, making them easy to distinguish from other species.

TRANSFORMATION RATES OF ORGANIC MATERIAL:

- Between half and the whole of the equivalent of its body mass a day
- Under perfect conditions: 3,500 worms (approx. 1 kg) devour 1 kg kitchen waste a day
- 200 - 300 worms can convert a volume of 1 m³ and 20 cm depth into worm humus within 60 days
- Of the 100% source material, 15% is what remains in the form of worm compost

CONSTRUCTION OF A VERMICOMPOST



Reproduction - The good living conditions in the compost make the development cycle of *Eisenia fetida* the shortest of all earthworms, with a correspondingly high rate of reproduction. The young worms hatch 3 weeks after the eggs are laid and are sexually mature within another 9 weeks. The worm population doubles every 3 months (4 generations a year) resulting in 500 - 600 offspring per worm per year.

Feeding - Ideal feeding intervals are 10 - 30 days. Compost worms, have a huge appetite, they feed on almost anything from vegetable to animal sources. They feed on animal excrement from cattle, horses, sheep, pigs, poultry, goats, hares and donkeys. The worms are particularly partial to cattle excrement. For this reason, cattle manure is the most commonly used source material for worm composting. However, green and nutrient rich plant waste (hay, grass, silage, weeds, leaves foliage, banana, and orange peelings) is often also composted; matter which rots slowly on conventional compost heaps. The waste used should be of preference from organic agricultural sources. In terms of feed particle size, the basic principle is 'the finer the material offered to these energetic workers (worms, microbes, microorganisms), the faster its conversion'.

1. Bedding - To create a perfect climate, a "worm bed" is made by using coarse materials such as shredded twigs, mulch or wood shavings/sawdust as a basis, varying according to what is available locally. All the components should have been produced organically.

2. Feed - The next step is to cover the worm bed with a layer of feed matter consisting of vegetable waste and manure.

Size of the Worm Compost - Most compost heaps are 1-2 m wide, 30 - 50 cm high, and can be as long as desired. Since, *Eisenia fetida* is an epigeic species, i.e. a surface dweller which works in the upper layers



3. **Introducing the worms** - The worms are added to the compost heap in batches.



and continue conversion. The older material can then be harvested and, if necessary, left to mature.

Vermicomposting Application Rates -

The harvested material can be applied on any crop, at any stage, but it is more beneficial if mixed in soil after broadcasting. The rate of application is as follows;

- field crops 5 - 6 t/ha
- vegetables 10 - 12 t/ha
- lower plants 1-2 kgs/m²
- fruit trees 5 - 10 kg/ tree

Vermiculture and vermicompost need to be fully utilised in agriculture so as to harness the full potential of growing organic food, as well as to revitalize the soils.

4. **Watering the compost** - The amount of water needed depends on the climate (temperature, evaporation).

5. **Cover the compost heap** - In order to protect the worm population from predators such as birds, rats, snakes, cockroaches and ants, but also from heavy rains, the compost heap needs to be covered. The most suitable materials are: banana leaves, polyethylene foil, wood or corrugated sheeting.

Harvesting - The compost can be harvested in about 2 - 5 months. If the compost heap takes the form of a windrow, the source material is introduced to one end of the windrow and added to continuously. Care should be taken that the new material added is in contact with the old substrate. The compost worms move over to the fresh substrate



Images provided by Davidzo Chizhengeni



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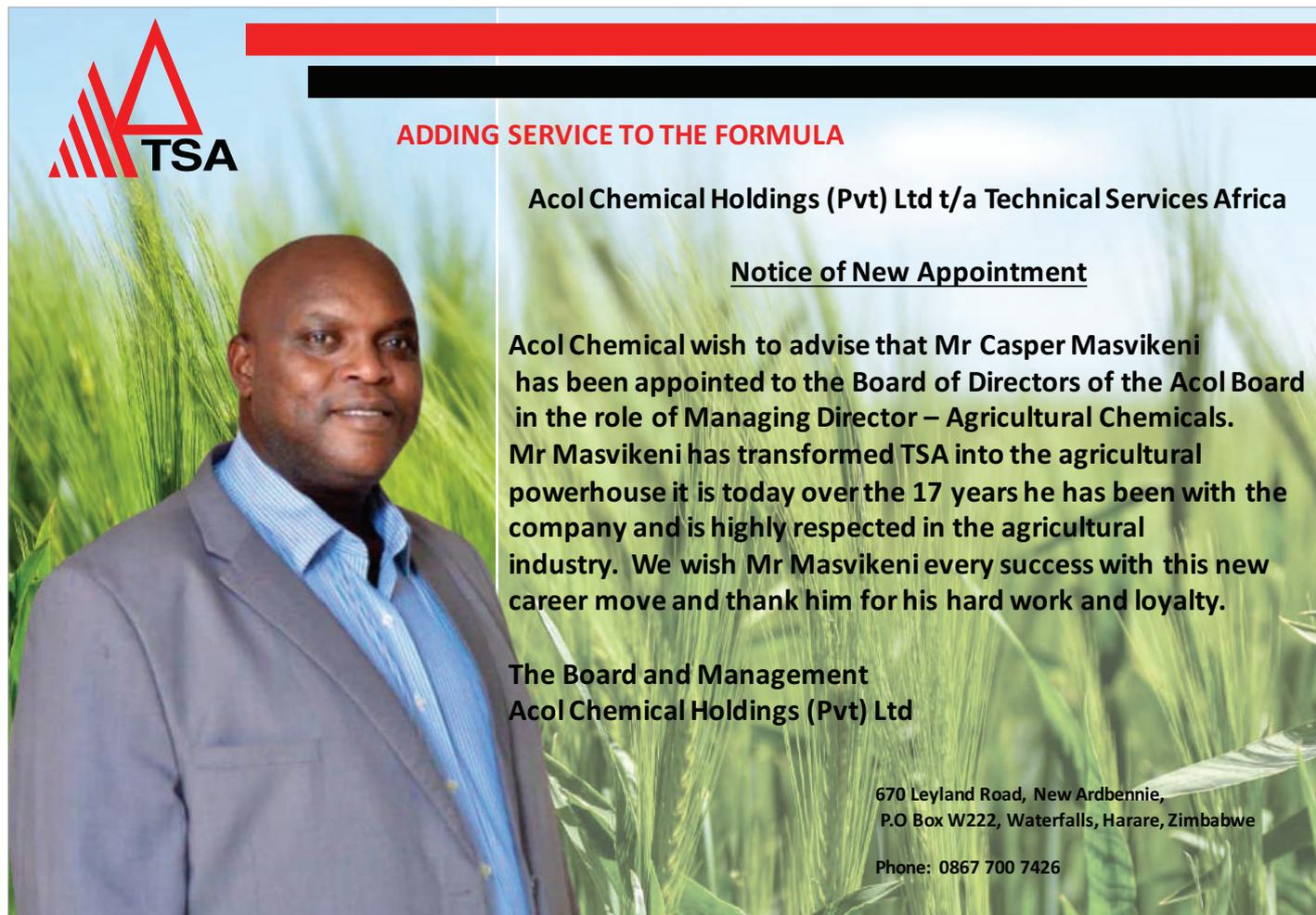
Notice of New Appointment

Acol Chemical wish to advise that Mr Casper Masvikeni has been appointed to the Board of Directors of the Acol Board in the role of Managing Director – Agricultural Chemicals. Mr Masvikeni has transformed TSA into the agricultural powerhouse it is today over the 17 years he has been with the company and is highly respected in the agricultural industry. We wish Mr Masvikeni every success with this new career move and thank him for his hard work and loyalty.

**The Board and Management
Acol Chemical Holdings (Pvt) Ltd**

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TYPE Open pollinated

MATURITY TYPE Early short day

MATURITY IN DAYS 190 - 200

PLANT CHARACTERISTICS	Bulb:	Shape	Deep flat round
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		Exterior colour	Medium straw
		Interior colour	Cream white

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Wheat - Peregrine

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4. Very good disease package
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Cooking Up Compost

A Banquet for Your Soil

BY AMANDA MOYO

Purple Horizon Farm, Kwekwe

“Rice, sadza, roast chicken, beef stew... is your mouth watering? Hay, straw, manure, maize stalks, peanut shells, banana peels... well, this might not be so exciting to you, but it is for your crops, this is delectable, if you cook it right.”

Compost is both highly fibrous and nutritious organic material that needs to be ‘cooked up’ and served back to the soil, so that it can give back healthy and robust crops. Composting is deemed as an easy, God given, and natural way to give back to the soil. It builds up soil structure increasing its efficiency in retaining moisture and releasing a steady flow of nutrients and minerals to your growing crops.

Basically, bacteria, fungi, worms, grubs and beetles are responsible for breaking down the plant and animal waste material in the compost. When residue materials are strategically brought together at one time and in one place, the breaking down process becomes a pile of goodness that supports new and long life. Therefore, be advised not to overlook all those leftovers from harvest time. Start to ‘Collect and Protect’ the material, and apply the art and science of composting. At Purple Horizons we advocate for the excellent methods, instructions and explanations on composting by the Foundations for Farming Organisation.

Thermal Compositing is based on heat creation; where heat (ideally 55-68°C) is created through the decomposing process. The heat kills many diseases and weed seeds. A properly managed compost pile can yield ready-to-use compost within 8 weeks’ time. For small farm holders, an ideal size of compost pile is 1.5m width, 1.5m length, and 1.5m height. The compost pile needs a great quantity of materials; so, start collecting and protecting. Be sure to measure and keep the compost pile in a square shape for best retention of heat and moisture. It is important to flip the pile weekly, this aerates the composting heap, adding oxygen and managing heat generation. It is important to choose a well-protected area to place

away from the reach of livestock that can pose a threat on destroying it. Evenly apply about 100l of water per week to the compost pile.

A compost pile is built up with layers of approximately:

- 40% Dry plant material - anything that has dried up on the field, weeds or crop residues.
- 40% Green plant material - freshly cut vegetation, weeds, cabbage leaves, etc.
- 20% Manure and residues from green legume crops, for nitrogen.
- Extras - Hops from beer making, ashes from wood-based fire, peelings, leaves or spoilt vegetable matter, ashes from crop residue that was burnt to destroy disease or egg shell; basically, anything decomposable.

- What to avoid - animal fat and proteins, diseased vegetation (if you are concerned it cannot be destroyed in the heat process), and too wet material, such as hops, that will suffocate the oxygen flow.

At Purple Horizon farm, we have made and used compost fertiliser for the past 2 years with marked success. It is important to note that, although, we still add conventional fertilisers, we now add them at lower dosages and they stay longer in the soil. We recommend the use of

compost to all farmers. Check out the resources cited above or do your own research, but do not miss out on this amazing practice. The manual labour required in forming the pile, rotating it weekly, and watering it daily, will take some commitment, muscle and time, but the efforts will be well rewarded. Whatever you cook up for the soil and crops will surely be served back to you plentifully, so start cooking up compost.



(Above) Freshly made compost pile with maize stover and other crop residues



(Right) Ready for use cooked compost

Images provided by Amanda Moyo

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Duly's AgriQuip a Key Player in Agricultural Mechanisation

BY RUTENDO CHABURURUKA

A **90hp New Holland** tractor was handed over to a local farmer by Duly's AgriQuip recently. 90hp is a robust tractor suitable for several uses including farming and mining. In mining it is used to move dumper trailers. It is compatible and work perfectly with a 6-tonne dumper trailer. In farming it is popular with farmers who use has a 3-tine ripper. It is compatible with an 18- or 20-disc harrow depending on soils and the make of the harrow.

Dulys AgriQuip is an agricultural and mining mechanisation partner who have a wide range of implements and provide after sales support for New Holland tractors, implements parts and accessories. In terms of implements, Dulys AgriQuip holds the reputable Fieldking farming implements franchise, which has among other tractor-drawn implements; harrows, double coil cultivators, rigid cultivators, disc ploughs, sub-soilers', and 3-way tipper trailers. Dulys AgriQuip, also has Sfoggia planters imported from Italy.

Duly's AgriQuip is part of Duly Holdings. Duly Holdings is the leading Zimbabwean Motor Company specialising

in the retailing and servicing of Ford vehicles, Renault trucks, Nissan cars, Volvo trucks, UD trucks and buses, Higer buses, Eicher trucks and buses, Yutong buses and wide a range of New Holland tractors. Established in 1902, the company is reputed for a sound and stable reputation throughout Zimbabwe for good product,



Nyaradzai Zingoma from Dulys AgriQuip handing over a New Holland tractor and dumper trailer to a local farmer recently

excellent customer after-sales service, fair dealing in the industry and integrity that has held true in over 100years. Having a knack for providing an exceptional level of service in the motor industry to valued customers, Duly Motors opened a dedicated Bulk Parts Department, which subsequently launched the first depot in Harare in 1932, motorists head here for genuine parts, car batteries, car accessories or car care products

to keep vehicles in great shape.

Duly's branches are located in Harare, Mutare, Gweru and Bulawayo to enable customers to access aftersales support. Dulys Agriquip provides farm visits for certain special servicing requirements to ensure productivity on the farm is not compromised.

Image provided by Duly Holdings

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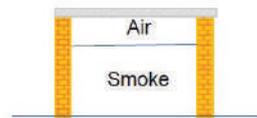
Inexpensive Energy Improvements for Conventional Tobacco Curing Barns

BY TONY LAMPARD

Toltecs (Pvt) Ltd t/a Paramark

In an effort towards reducing deforestation, Toltecs conducted an energy efficiency study in 2011 for SNV (Netherlands Development Organization) focusing mainly on the small-scale tobacco sector, of which none of these had electricity. The scope was purely conceptual therefore, as far as we are aware, no actual improvements were ever built. In our review of existing systems, the simple, inexpensive Malawi slot furnace was by far the best furnace. It also lends itself well to the re-use of barn exhaust as furnace feed air (explained later). The two simple, inexpensive and easily implemented concepts are the Double Flue System and the Recycle to Furnace Feed Air.

DOUBLE FLUE SYSTEM



Double flue is simply creating a chamber above the heat transfer plate where the “bottom vent” air is drawn counter-flow (opposite direction from the coldest end to the hottest) to improve the heat transfer efficiencies. If you have round flues it will be a smaller flue pipe inside a larger pipe. The air can be discharged anywhere in the barn; the Kutsaga Research Station prefer the hot air to be fed to the top of the barn as air has a natural tendency to drop as it cools and becomes saturated. In any event it is easier to ensure a more even temperature distribution if the air is heated before it enters the barn. The intermediate plate is used to transfer the heat so it needs to be conductive, if it is corrugated or finned

to increase the surface area, the heat transfer will also improve. The top of the flue should be non-conductive. The double flue also prevents barn fires.

RECYCLE TO FURNACE FEED AIR

Enthalpy is energy content of the air. When the water is evaporated from the tobacco the temperature drops but some of the energy is captured in the evaporation. This energy can be re-used if it is fed to the furnace fire. If you are familiar with the Rocket Barn you will notice that they use a double chimney to draw the air through the barn to improve the efficiency in the absence of a fan. The fire itself, with a good chimney, has an even more powerful draft effect. By ducting the exhaust from the barn to the underneath of the furnace fire, the fire should be able to utilize the enthalpy and draw the air through the barn. In addition to utilizing the residual energy in the saturated air as a means of saving energy, this also means you don't have to be fastidious when it comes to optimizing the evaporation capacity of the air. You are still re-using the energy at any level of saturation and heat content.

Images provided by Tony Lampard & ZiMunda Farming



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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.

COVER

Dorper sheep at Doddington Farm by Yara Hanssen.

