Opskrif: Tanniene se rol in herkouervoeding

Vraag: Ek sien dat baie van die blaarvreters vir 'n rukkie by 'n boom vreet waarna hulle padgee na 'n ander boom. Wat is die rede hiervoor?

Antwoord:
Plante produseer tanniene om huself te beskerm. Hierdie artikel gee 'n oorsig oor navorsing wat gedoen is veral oor die ekonomiese implikasies wat dit vir wildboerdery inhou.

TANNINS: A REVIEW

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The production of tannins as a defence mechanism by plants , has been researched and proven. It is only during the past 20 – 30 years that the true economic impact on game has become evident as more and more game farms are fenced off.

The purpose of this review , is to state facts from research and explain why animals die from tannin poisoning as well as to suggest certain measures which can reduce the effects of tannin toxicity on game farms.

Different types of tannins are produced and effect animals differently:

Condensed Tannins (Proanthocyanidins)
This is the most commonly found tannin. This group causes enzyme inhibition, protein precipitation and hence nutritional deficiency. Lesions of the gut mucosa, affect absorbtion. High concentrations in foilage, leads to reduced intakes, due to the astringent taste effects. Astringency is due to the binding of the tannins with salivery glycoproteins. Visible effects on the animal, relates mainly to protein malabsorbtion – hence emaciation.

Hydrolyzable Tannins:
Rumen degradation of hydrolyzable tannins, results in the production of pyrogallol, a hepato - and nephrotoxin. Acute deaths can be attributed to this toxicity. Major lesions at necropsy include haemorrhagic gastroenteritis, liver necrosis and proximal tubular necrosis in the kidney .

Depending on the type of tannin dominating, one can either find emaciated weak animals dying from protein malnutrition, or animals in good condition dying acutely .

How do animals cope with tannins in nature?

- Browsers produce proline-rich glycoproteins in the saliva. The main contents of the saliva: small glycoprotein containing large amounts of proline, glycine and glutamate / glutamine. The main purpose of these substances, is to form complexes with the tannins, binding with them and prohibiting the tannins from further action in the rest of the GIT. Browsers also have more nitrogen in their saliva due to recycling.

  These substances are absent from grazer saliva , hence the severe impact of tannins on grazers.

Research in moose from North America and Scandinavia has proven that even in the same species, there is a marked difference in the binding of tannins in saliva. This difference was dependent on the species of trees browsed on.
(A point to consider when re-locating browsers to vastly different habitat.)

- Rumen adaptability to digest tanniferous browse:
  Several studies have proven that, giraffe, greater kudu, eland, duiker, impala and nyala do not posses any rumen microbes that can digest or inactivate tannins. On the contrary, the addition of polyethylene glycol (the main active ingredient of Browse Plus *) increased digestibility and nitrogen production in above species.

TANNIN DYNAMICS IN BROWSED PLANTS

Tannin producing plants have several ways in which the tannin levels fluctuate:

- Fluctuation between different areas in the canopy spread.

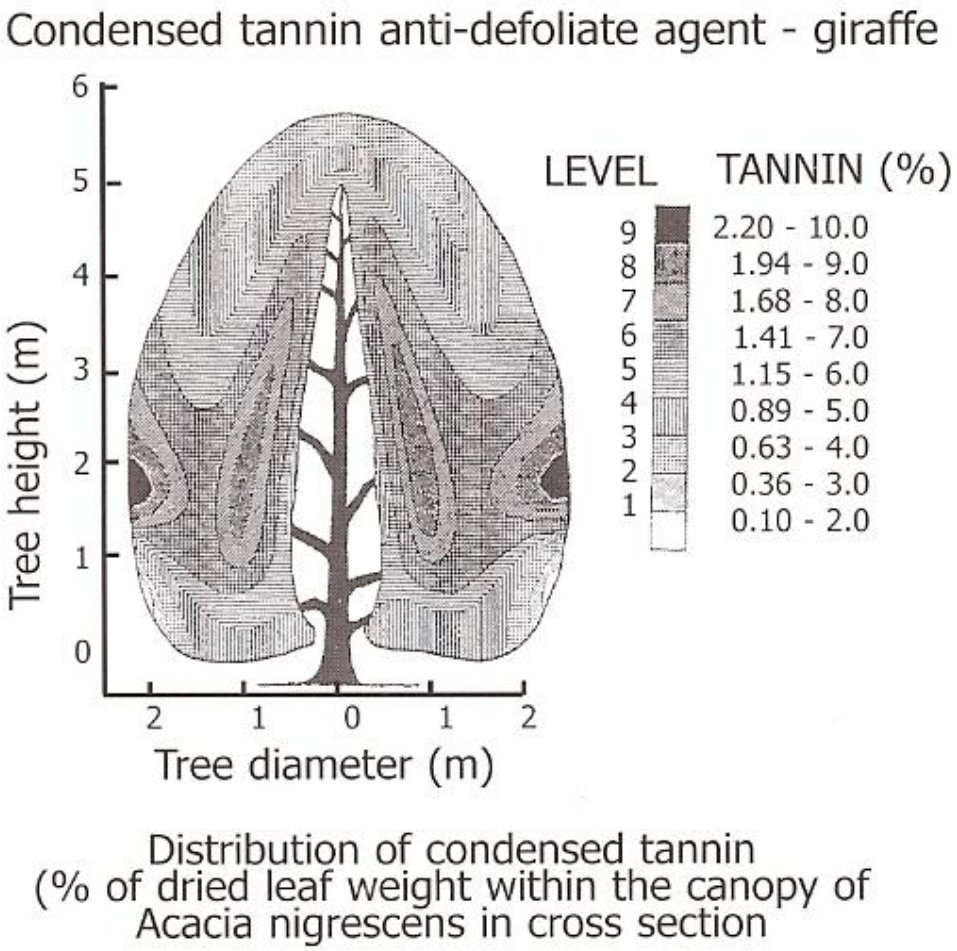

Figure 1 (Furstenburg & Van Hoven)

- Fluctuation between different areas of sunlight exposure. Tannin levels are higher in the shaded area.

- Daily, cyclic fluctuation. Tannin levels decreases with increasing temperature during the day and increases with decreasing temperature through the night.

- Fluctuation between different phenological leaf stages in the same tree.Young and premature leaves contained twice as much condensed tannin than mature leaves.

- Change in leaf tannin levels in reaction to browsing. Most browsers, browse selectively, selecting plants which contain < 5% (dried leaf mass) condensed tannin. Increase in tannins after browsing commensed, starts within 2- 10 minutes (hence animals move from tree to tree, never browsing one tree totally). Recovery to predisturbed levels takes 40-66 hours. (This explains why browsers even if they keep to a single area, rarely are to be found at the exact same location day after day as is the case with many grazers.)

DISCUSSION:

Game ranch dynamics

During the drought period of 1981-1986, a significant amount of kudu died in the now Limpopo province. Dr Van Hoven did research on the mortalities and found two related parameters, namely:

- **Number of kudu/100ha**

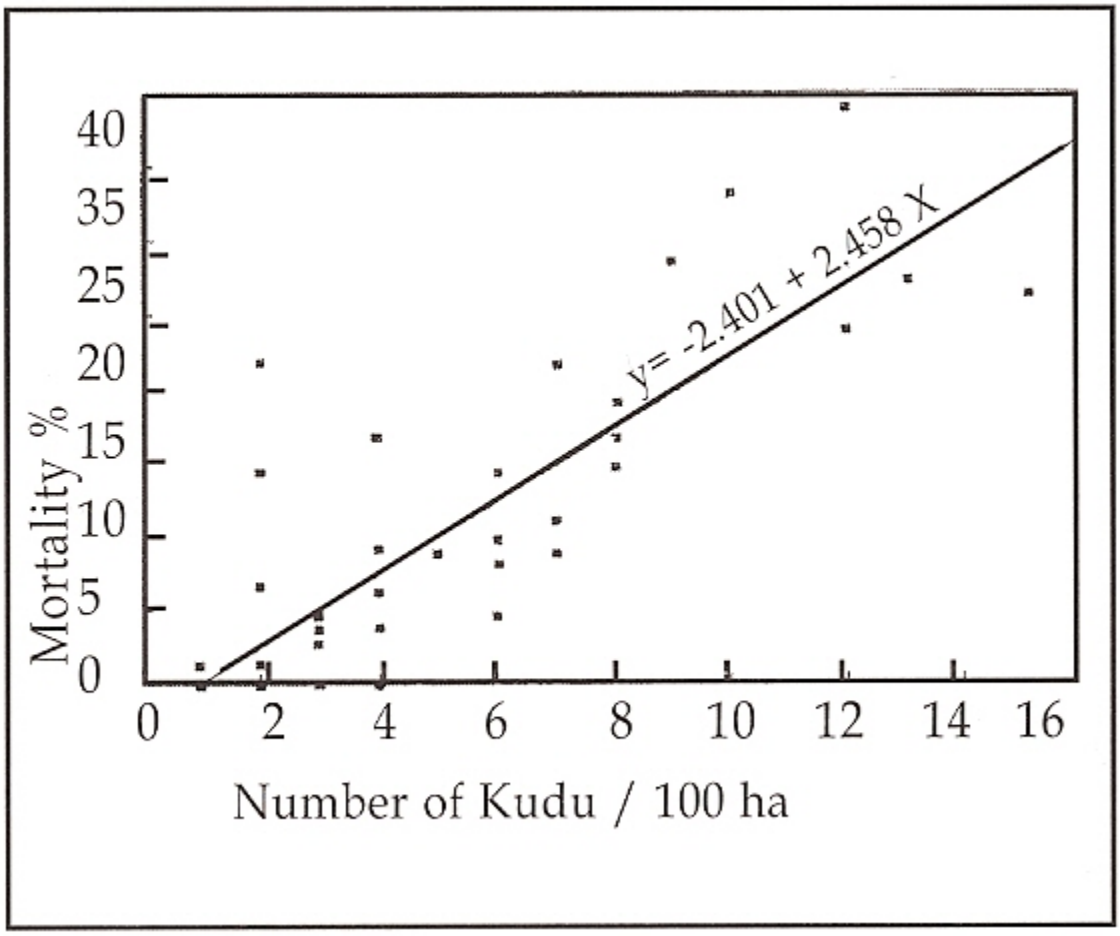

Figure 2 (Van Hoven)

- **Condensed tannin content of the major species browsed**

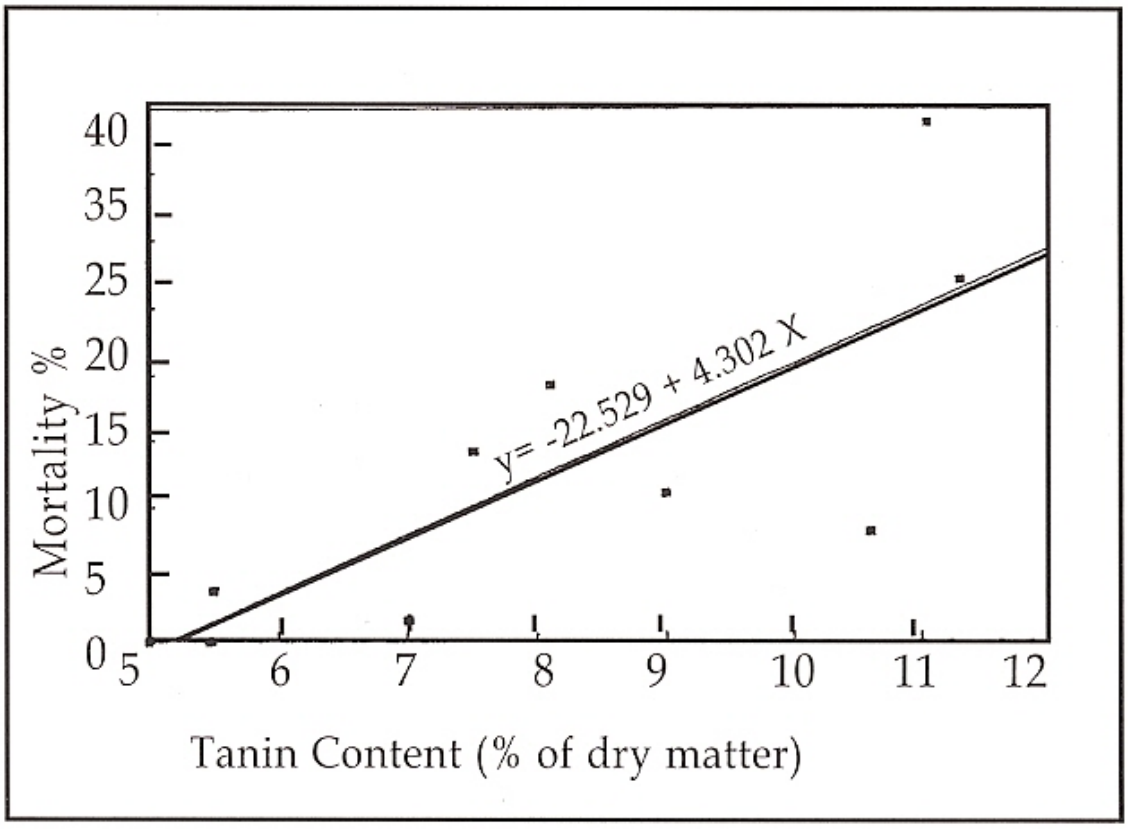

Figure 3 (Van Hoven)

It is clear that by concentrating browsers and forcing them to constantly browse the same plants, the threshold of salivary tannin binding is exceeded and either acute deaths or chronic

emaciation will occur. (As game ranchers and consultants to game ranchers we must take into account that although browsers have adapted by secreting saliva rich in proteins able to bind tannins, selecting plants with lower tannin levels and by browsing on the move, by fencing in animals, we have artificially disturbed the balance.)

There are basically only two practical ways of dealing with tannin related problems:

- Decrease the stocking rate of browsers (within species and also among species)
- Supply polyethylene glycol (Browse Plusk) via drinking water , in order to bind tannins and prevent tannin related toxicity.

For more information on the use of Browse Plus, contact Virbac Animal Health on 012 –657 6000.

Products :
*BROWSE PLUS (V 11013 Act 36 /1947)
Polyethylene glycol 930g/kg
Exipients 70g/kg

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