

# Ticks in South Africa are becoming resistant to pesticides and may become uncontrollable

By Luther van der Mescht

**T**ICKS that suck the blood of South Africa's cattle are developing resistance to the only pesticides that kill them and have become increasingly difficult to control. If not contained, the spread and resistance to pesticides of these small parasites will affect farmers' incomes and could reduce the country's meat and milk production.

South Africa has approximately 12.2 million cattle. The ticks that live on cattle carry pathogens that can cause deadly diseases like anaplasmosis (which causes fever and anaemia) and babesiosis (which causes fever and progressive anaemia).

The potential impact of ticks on South African



Ticks that live on South African livestock are becoming resistant to the only pesticides that can kill them.

transfer their genes to the next generation.

We found that acaricide resistance was highly variable across South Africa, probably because of different farm management practices. Therefore, this needs constant monitoring at a local level for us to understand the scale of the problem and prevent mass tick resistance.

If ticks continue to build their resistance to acaricides, this will affect farmers' incomes and could lead to lower meat and milk production.

How ticks breed

The pesticides that kill ticks are known as acaricides. There are currently only three main acaricides (chemical classes) used in South Africa.

When a cow is infested with ticks, most of these pests will be killed when the cow is dipped in acaricide. However, some ticks survive the dip, reproduce and pass their acaricide-resistant genes onto their offspring. This will eventually result in generations of ticks that are completely resistant.

Male ticks typically mate with a few female ticks on a cow. The female ticks then drop off, lay thousands of eggs and die. The eggs hatch within three to six weeks and a new generation (larvae) is born. Ticks that are fully resistant to acaricides can emerge within as little as two years after the introduction of a new acaricide.

The additional problem is the long time it takes to develop new acaricides. It takes approximately eight to ten years and millions of dollars to clinically test and register new products.

Why ticks are becoming resistant

Poor farm management decisions such as underdosing, overdosing and dosing too frequently with acaricides drive the development of resistance. Underdosing leaves more survivors who have resistant genes. Overdosing or dosing too frequently kills most ticks but the few that survive will transfer their genes to the next generation.

Cattle in communal systems that move around freely, and cross borders, transport resistant ticks to other populations where they

mate and spread acaricide-resistant genes further.

Making the situation even worse is that ticks that breed faster, such as the invasive Asian blue tick, develop resistance much faster than, for example, the endemic brown ear tick.

South Africa also has certain cattle breeds that are naturally less resistant to ticks. They can sustain larger tick populations and therefore contribute more to the problem.

A further problem is that anti-tick vaccines are not yet commercially available in Africa. This is mainly due to limited research and development, especially on the kind of vaccines needed for African tick species.

How to solve the problem

Livestock inevitably develops resistance to acaricides. But this usually happens over a much longer period, if pesticides are used correctly. There are a number of actions that can be taken to slow resistance down:

Livestock should be quarantined when moved to a new farm to prevent the spread of resistant ticks.

The number of acaricide treatments for each animal must be kept to a minimum so that ticks do not have as many opportunities to develop resistance.

Tick resistance to acaricides must be monitored. Identifying ticks and characterising their resistance profiles in specialised laboratories could be used to make informed decisions regarding acaricide use which can mitigate resistance. Once this baseline is established, resistance should be monitored continuously.

Government veterinary services should create awareness of acaricide resistance and support especially under-resourced producers. Acaricide resistance testing laboratories should be established by the government to monitor and advise farmers. No support is currently being provided to farmers by the authorities.

Acaricides that have different ways of killing ticks must be rotated so that ticks don't build up resistance.

Ticks can also be killed by plant extracts. These are popular in developing countries because they are cheaper than synthetic acaricides. However, they are not as effective. Combining botanical extracts and synthetic acaricides could be a solution, but this has not been fully explored yet.

can agriculture is magnified by the sector's peculiar circumstances. South Africa's farming community consists of two agricultures: a large number of subsistence farmers with limited resources and a smaller number of commercial farmers. The country also has a large number of tick species and a diverse landscape (habitat and climate) in which ticks can breed and cattle can be farmed. Warm, humid conditions normally lead to faster tick development, which could result in quicker resistance development.

As a result of these factors, the impact of ticks and tick-borne diseases in South Africa can be more severe than in developed countries.

I research parasites like ticks and set out to investigate acaricide resistance in the invasive Asian blue tick, which is considered one of the most successful cattle ticks in the world, yet its resistance status was uncertain in South Africa. The goal was to determine the resistance status and link this with current and past acaricide use.

The study found that a large number of tick populations have become resistant to at least two of the three main acaricide types (chemical classes) used in South Africa. The reasons for the growing resistance may include poor farm management practices such as underdosing, overdosing and dosing too frequently with acaricides. Underdosing leaves more resistant survivors. Overdosing or dosing too frequently kills most ticks but the few that survive will become "super-resistant" and



REVOLUTIONARY GOVERNMENT OF ZANZIBAR  
PRESIDENT'S OFFICE FINANCE AND PLANNING

INSTITUTIONAL SUPPORT PROJECT FOR DOMESTIC RESOURCE MOBILIZATION  
AND NATURAL RESOURCE GOVERNANCE  
(ISP-DRM-NRG)

REQUEST FOR EXPRESSION OF INTEREST (EOI)  
EOI NO: ISP-DRM-NRG/ZNZ/AfDB /QCBS/01/2024

1. Consultancy Services for Legislative drafting of Zanzibar Mining Law and its Regulations (ISPG/DRMNRG/ZNZ/AfDB/QCBS/01/2021)
2. Consultancy Services for the Draft Bill of Zanzibar Petroleum Income Taxation and Additional Profit Tax (ISPG/DRMNRG/ZNZ/AfDB/QCBS/03/2021)

Financing Agreement reference: 2100150037346

Project ID No.: P-TZ-KFO-006

Date: 26th July, 2024

1. The Government of United Republic of Tanzania has received financing from the African Development Bank toward the cost of the Institutional Support Project for Domestic Resource Mobilization and Natural Resource Governance (ISP-DRM-NRG). The President's Office Finance and Planning- Zanzibar, an implementing agency of the Client, intends to apply part of the agreed amount for this loan to eligible payments under the following contracts for which this Request for Expression of Interest (EOI) is issued:

2. The objective of the assignment includes services but not limited to the following;

- i. Consultancy Services for Legislative drafting of Zanzibar Mining Law and its Regulations

The objective of this assignment is to provide consultancy service for legislative drafting of Zanzibar mining law and its regulations that fit the Mining sector for Zanzibar's unique context.

The duration for the implementation of this assignment is Five (5) months

- ii. Consultancy Services for the Draft Bill of Zanzibar Petroleum Income Taxation and Additional Profit Tax

The objective of this assignment is to provide legislative drafting of Zanzibar Petroleum Income Taxation Act and Additional Profit Tax Act.

The duration for the implementation of this assignment is Five (5) months.

3. The President's Office Finance and Planning-Zanzibar now invites eligible consultants to indicate their interest in providing these services. Interested consultants must provide information indicating that they are qualified to perform the services (brochures, description of similar assignments, experience in similar conditions, availability of appropriate skills among staff, etc.). Consultants may constitute joint-ventures to enhance their chances of qualification.
4. Eligibility criteria, establishment of the short-list and the selection procedure shall be in accordance with the African Development Bank's Procurement Policy for Bank Group Funded Operations, October 2015, which is available on the Bank's website at <http://www.afdb.org>.
5. Interested consultants may obtain further information at the address below during office hours between 9:00 and 15:00 hours from Monday to Friday except on Public Holidays.

Tel: +255 777 468 886/+255 773 393 689

E-mail: [caliphansaid@yahoo.com](mailto:caliphansaid@yahoo.com)/[ridhakhamis@gmail.com](mailto:ridhakhamis@gmail.com)

6. Expressions of interest must be delivered to the address below by hand or courier by 15th August, 2024 at 10:00 hours and mentioned on the envelope, Expression of Interest Number and Name of the selected assignment, as mentioned above.

Attn: Project Coordinator ISP-DRMNRG,  
President's Office Finance and Planning  
ISP-DRM-NRG PCU Office,  
12Keneth Kaunda Road,  
71402 Urban West,  
P.O.BOX 1154,  
VUGA STREET  
ZANZIBAR

  
Aboud H. Mwinyi

/PRINCIPAL SECRETARY,  
PRESIDENT'S OFFICE FINANCE AND PLANNING  
P.O.BOX 1154,  
VUGA STREET  
ZANZIBAR



A cow infested by the brown ear tick.