FARMING

ISSUE 27 | JANUARY 2022

AGRONOMY

DAIRY

Leaching & waterlogging in Field Crops Managing Mastitis

LIVESTOCK

Pneumonia in Sheep & Goats

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MATURITY IN DAYS	190 - 200		
PLANT CHARACTERISTICS	Bulb:	Shape	Deep flat rou
		Firmness	Moderate
		Exterior colour	Medium strav

und Interior colour Cream white

WHEAT EREGRINE

DISEASE TOLERANCE Pyrenochaeta terrestris



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BOTANICAL NAME	Allium cepa L.		
TYPE	Open pollinated		
MATURITY TYPE	Early short day		
MATURITY IN DAYS	190 - 200		
PLANT CHARACTERISTICS	Bulb:	Shape	Deep flat round
		Firmness	Moderate
		Exterior colour	Medium straw
		Interior colour	Cream white

DISEASE TOLERANCE Pyrenochaeta terrestris





OUR TEAM

PUBLISHER

Mike Garden mikeg@softrite.co.zw Cell: +263 772 209 162

EDITOR

Vimbai Ruvengo editor@zimunda.co.zw Tel: 024 278 2720 Cell: +263 782 117 840

OFFICES

37 Victoria Drive, Newlands, Harare



ADVERTISING Rudo Nhamoinesu

Tel: +263 772 639 304

pr@softrite.co.zw

DESIGN & LAYOUT

Tamuka Nyoni content@nzira.co.zw Cell: +263 775 363 706

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

Immersion dipping at Panganai Boran Stud, Wedza.

What Farmers Should Know About Theileriosis

By the Late Peter Jackson of Animal Health Products/Environmental Health at Cooper Zimbabwe.

Theileriosis is a disease caused by protozoa called **Theileria parva bovis** which destroy white blood cells in the lymphatic system and the lungs. The degree of the disease varies in severity from an acute form where the cattle die after 2 to 3 days of illness to a mild form where symptoms may not be noticed. Up to 80% of visibly infected animals die. Recovered animals, whether treated or not, remain carriers of the disease for life.

HOW DO BROWN EAR TICKS BECOME INFECTED?

By feeding on carrier animals when at the nymphal stage, around August and September.; nymphal ticks feed, engorge and fall to the ground to change into adults. Adults are ready to start feeding from November onwards. In other words, the infection is on the ground in certain paddocks or on certain farms where nymphal ticks have dropped from carrier animals during August or September. Ticks cannot walk far on the ground and so do not move from farm to farm except when carried on an animal.



HOW CAN THEILERIOSIS SPREAD TO MY FARM?

1. When carrier animals are introduced onto a farm and there are nymphal Brown Ear ticks on them. The infected adult ticks then feed on your cattle from December to March.

2. If carrier animals from neighbouring farms stray onto your land and nymphal Brown Ear ticks on your farm feed on them or if carrier cattle bring nymphal Brown Ear ticks with them which drop off on your farm.

3. If your animals stray during the summer months onto a farm where there are infected adult Brown Ear ticks on the ground.

WHAT SIGNS DO SICK ANIMALS SHOW?

The disease usually occurs between December and March and it may exhibit the following symptoms;

 Animals become very sick and show signs of difficult breathing, which progressively worsens until the animal dies.
 All superficial lymph nodes are swollen.
 The eyes may be cloudy.

4. There may signs of struggling on the ground.

5. Salivation (drooling) and lacrymation (abnormal or excessive secretion of tear).6. Immunosuppression.

WHAT SAMPLES SHOULD BE TAKEN TO CONFIRM THE DISEASE?

The protozoa are found in the lymph nodes, spleen and lungs, pieces of these organs and or smears from them should be submitted for examination to the Veterinary Department or a private veterinarian.



Spray dipping - sprayers are arranged to throughly drench the animal.

HOW CAN THEILERIOSIS BE CONTROLLED?

A. Control of the Tick Vector

All ticks have basically the same life cycle and go through the following stages: -

Egg » Larva » Nymph » Adult.

Adult female ticks, after mating on the host, fall off and lay eggs on the ground. The eggs hatch into larvae which feed, engorge and change (moult) into nymphs. The nymphs feed, engorge and change into male and female adults. Flat adult ticks climb onto cattle to feed. The females increase approximately 50-fold in size before falling off to lay

LIVESTOCK

4



A cow taking a plunge - immersion dipping.

eggs. Brown Ear ticks moult on the ground. Therefore, each succeeding stage feeds on a different animal. The life cycle of these ticks takes approximately one year. Each stage becomes particularly active and numerous at a certain time. This means that the different stages of the tick are mostly seen at the same time each year. The peak periods of activity are roughly as follows:

- Adults December to March
- Larvae April to August
- Nymphs August to October

These ticks also have short engorgement periods. Each stage spends less than a week feeding on a host. Therefore, it is relatively easy to control them by effective short interval dipping at the periods of activity of each of the three stages. It is particularly effective at the nymphal stage because these ticks are not inside the ear but are on the external surface of the head. They are also much easier to kill than adults.

Animals should be examined to ascertain when periods of activity begin.

If nymphs are not effectively controlled, and adults are numerous in summer:

- Hair must be clipped from inside the ears and from the tail brush to expose the attachment sites to spraying and dipping;

- It may be necessary to hand dress ears;

- It is difficult to control all ticks where small herds graze large pastures; and

- It is possible to eliminate Theileriosis from an infected farm by short interval dipping throughout the year for a number of years.

B. Control of Animal Movement

- Prevent animals straying onto your land during August and September as they may introduce infected nymphal ticks;

- Prevent animals straying during December to March onto land where there may be infected adult ticks on the ground; and

- Avoid acquiring animals from Theileriosis-infected farms, as the presence of carrier animals in a herd is probably the most important fact in maintaining the threat of subsequent outbreaks. (This is almost impossible if you speculate since many commercial herds contain carriers). LIVESTOCK

WHAT TREATMENT MUST BE GIVEN TO SICK ANIMALS?

- Good nursing by provide food, water, shelter, shade and protection as well as injecting the anti-protozoal drugs such as BUPARVEX at the rate of 1ml/ 20kg body weight.



Buparvex an intramuscular injection used by injecting into the muscles of the neck is recommended- observing normal aseptic precautions

Theileriosis is still a **NOTIFIABLE** disease and any outbreak must be reported to the Veterinary Department. At present,

Buparvex can only be prescribed by a Veterinary Surgeon and supplied by a Veterinary Surgeon or Pharmacist.

- Treatment with oxytetracyclins such as **Coopermycin LA** at a rate of 1ml per 20kg is recommended in addition to **Buparvex.**

- **Coopermycin LA** can be used alone in treating Theileriosis in low grade infections but is not effective once they have a fever (40 deg celsius and above).

The turbulance created by the diving animals achieves a good penaration between the animal's hair.



DO CATTLE BUILD UP AN IMMUNITY?

Cattle may develop an immunity, but it cannot be relied on for control. On many farms the disease occurs year after year. **The only reliable prevention** *is sound dipping and management using* dips such as Triatix, Supadip, Decatix, Amitik or Spoton. In the event of an outbreak farmers should move to 5-5-4 dipping to break the life cycle of infected ticks.

a) At a dosage rate of 1ml Spoton per 10 kg body weight apply from ear base to ear base, on the tail head and as a strip down each side of the midline from shoulder to rump.

b) Decatix must be diluted with water before use. Premix the required quantity of concentrate with approx. 10 times its volume of water. Add the mixture to the bulk of water in the dip tank or spray race sump.



The Department of Veterinary Services has developed a vaccine using a milder strain which provides an immunity. At one time it was administered with a covering injection of tetracycline. With an adjustment in the dose, this is no longer necessary.

'Vaccinated animals remain carriers after vaccination'

If there was a more virulent Theileria infection on the farm at the time of vaccination, vaccinated animals will also become carriers of the virulent strain without showing symptoms and they will be able to transmit it to a new generation of ticks. If vaccination is discontinued, this virulent strain will still be present in those animals and in ticks which have fed on them. Non-vaccinated animals and your neighbours' animals are again at risk.

The article was reproduced with kind permission of Cooper Zimbabwe. For more information on the control of Theileriosis, contact 086 77 000 329 or call Dr Choga on 0773 724088.

Cattle dipping images provided by Panganayi Boran Stud Wedza and the spray race was provided by Natgrow Agriculture (0772 451 763).



A fully dipped cow exiting the dip tank

RHIPICEPHALUS:

R. appenddiculatus: Brown Ear and "Eye Tick" (2 species: 1 found on the Highveld and the other in the Lowveld, R. zambeziensis)

R. simus: Glossy Brown Tick or "Heel Tick"

R. tricupis, R. compsitus and R. sanguineus (Brown Dog Tick) The female lays 3,000 to 5,000 eggs.

Pre-oviposition period	5 – 40 days
Eggs hatch (summer)	28 days
Eggs hatch (winter)	3 months
Larvae engorge	3 – 7 days
Larvae moult	10 – 49 (28 days)
Nymphs engorge	3 – 7 days
Nymphs moult	10 – 61 (34 days)
Females engorge	4 – 10 days
Unfed larvae survive	7 months
Unfed nymphs survive	6 ½ months
Unfed Adults survive	14 months



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Drainage in Field Crops

By Ivan Craig and Vimbai Ruvengo

Rainfall in Zimbabwe can be low or erratic; the dilemma is to balance between two vital but opposing requirements with respect to water management. On one hand, there is need to harvest and conserve every drop of rain in order to mitigate effects of dry spells; on the other hand, there is need for safe disposal of excess water caused by heavy storms or incessant rains in order to conserve soil and protect growing plants. (Nyakudya IW, 2014).

Climate change is an external influence perspective named a Risk /Opportunity Perspective in the whole farming systems or agro-ecosystem analysis concept. Its importance as a risk factor to farmers in Zimbabwe's is reflected by the frequency of both droughts and heavy rainfall in a short period of time. Some areas of Zimbabwe have been experiencing crop losses due to the increased frequency of cyclone induced floods for example Cyclone Idai 2019 and Tropical storm Ana 2022. In field crops, heavy rain may bring with it effects of water logging and leaching.

WATERLOGGING

Waterlogging is excess water in the root zone accompanied by anaerobic conditions.

Waterlogging is Caused by or a combination of excess rainfall, poor external drainage (runoff) or poor internal drainage (water movement in the soil profile (infiltration)). Poor infiltration is prominent in duplex and heavy textured (clayey) soils, particularly when these soils occur on low slopes. The sandy surface of duplex soils enhances water infiltration while the clay subsoil can inhibit drainage within the profile.

Effects of Waterlogging - the excess water inhibits gaseous exchange with the atmosphere, and biological activity uses up available oxygen in the soil air and water resulting anaerobiosis, anoxia or oxygen deficiency. This condition affects field crops in several ways - by creating nutrient deficiencies or toxicities, damage to germination/seedlings, root death or reduced growth consequently poor crop stand and reduced yield. In waterlogged areas nitrogen is lost through leaching, resulting in yellowing of crops.

Uneven crop stand and yellowing of leaves in a waterlogged sorghum and maize field.





SOLUTIONS TO WATERLOGGING

In some areas of Zimbabwe, the recurring wet (La Niña) years often associated with tropical cyclones make implementation of surface drainage measures imperative, these measures include -

1. Storm drains, contour ridging and trenches - Contour ridges are constructed by digging a trench/furrow along the contour and throwing the soil on the downslope side to form ridges to direct the water out of the field. The upslope furrow which accommodates runoff from a catchment strip between the ridges.



2. Soakaways - In the drainage world there are two very important times for a farmer-drainage seasons. The drainage season takes place twice a year, once in the rainy season and secondly around September/October. In the rainy season the farmer works on opening trenches and mapping out a drainage system network then around September/October in the dry season these trenches are deepened to about 1,5m to form soakaways. The bottom of the soakaway is lined with big stones along its length, a second layer of slightly smaller stones and lasty small stones before covering it back with soil. This method can be simplified by using dam liners instead of a series of rocks.

3. Infiltration Pits

- By taking it a step further farmers can incorporate in-field water harvesting techniques to compliment the trenches. Infiltration pits are rectangular trenches excavated at intervals in the



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channels of contour ridges for collecting runoff water, storing it and allowing it to infiltrate and presumably flow through the soil layers. There is wide variability in both recommended and observed infiltration pits dimensions. In this technique of water harvesting the water source is overland flow from the micro-catchment area. Motsi *et al.* (2004) reported that soil moisture and maize yield benefits averaging 2.4 t ha-1 under infiltration pits compared to 1.5 t ha-1 under conventional tillage on sandy loam to sandy soils in Mudzi district in northern Zimbabwe, and Gutu and Chivi districts in southern Zimbabwe.

Hypothetical development of wetting front in contour ridges with infiltration pits. Source - (Nyakudya I.W, 2014).

agronomic practices can significantly reduce nitrogen losses from the system. Appropriate nutrient management protocols can greatly reduce the risk of nitrate leaching loss. These include consideration of fertiliser application rates, method and time. Growing crops need a constant supply of nitrogen nutrition, but this must be balanced with the goal of minimising nitrate losses. This requires an understanding of the plant nitrogen requirement for maximum yield or economic return. For example, is a maize crop needs top dressing fertiliser application of 300kg/ha, one can split the application into three;

1. At 2 weeks apply 100kg AN/ha using the hill placement



method at 10cm away from the stalk.

2. At 5 weeks apply 100kg AN/ ha using the hill placement method at 10cm away from the stalk.

3. At 8 weeks apply 100kg AN/ ha using the hill placement method at 10cm away from the stalk.

A modified regime of fertiliser application gives the crop the best chance to yield according to its full genetic potential even when growing under a lot of rain and placement of fertiliser at different distances facilitates its absorption because as the maize so does do the roots

LEACHING

Nitrogen losses from fields are a function of several environmental and management variables, including soil texture, soil mineralogy, crop type, tillage method, climate and/or irrigation scheduling, and nitrogen fertiliser type, application timing, rate, and placement. Soil type controls nutrient soil solution flux by the degree to which it retains ions (cation exchange capacity) and inhibits fluid



flow, particularly in response to seasonal and pulsed rainfall. Soils such as clays have a higher cation exchange capacity, they tend to have lower leachate loss rates as compared to coarser textured soils such as sands which quicky loose nitrates. The loss of nitrogen leads to yellowing of leaves and consequently yield losses if the crop manages to recover.

Solutions to Leaching - Good Nitrogen Management **Practices**

Enhancing plant nitrogen fertiliser uptake efficiency through

spreading out from the stalk.

It is envisaged that correctly sited drainage systems will lower the risk of crop failure and encourage investments in soil fertility. In order to maximise on return per dollar invest farmers are encouraged to construct storm drains and trenches if there are signs of waterlogging, this can be done with help from Geohydrology technicians.



For more information on rain harvesting techniques

refer to ZiMunda Farming Issue 12 and for knowledge on Good Agricultural Practices follow Mudhumeni Mukuru on twitter, Instagram and Facebook.

References

Nyakudya I.W. 2014. Water management for rainfed maize in semi-arid Zimbabwe. Wageningen: Wageningen University, 2014. 148 p.

K.E. Motsi et al. 2004. Rainwater harvesting for sustainable agriculture in communal lands of Zimbabwe Phys. Chem. Earth.

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Vital Concepts – Creating Spaces for Dialogue

By ZiMunda Farming



Agriculture occupies a central place in Zimbabwe's economy regarding employment, income and poverty reduction. According to the Zimbabwe Agriculture National Policy Framework, there are 1.8 million farmers out of a total population of 14.5 million, which means that 12% of the total population is directly into farming. In light of these statistics, Vital Concepts Investments a publishing company, sought out to play a part in adding value to the agriculture sector in the attainment of the National

Development Strategy by organising the Vital Agro Summit in October 2021 at the Rainbow Towers, Harare.



Agriculture is

specialised knowledge which is held by individuals who might have had special training, farming experience or an apprenticeship. Vital Concepts sought to **promote societal learning** by bringing together different stakeholders across the agricultural sector under one roof by creating space for dialogue. The summit was a facilitated social event based on collective learning processes, democratic participation and empowerment of individuals as well as organisations in the agricultural sector through dialogue.

Under the theme, **Agriculture is a Billion-Dollar Business** - Repositioning Zimbabwe as Africa and The World's Bread Basket, the overall goal of the summit was to discuss topics on how to enhance productivity of the Zimbabwean agriculture in line with the Vision 2030. The event came to life through the sponsorship of C.P. Chemicals (Pvt) Ltd and other companies such as Heritage tobacco, Total Farm Solutions, Country Cool and Gotteshand Investments.

The day was packed with presentation sections from various speakers. Among the speakers was Mr Ivan Craig who spoke on the technical side of cropping systems. In his talk Mr Ivan Craig emphasised on **the role of Good Agronomic Practices (GAPs)** in yield and how they can make local products competent on the international market. He emphasised the importance of investing in planning of operations and soil tests before embarking in any cropping enterprise. Further to this he gave a run through of some GAPs which include plant spacing, using the right chemicals correctly, and correct timing for all operations such as planting and fertiliser application.

Mr T. Mugabe, of Total Farm Solutions gave insights on how to **enhance national horticultural production one hectare at a time** by taking lessons from an inexperienced small-scale farmer who has grown to be commercial by;

- Embracing the power of peer-to-peer engagement to influence



(\$)

AGRIBUSINESS

production.

- Making use of agronomic support.
- Willingness to capture lessons and promote best practises.
- Being consistent.

The keynote speaker at the Agro Summit 2021, Dr Joseph. C. Mushalika, who is a serial Zambian agricultural entrepreneur, awakened the audience to some hard truths on how to individually contribute towards growing a billion-dollar agriculture sector. Through his experiences as the founder of various agro-based companies, he emphasised on the power of learning and adapting any farming enterprise to the environment. Starting with an out-grower model, Dr Joseph engaged rural -based farmers to grow sunflower for a ready market. The fast-growing company was frustrated by a severe drought that destroyed over a thousand-hectare crop of sunflower in the 2014/15 season. With no sunflower to process, Dr Joseph embarked on business training focusing on alternatives to rainfed agriculture. This led to the founding of a new company Victor Series Production- a company focused on uplifting the social and economic well-being of humanity.

Since learning emerges from experience and human

interaction where peoples' differing values, goals and interests are made explicit and where they are brought into negotiating to accommodate conflicts and develop common strategies for action; the 2021 Vital Agro Summit did not only create a space for dialogue it represented an important contribution to national development knowledge. The event gave attendees trans-disciplinary ideas on how to solve agricultural issues and help set the pace in the agricultural development process.

For more information on Vital Concepts, sponsor companies or speakers, contact Tinashe Risinamhodzi the Managing Director of Vital Concepts Investments (Pvt) Ltd on +263 774 008 814 or email vitalconcepts80@gmail.com.





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Peas - Export Crop Production

By Francis B. Mapindani, Seed Co Vegetables Sales Agronomist

As we head into the winter season, peas is one of the most viable horticultural crops that new farmers who are trying to penetrate the export market can start with in Zimbabwe.

The Zimbabwean winter season offers the perfect conditions for production of high-quality peas that are very competitive on the export market against produce from East Africa. With a return per dollar invested of between US\$3-\$4; the crop can give you a high return if farmed correctly.

There are three main types of peas are grown in Zimbabwe and these are the Mangetouts, Sugar snaps and the shelling peas. The Mange tout and Sugar snap peas are the most popular choices for the export market in Zimbabwe but not so much for the local market. The shelling peas on the other hand, are the most popular locally. The Mange tout and Sugar snap peas share a common trait in that they are both harvested before any peas seed has started forming in the pods

THE MANGETOUT PEA



These are characteristically flat podded with harvests taking place before any seed has started forming inside the pods. Varieties with slow seed formation add a great advantage as they lessen pressure on the farmer on the intermittency of harvests in fear of dropping their product quality. Popular varieties amongst local export farmers are Snowwind and Snowgreen which are both available in stock at Seed Co Vegetables. These are stringless, industry standard varieties that produce uniform 9cm pods with an attractive dark green colour. They are both high yielders with expected yields that are north of 7t per hectare.

THE SUGAR SNAP PEA

As compared to the mangetout pea, sugar snap peas have thicker pods. Seed Co vegetables offers Sugarlady and Super Sugar Snap, also known as Sugarlord. This is an extremely P



high yielding indeterminate string variety with average yields of up to 12t per hectare. This variety can grow as high as 2m in height thus, trellising is a must. Sugarlady on the other hand is a determinate variety that grows to a height of up to 75cm with a 7t average yield per hectare. This pea variety produces stringless pods which adds an extra advantage on the export market.

Growing globally approved varieties will ensure that producers will meet global quality standards when incorporated with internationally recognized Good Agriculture Practices (GAPs) overseen by Global G.A.P.

Seed Co Vegetables is a proud supplier of top-quality export varieties and for any enquiries farmers can take advantage of the company's experienced team of Agronomists dispersed all over Zimbabwe. For quick WhatsApp enquiries on seed availability, can get in touch with our Digital Desk on +263 785 883 702 or Francis B. Mapindani Seed Co Vegetables Mashonaland East Sales Agronomist on 0778138897.

GLOBAL GOOD AGRICULTURAL PRACTICES CERTIFICATION

The adoption of the Global Good Agricultural Practices (G.A.P) by players in the horticulture industry can lead to acceptance of local products on the international markets. The Global G.A. P certification in summary is a set of agricultural standards - primarily designed to reassure consumers about how food is produced on the farm. It uses the Integrated Farm Assurance (IFA) Standard which covers the certification of the whole agricultural production process of the product. Control points and compliance criteria are grouped into four scopes; all farm base, crop base, livestock base and aquaculture.

For more information on Global G.A.P refer to ZiMunda Farming Newsletter issue 2 by Vimbai Ruvengo.

The Missing Link in the Local Agricultural Chain

Do you have slow, unreliable, or no connection at all? Zodsat offers you a complete solution.

For those living in the city finding a good internet connection should be fairly easy and yet, for folks living out in rural and remote Zimbabwe it's a different story; there is little to no connectivity due to lack of cellular or broadband connectivity. That





is not to say farmers in these areas should go without connectivity right in their backyard, but rather for them to open up to **VSAT technology.**

As the farming industry is both diversifying and innovating satellite internet is making a dramatic contribution to this. Internet connectivity allows for advancements and a host of other opportunities for farming applications such as providing;

Tools for efficient farming - Modern farming processes rely heavily on data of any kind, from weather patterns to soil nutrients, storage of crop yields and livestock health records. This data should be easy to search and retrieve, therefore it is best to record using tools that are connected to the internet (cloud). **Reliable communication channels** since farmers communicate with peers over messaging applications and social media to confer with others in the same field, stay abreast of pricing information, create business opportunities, and trade crops, livestock and equipment. Necessitated farm security and CCTV systems to prevent theft. Web-based business operations from sales, marketing to finance protocols.

AGRI-TECHNOLOGGY

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Summer Cropping in a Regen Situation By Rob Jarvis

At A.R.T. (Agricultural Research Trust) as you all know we have established a comparative trial to see if regenerative principles applied to a red clay-loam in relatively good heart, can have an impact on soil health and fertility and ultimately on crop output, consequently reducing costs and increasing yield.

Our winter cover crops had good results, with cattle gaining mass at an average of 1.6 kgs a day at peak grazing. Our attempt to establish a spring summer cover crop in between the winter and the rainy season was not so successful and the very dry December meant that we were unable to get full grazing potential out of the land.

Therefore, everything now hinges on the **summer cash crop** to bring in the money before we cycle back into winter cover crops. We tried to plant soyas but the very dry weather in December made this impractical so we opted to grow dry beans with an optimal January planting. Trying to make do with our own planting equipment that is more geared towards traditional tillage seedbed preparation we knew was not going to work. So, we hired a **zero-till planter** from Radzim and have just used this to plant the crop. Just ahead of the promised rains from Tropical Storm Ana which is now with us.

Our trials and tribulations with getting these crops established have led us to work on the principle that we are not dealing with relatively small research blocks but rather that we should imagine that every treatment is a 30-hectare field in a commercial farming situation. So, if you have weeds, thriving on the relatively little rain we received in December, but became torrential in January, then these had to be sprayed with an all-purpose knockdown herbicide like Roundup.

The **Vence Tudo 6040** planter from Brazil is designed to cut through dense mulch and precision plant the seed exactly where you need it in the soil, ensuring good seed/soil contact for germination. The weeds and residual soyas were in the throes of dying from the Roundup. The next week will tell us how successful our operations have been.

But the most promising thing we have seen in the land where cover crops were grown, is the **proliferation of fungi in the soil**, apparent as both mycorhizzal white growths in and around any rooting structures and the appearance of mushroom-like aerial bodies of fungi at the soil surface. There is no doubt that a healthy soil ecosystem is based upon vigorous populations of fungi that proliferate when the summer warm rainy season is here. Go into any miombo woodland in the Zimbabwean Highveld and look at all the fungi that exist in natural conditions. The jury is out on white grub, seen below right, which according to entomologists, feeds only on decaying organic matter.



However, we found **earthworms** in the soil from the blocks that had been grown to winter cover crops, let's hope these continue to thrive in the dry bean summer monoculture and then are able to multiply when we get back into the winter cover crop situation.

We are a long way from making any sort of firm recommendations for farmers in a similar situation to our own, but there definitely seems to be light at the end of the tunnel, the fungi are there, the earthworms are back and the techniques for getting crops established in dense mulch, work if you have the right equipment!



A luta continua!



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The Cotton Wool Disease

By Davidzo Chizhengeni, Animal Scientist

Diseases can cause serious problems on fish farms. They may decimate fish stocks or make a farmer's products unmarketable. Cotton wool disease is one of the most common fish health threats in which farmers loose quite a number of fish to due to high rates of mortality.

Fingerling deaths due to disease.



CAUSATIVE AGENT AND DISEASE

The disease cotton wool disease is caused by water minute organisms (bacteria) mostly in the genus Saprolegnia. Most of the bacteria occurs naturally in the environment. The bacteria are characterised under opportunistic pathogens. In order to infect the fish, they require prior injury of external tissues caused by either mechanical abrasion or other primary pathogens as well as stressful handling.

HOST SPECIES

All freshwater fish species, incubating eggs and other lower aquatic vertebrates/invertebrates worldwide are susceptible to the bacterium.

CLINICAL SIGNS

The mould produces white/brown cotton-like foci on the surface of the skin and/or gills. Early foci are pale with peripheral areas of erythema and central zones of lifted scales that frequently ulcerate, exposing underlying muscle. Systemic infections produce mycelia masses in the gut and viscera causing peritonitis, extensive haemorrhage, necrosis and adhesions. In smaller juvenile fish, external signs of bloating caused by gut obstruction may progress.

White cotton-like foci on the surface of the skin.



TRANSMISSION

External mould infections are transmitted through ambient water by infectious zoospores released from the bacterium. Systemic infections in cultured fish occur by ingestion of uneaten food that has been colonised by mould hyphae. Environmental stress plays an important role in the aetiology of the external disease. Outbreaks occur primarily after minor injury from handling or during crowded conditions when environmental quality is suboptimal.

External mould infections capable of transmission.



Cold water temperatures predispose fish to mould disease because development of zoospores and sexual stages are favoured while host tissue repair and the inflammatory response are slowed by the lower host metabolism. The disease is highly contagious and left untreated will lead to 100 % mortality.

DIAGNOSIS

Diagnosis is based on typical gross clinical signs of white, cottony tufts of hyphae on the skin, gills and other surfaces of infected fish or eggs. Wet mounts of mycelium from lesions.

TREATMENT

The disease is treated with broad spectrum antibiotic in the pond, thus to kill bacterium in the pond. Usually farmers use bacterial stop (potassium permanganate).



KVD consultant treats a fish pond with potassium permanganate. For more information on fish farming contact Davidzo of KVD Livestock Consultancy on 0784458565.

Reference articles on fish farming 1. ZiMunda Farming Issue 9 - Aquaculture at Serepta farm by Andre Hoffman. 2. ZiMunda Farming Issue 9 - The irrigation ditch or pond system by Davidzo Chizhengeni.

3. ZiMunda Farming Issue 14 - Deep green fish pond water.

4. ZiMunda Farming Issue 20 - Supporting Success for Zimbabwe's Fish Farmers by Aquaculture Distributors

5. ZiMunda Farming Issue 25 - Fish Farming an Entrepreneurial Opportunity by Tanaka Calvin Chaza, FarmHut.

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All About Pneumonia in Sheep and Goats

By General Beven Mundida, Livestock Consultant

Question: What causes pneumonia in sheep and goats and how can it be prevented or treated?



Answer: Pneumonia is one of the most common respiratory problems in small ruminants around the world it increases production costs associated with expensive treatments. Although pneumonia often occurs in kids and lambs, illness and deaths also occur in adult sheep and goats.

WHAT CAUSES PNEUMONIA?

Pneumonia occurs when infectious and non-infectious agents cause the lungs of goats and sheep to become inflamed. It is commonly caused by infectious agents - bacteria and virus. Some of the common viruses that cause pneumonia include Parainfluenza virus type 3, and Adenovirus while common bacteria that cause pneumonia include **Pasteurella mycoplasma**, and Chlamydia. Pneumonia caused by bacteria and virus can be acute and highly contagious. Which means that when animals of a flock are affected by this type of pneumonia, the mortality rate is high and those that survive suffer long time effects on their growth and development.

Pneumonia can also be caused by non-infectious agents such as parasites (Lungworms) and aspiration from incorrect drenching. Lungworms **(Muellerius sp)** are acquired when animals graze in pastures infested with the larva of the worm. Snails and slugs are common vectors of this parasite. Young animals are at high risk of getting pneumonia especially when subjected to stress.

Common stresses that predispose sheep and goats to getting pneumonia include

- Overcrowding,
- Animals being kept in poorly ventilated houses,
- Transportation stress,
- Dust and sudden change in climatic weather (common in cold weather) and
- Poor nutrition.

Sheep and goats with pneumonia may be more susceptible to

heat stress which may further exacerbate clinical signs and disease progression for these animals suffering from pneumonia.

CLINICAL SIGNS

Common signs noticed in animals affected with infectious pneumonia include:

- Depression and reduced appetite,
- Rapid shallow breathing which progressively becomes difficult breathing,
- Nasal discharge,
- Fever,
- Prolonged forced coughing in young sheep and goats can sometimes lead to prolapse of rectum,
- Weak lambs and kids can die within twenty-four hours and
- Sometimes animals may die without showing any clinical signs.

DIAGNOSIS

Diagnosis is done based on clinical signs, postmortem and laboratory ex-amination of the samples. It is important to consult with a registered animal health practitioner, any time you notice the above signs.

TREATMENT

The earlier the diagnosing and treatment the higher the chances of avoiding lung damage and death. Those animals that are treated after they already suffer from severe breathing problems may die or take much longer to recover and may not return fully back to normal and often become stunted. Consult your local veterinarian for advice on the best treatment protocol.

Prevention of pneumonia in sheep and goats

• Avoid exposing the animals to stress factors mentioned above.

• Goats should be routinely vaccinated against Mycoplasma (Contagious Caprine Pleuropneumonia).

Do routine deworming to control worms.
Improve

- management practices by providing optimal sanitation and air quality in housing.
- Minimise transportation stress.
- Quarantine new animals before introducing them into the existing herd.
- Keep sick goats in a dry, well-ventilated location away from the rest of the herd.
- Vaccination against pasteurellosis using Multivax P Plus is also necessary as it is more relevant for this part of the world

This article was adopted from the Veterinary handbook for cattle, sheep and goats. For more information on sheep and goats' health contact call/ WhatsApp +263 776 420 161 Email: gbmundida@gmail.com.



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Mastitis in the Dairy Herd.

By James Kabinda, Animal Production Specialist



astitis is a clinical condition whereby a cow ceases to produce milk due to inflammation of the udder. The inflammation of the udder is caused by microbes (mainly bacteria) found on the cow, its udder, the environment, the floor, faeces, soil and water, and parlour machinery. The disease leads to decrease in milk output and an increase in the somatic cell count (SCC) of milk which compromises milk quality.

THE STRUCTURE OF THE UDDER

Understanding the anatomy and physiology of the udder is key to understanding how mastitis develops. The interior of each quarter is composed of a teat cistern, gland cistern, milk ducts and glandular tissue. The glandular tissue or secretory portion contains millions of microscopic sacs called alveoli. Each alveolus is lined with milk-producing epithelial cells and is surrounded by muscle cells that contract and squeeze milk from the alveolus during milking. Blood vessels bring nutrients to each alveolus, where epithelial cells convert them into milk.



HOW MASTITIS DEVELOPS

Mastitis results from exposure of the udder to bacteria. The bacteria pass through the teat duct and multiply in milkproducing tissues. Microorganisms breach the teat duct in several ways. Between milking, microorganisms may pass through the teat duct by multiplying inside the duct, or by physical movement resulting from pressure placed on the teat end as the cow moves about. During machine milking, microorganisms may be impelled into or through the teat duct into the teat cistern. The potential for invasion is greatly increased by bacteria that reside in or colonise the teat duct. Such colonisation occurs in lactating and dry cows, and the colonising bacteria may survive for months, serving as sources of bacteria for infecting the gland. The practice of dipping teats with an effective bactericide before and after each milking greatly reduces teat duct colonization.

SIGNS AND SYMPTOMS OF DIFFERENT FORMS OF MASTITIS

Mastitis can be categorised as follows; peracute, acute, subacute or clinical, subclinical, chronic and gangrenous. All these forms of the diseases differ in the severity of signs and symptoms.

a. Peracute - This form of mastitis is characterised by, swelling of the udder, heat, redness, pain, disturbed function, fever, depression, shivering, loss of appetite and rapid loss of weight.

b. Acute - Symptoms of this form are similar to the abovementioned including fever and mild depression.

c. Subacute or clinical – It is characterised by swollen udder and milk clots.

d. Subclinical – The cow appears normal, without fever, heat

or visually abnormal milk. Milk production decreases by up to 10% and this form can only be detected by tests on milk. **e. Chronic -** With chronic mastitis the inflammation persists from one lactation to another.

f. Gangrenous - This is the most severe form of the disease characterized by necrosis of the udder tissue. The udder turns black and cow is severely ill.

CONTROL AND PREVENTION

Designing a mastitis control program is pivotal in any dairy production system. The control program must be practical, easy to understand, highly effective in most dairy herds, increase economic returns, reduce new infections, shorten duration of existing infections, provide tangible evidence that clinical mastitis is reduced and be easy to modify in case of new development.

Management Task	Specific action		
Milking hygiene	Milk teats that are both clean and dry		
Milking machine	Stabilize milking vacuum before removal		
Post milking teat dipping	Immediately after removing cups. Immerse teat in iodine at least ½ of the teat.		
Pre milking teat dipping	Before inserting cups on the teats. Immerse teat in iodine at least % of the teat.		
Drying off	All quarters of the udders of all cows after last milking.		
Treatment of clinical cases	Early detection and treatment, maintain records.		
Culling	Cull chronic cases.		
Environment	Clean and dry, uncrowded and well ventilated.		
Herd replacements	Test new animals before adding to the herd. Check new animals regularly.		

TREATMENT OF MASTITIS

Treatment can be done by antibiotic therapy for clinical cases. Subclinical cases must be controlled through correct management practices. Antibiotics that can be used include; Cloxacillin, Streptomycin and Penicillin. Cloxacillin is the only drug with no known resistances. Infected animals must be sampled and tested for specific type of the causative pathogens.

Drug application - First milk out into a bucket, followed by intra-mammary dosage of antibiotic as recommended by the drug manufacturer. If the cow fails to respond well within 2 days, change drug. Acute and peracute cases nurses along with treatment. Consult a vet in your area for proper drug administrations.

Mastitis remains a complex disease and its management is an increasing challenge when many studies have been made in an attempt to describe fully the extent and nature of this problem. It is pivotal for industry role players to impart knowledge to rural cattle holders such that they are equipped with the tools to prevent or manage the disease. Prevention is always cost effective than treatment.

James Kabinda is an Animal Production Specialists with a degree in Animal Production and Technology from Chinhoyi University of Technology. For more information call 0774225873, or email: jameskabinda@gmail.com For more information on Mastitis in Dairy Cattle refer to an article by Eunah Makoni, MSC, MBA. ABS TCM (Pvt) Ltd on ZiMunda Farming Issue 14.



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TULI – The story behind the Jambo Tuli, ZiMunda Farming Issue 4 (print version). The Tuli Breed- Born and Bred in Zimbabwe, ZiMunda Farming Issue 23

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