Sustainable Mohair Industry Production Guidelines:

**Pre-Farm Gate**

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Foreword

The world is faced with desperate challenges to overcome the effects of climate change. In support of this, a new look at the measures of sustainability with on-farm production systems is necessary to install confidence in the broader consumer markets wanting to know that products were produced in systems where the natural resources are not depleted and wasted. These guidelines demonstrate such best practices for economical, environmental, animal care and social accountability and are supported by a voluntary self-assessment model that allows producers to assess their farming practices.

The main drive is for Mohair producers to be committed to a continuous plan to improve their practices and to be in a position to demonstrate that they are actively working at moving in the right direction. Linked to this is a drive to develop low cost technologies that will enable producers to make progress in the right direction. I would like to thank Mohair producers and the various institutions that enthusiastically contributed to the development of the guidelines and self-assessment checklist.

These guidelines will contribute to a more profitable and sustainable Mohair industry.

Gerhard Grobler
President: South African Mohair Growers Association
This document has been aligned with industry relevant standards such as Mohair SA standards, several certification systems (organic; EU; Global GAP) as well as the generic Well-Managed Farm Guideline (a GreenChoice project produced as a partnership between the World Wide Fund for Nature and Conservation International) and has been developed in a multi-stakeholder process.
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Preface

South Africa produces ± 56% of the world’s Mohair and Mohair South Africa (SA) assumes a leading role in the development of the global industry. The industry aims to expand still further. However there are serious concerns around the sustainability of this proposed expansion as goat grazing has led to over 90% transformation of some thicket types within the Subtropical thicket vegetation, and much of this transformation is irreversible without intervention24. If the Mohair industry is to be sustainable, this and other agricultural and biodiversity resources must be conserved and where possible, restored. The existence of global change simply adds to the imperative of sustainable agriculture use. The purpose of this document is to describe sustainable good practice standards to serve as a foundation for audit and certification systems of Mohair producers, brokers, processors and manufacturers. Suggestions are made regarding the involvement of producers in participatory action research to help conserve our agricultural resources. The guideline will be regularly updated to reflect ongoing research.

Compliance with integrated, industry standards will add to the credibility of the South African Mohair industry as world leader in ethical and sustainable Mohair production.

Introduction

Mohair production in South Africa is largely extensive in nature, with many production landscapes being rich in plant and wildlife. As a result the Mohair industry has considerable potential as custodians or stewards of these landscapes, both in terms of the agricultural resource (vegetation, soil and water) as well as biodiversity assets. Indeed Mohair producers have expressed the need for a production and market integrated approach that differentiates the Mohair industry as a sustainable, biodiversity-friendly, clean and ethically compliant industry. This is in line with changing national and international markets where sustainability is increasingly a requirement for market access.

As a result, these guidelines comply not only with social and environmental legislation but also recognize the present unsustainable rate of transformation of Suptropical thicket, the vegetation upon which the Mohair industry largely depends. In addition, these guidelines take climate change and energy sources into account.

Mohair is mainly produced in the south-eastern and western regions of South Africa. This is an area of ca. 9.8 million ha and represents no less than 6 biomes (AGIS, 2008). Albany thicket, Succulent Karoo, Grassveld and Nama Karoo can be regarded as the most important of these. The main Mohair producing region in South Africa (Fig. 1) can be described as being unique with a huge diversity of plant and wildlife. Large game, e.g. kudu, are ubiquitous in this region and protected predators such as leopard roam the Southern mountainous regions. Farmers are also confronted with predators, e.g. jackal and caracal, which are ideally managed in a non-lethal manner.

The following on-farm principles are addressed in this document:  

1. Economic  
2. Environmental  
3. Animal-wellbeing  
4. Social

Each of these principles is expanded into various criteria and indicators. It is intended that this guideline ease the path of producers on their journey towards good agricultural practice, while enabling producers to prepare for third party audits should they choose to certify their products. Independent industry assessments or certification has become the norm with the application of track and trace models like ‘Historic Futures’, which trace products from production to retail level. The guide will likely also enhance communication between various sectors within the industry.

The guideline text provides background information on the principles, criteria and indicators while the self assessment checklists (App. 1) incorporate all the principles of the main text by listing the suggested indicators, thus enabling a quick self-audit of compliance. Where applicable, reference is made to organic production indicators. In all sections of this document, Mohair producers must comply with the relevant legislation referred to in this document. The checklist is designed in such a way that complying with legislation does not earn high points but non-compliance excludes any kind of status rating, as would be the case for third party certification.

This document has been aligned with industry relevant standards such as Mohair SA standards, several certification systems (organic; EU; Global GAP) as well as the generic Well-Managed Farm Guideline23 (a GreenChoice project produced as a partnership between the World Wide Fund for Nature and Conservation International) and has been developed with the support of the following institutions:

- The Mohair Growers Association of South Africa
- Mohair SA
- The National Woolgrowers Association of South Africa
- The National Department of Agriculture – Grootfontein
- The National Department of Agriculture – Pretoria
- Eisenburg - Provincial Department of Agriculture
- Eccocert
- The Livestock Health and Production Group of the South African Veterinary Association
- Cape Nature
- Conservation International (via the GreenChoice Alliance project)
- World Wide Fund for Nature (via the GreenChoice Alliance project)
- The Biodiversity and Wine Initiative
- Endangered Wildlife Trust
- The NSPCA
- Woolworths
- Eduplan

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Mr. Arthur Short - Mohair Grower

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Fig. 1 Biomes in the Mohair production region of South Africa. For a detailed vegetation map as defined in the STEP (Subtropical Thicket Ecosystem Project) go to http://bgis.sanbi.org/step/vegetation.asp.
1. **The economic principle**

The economic principle is that an economically viable farm production is maintained or enhanced. This can be expanded into one criterion, namely that the agronomic, livestock, veld and forage resources and practices of the farm are integrated with the climate, soils, water and topography to maintain or enhance sustained economic return to the producer. Criteria within this principle were drawn from various sources and can be expanded as:

1.1 **A written land use plan exists**

The farmland should be mapped and environmental risk factors identified. Climate change should be recognized and strategies for mitigation and adaptation should be developed and implemented.

1.2 **Profitability of the farming operation is planned annually**

To be economically sustainable it is necessary that a farm vision, farm land use plan, marketing strategy and accompanying financial plan is developed and annually revised. Production information and records of production, losses, assets and liabilities, as well as income and expense must be recorded annually. Financial year records must be kept to calculate the value of short- and long-term production decisions, also in relation to other farming activities on the land. This will enable continuous improvement and active management of the farm.

1.3 **Production potential of the land is maintained and ecosystems are protected**

A sustainable business is dependent on sustainable land use. If ecosystem services are maintained (see The Environmental Principle) then there is a possibility of Payment for Ecosystem Services (PES) by government, e.g. DWAF Drakensberg water catchment project). Also, tax incentives are offered to farmers entering into stewardship agreements.

1.4 **A climate change strategy is in place**

The effects of climate change are recognized (e.g. reduced or increasingly erratic rainfall) and where possible a strategy to mitigate or adapt is formed. Where SA producers can show their soil carbon percentages have increased, a future potential exists for economic returns from carbon trading. Another potential economic return exists in reduced insurance premiums for producers that have made efforts to adapt to climate change (e.g. restoration of a wetland area, which acts as a buffer against both flood and drought events).

1.5 **An energy strategy is in place**

Energy efficiency and reduction in green house gas emissions is practiced by e.g. employing renewable energy resources (solar, wind).
2. The environmental principle

Society derives many essential goods and critical, life-supporting services from ecosystems.

In an extensive livestock industry such as Mohair production, proper management of the agricultural resource (soil, water and veld) will contribute to maintenance of biological diversity, ecosystem functioning and thus, ecosystem goods and services. If conducted properly, livestock production is often the most appropriate land use for range and grasslands.

However, there are serious concerns regarding the grazing of goats in the Suptropical thicket, as goat grazing has led to extensive transformation of this vegetation. While restoration of thicket has been undertaken by some producers, others remain unaware of the unsustainability of converting an intact, closed canopy succulent thicket into a so-called pseudo-savanna, where only a few remnant trees remain. Producers may even consider this pseudo-savanna better for production, being unaware that this state of the vegetation is unstable and merely represents an intermediate stage in a trajectory towards a highly desertified state where only the ephemeral grasses and forbs persist\(^2\). Producers are urged to restore succulent thicket where possible and to become involved in participatory action research (see text box)

In addition, these guidelines aim to promote setting aside of conservation areas with producers ideally belonging to a stewardship program so that fauna and flora are protected into perpetuity. Besides the protection of critical ecosystems, appropriate fire, soil, water, alien plant eradication, reduced waste, reduced fertilizers will protect the biological and agricultural resources alike.

Thus, the environmental principle is that (i) agricultural and biodiversity resources are protected/sustainably used, (ii) critical ecosystem services and ecological processes are maintained and (iii) natural assets are conserved. Criteria within this principle were drawn from various sources\(^1, 2, 3, 8, 14\) and can be expanded as:

2.1 Agricultural and biodiversity resources are protected/sustainably used

Section 29 of the Conservation of Agricultural Resources Act Act 43 of 1983 (CARA) allows the Minister to publish certain regulations that achieve the objectives of the Act, viz. to provide for the conservation of the natural agricultural resources by the maintenance of the production potential of the land, by the combating and prevention of erosion and the destruction of the water resources, and by the protection of the vegetation and the combating of weeds and invader plants. Regulations have been published (GN R1048 GG 10029 of 25 May 1984 as amended – GN R280 GG 22166 of 30 March 2001).

2.1.1 A written land use plan exists

A land use plan should identify erodible soils, waterways, vegetation type, alien plant infestations, topography and farmed and conserved areas. Different soils have different erodibility potential and can be categorised accordingly (well-structured soils with a high clay content tend to be more resistant to erosion than sandy non-structured soils). Usually the land use plan would comprise a map and depending on the scale of operation, this would be supported by text.

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**Ecosystem goods and services**

**Goods:**
- Fodder and fuelwood
- Wildflower harvesting
- Honey
- Ecotourism, see www.grootbosfoundation.org.za

**Services:**
- Water purification
- Mitigation of floods
- Soil nutrient cycling
- Soil carbon storage
- Sand movement
- Soil replacement
- Pollination of crops by birds, insects and mammals
- Control of pests

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**Participatory Action Research**

Your help is needed to develop better management guidelines for Subtropical thicket.

Contact: HJ Hawkins
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2.1.2 Soil health is maintained or, where necessary, improved
The CARA legislation aims to ensure that soil health is maintained or improved through appropriate agricultural practices. Soil health is a concept that embraces the chemical, physical and biological functioning of soils (Lanz, 2009), a proxy of which is soil carbon. Farming practices that may result in increased carbon include (after Leu, 2007): Minimum and mulch tillage, use of nitrogen sources with a carbon source such as composites, animal manures, green manures and legumes; reduced use of biocides that affect beneficial micro-organisms that build humus; suppress diseases and make nutrients available to plants.

However, the first step towards maintaining soil health is to minimize soil erosion and this is the only soil parameter that can be reasonably legislated, most of which apply to cultivated land. Most Mohair production in SA is extensive and these measures are explained elsewhere. Soil erosion may however be influenced by infrastructure on-farm: Heavy machinery, should be avoided when conditions are wet as compaction can occur, breaking down the soil structure; roads must be sited, constructed and maintained to minimise soil loss. Routes should be selected to avoid sensitive areas such as indigenous forests, special natural plant communities, breeding sites, wetlands, archaeological or historical sites and other natural assets. Construction of river crossings should not result in concentration of the flow of the water in the river, and roads should not interrupt the hydraulic flow of a wetland. Roads should cross watercourses at right angles and the approach and departure verges should be grassed. All rock must be adequately drained, and the drains either grassed or paved. The correct number of drains must be constructed to meet the slope requirements of the road. Road culverts and farm bridges should accommodate 1:10 year flood or 1:20 year flood (primary road). Should a bridge, culvert or road affect the watercourse in terms of section 21(c) and 21(i) of the National Water Act, it may be necessary to apply for a water use licence. However, there is a provision under the General Authorisations which may ease the need for licensing under certain conditions (GN 26187 GG 398 and 399 of 26 March 2004, www.dwaf.gov.za).

2.1.3 Water resources on the farm are managed to conserve water and water use is legal
The National Water Act 36 of 1998 (NWA) is the primary legislation regulating water use in South Africa and recognizes that we need to use our water supplies efficiently and effectively. Producers should determine which categories of water use (as listed in section 21 of the Act) are applicable to their farming enterprise (www.dwaf.gov.za). Tools to use water sustainably include indicating waterways and sources on the land use plan, removal of infestations of invasive alien plants, monitoring of groundwater levels, monitoring of soil moisture contents, effective irrigation, dam construction, inter-basin transfers to bring water from areas of surplus to areas experiencing shortages as well as water trading and relocation of water use by compulsory licensing.

Irrigation uses ca. 56% of all our water but is minimal in livestock production and is not dealt with here. Extensive livestock production, like dryland agriculture does not need authorisation as a water use and is not, at present, controlled under the NWA.

The following is recommended:
- Sufficient veld cover must be maintained to retain moisture and to prevent erosion.
- Water resources must be sustainable and sufficient for farming requirements. Where necessary, water should be tested for quality and supply should be monitored.
- The quality of water must be sufficient for animal use.
- Windmills should be provided with automatic breaks to conserve water when dams are full.
- Contamination of water sources must be prevented and special care should be taken to limit or prevent harmful effluent.

2.1.3.1 Wetland and water course protection
Wetlands are defined in the NWA as “land that is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which or would under normal circumstances support vegetation adapted to a life saturated in soil”. Wetlands, vleis, marshes, water sponges and water courses are protected in terms Regulation 7 of CARA and the NWA:
- Utilisation of vegetation in a wetland (vlei, marsh or water sponge) must not damage the agricultural resources (defined as the soil, the water sources and the vegetation, but excluding weeds and invader plants).
- Utilisation of vegetation within the flood area of a water course or within 10 meters horizontally outside the flood area must not damage the agricultural resources.
- No cultivation or drainage of wetland, including land within the flood area or within 10m horizontally outside the flood area of a water course is permitted, unless authorised by the executive officer of the appropriate agricultural department, unless activities took place prior to 1 June 1984. However, land must still be protected against excessive soil loss due to erosion through the action of water.

2.1.3.2 Wetland Management
DWAF have published a guide to the identification of wetlands using soils, vegetation and position in the landscape obtainable at www.dwaf.gov.za. Wetland soils can be defined as an area that is flooded for a sufficiently long period for waterlogging to become the dominant factor determining the diagnostic characteristics of the soil, with the presence of mottling or gleyed horizons due to the anaerobic conditions.

Farmers should identify wetlands and watercourses, map them and protect or rehabilitate as appropriate. Thus wetlands should
not be planted to crops, alien invader plants should be removed, and burning and grazing should be controlled. The Mondi Wetland Project is a valuable reference point for guidelines to protect and rehabilitate wetlands (www.wetlands.org.za/manage.html). Rehabilitation of wetlands will shortly appear under a General Authorisation which will have the effect of replacing the need for a water user to apply for a licence when undertaking such rehabilitation. However, a basic assessment in terms of proposed EIA regulations is likely to be required for the reclamation of a wetland in due course (GG No. 31885 Vol. 524 of 13 February 2009).

2.1.3.3 Riparian zone management

The presence of riverine, fringing woody plants or reeds, bulrushes, sedges and hygrophilous grasses are clear indications of the presence of a watercourse that should not be planted to crops to within 10m (CARA, Regulation 7). Indigenous vegetation along water courses should not be removed, and where it has been removed the re-establishment of suitable indigenous plants should be considered.

2.1.3.4 Regulations of flow pattern of water

The flow pattern of runoff water is regulated by Regulation 8 of CARA:

- No run-off water from a water course may be diverted to another water course, unless authorised by the Department of Agriculture, or National Environmental Management Act (NEMA) with approval by the Department of Water Affairs and Forestry (DWAF).
- The natural flow patterns of water on a farm may not be disturbed by obstructions, unless this obstruction will not cause excessive soil loss.
- Existing obstructions of the natural flow pattern of run-off water may not be removed or altered if this would result in excessive soil loss.

2.1.3.5 Storage of water

Storage of more that 10000m³ per farm may require registration of the dam or storage with DWAF. Dam safety requirements as specified in NWA, including routine inspections, must be complied with. Any dam with a wall height of less than 5m does not require registration in terms of dam safety.

2.1.3.6 Irrigation management

Irrigation is controlled by both the Conservation of Agricultural Resources Act and the National Water Act. The former requires that irrigated land is protected against water-logging and salination by as many of the following measures as are necessary for each particular situation:

- Catchment dams, furrows and feeder channels used for irrigation water are impermeable.
- Land is not irrigated with water that is too high in salt content.
- Soil conservation works are constructed to draw off excess surface and subterranean water so as to dispose of it to prevent the water-logging and salination of lower lying land.
- Fertilisers that could contribute to salination should be avoided.
- Soil ameliorants should be applied to land showing signs of salination.

Existing irrigators (or water users) must register their water use with the Department of Water Affairs and Forestry.

Best management practises should be implemented to ensure an efficient application of water:

- Timing and amount of irrigation should take account of the soil type, crop type and age and weather conditions. Scheduling techniques using either direct measurement of soil water status (soil auger, tension-meter or neutron probe) or estimated soil water content using computer model calculations and weather data should be used.
- Water usage should be metered to enable accurate quantification of water applied. Records should be kept to allow comparison against licensed allocated (or registered use) and actual use.
- New irrigation schemes should be designed in accordance with standards specified in the Irrigation Design Manual 1997, ISBN 1-919685-11-1 published by the Institute for Agricultural Engineering, Agricultural Research Council (www.arc.agric.gov.za). Special consideration must be given to the soil water holding capacity, infiltration rate and chemical limitations of the soil or water source. Authorisation of new irrigation schemes will be required from DWAF.
- Irrigation systems should be maintained and checked annually to ensure operation is in accordance with the design specifications.
- Quality of irrigation water must be regularly monitored to keep any soil degradation to a minimum and to sustain crops.
- Salination (accumulation of salts in the soil which adversely affects soil sustainability and thus crop production) is generally caused by poor water management such as inadequate drainage or over irrigation. Landowners must ensure that these causes are avoided.

2.1.4 Veld and forest fires are prevented

Fire can be both a friend and foe with regards to biodiversity management. Just one or two inappropriate fires at the wrong time of year, too frequent, or no fire at all, can cause local extinction of many species. As a landowner, you are responsible for the prevention and management of all fires that occur on your land, in terms of the National Veld and Forest Act of 1998. You will be assisted in complying with these regulations if you and your neighbours form a Fire Protection Association (FPA).

FPAs are voluntary associations formed by landowners to jointly prevent, predict, manage and extinguish veld fires. The main advantage of an FPA is that no presumption of negligence can be used in civil proceedings due to fire damage if you belong to an FPA, even if the fire started on your property. Furthermore, resources can be combined more effectively with other landowners to manage fires more effectively and firebreaks can be placed where best for the area as a whole, not just one property.

Where applicable every property should have a system of fire breaks in place. The breaks must be on the boundary of the property unless there is an exemption granted by the Minister or an agreement with the adjoining landowner that the firebreak be located somewhere else within an FPA. Firebreaks must be located strategically to control the spread of wildfires, but mainly serve as an access road from which to fight a fire. A sensible firebreak width is not wider than 10m and must not be burnt during times when there is a high fire risk. It is often preferable to simply have a “tracer belt” of 2/3m to allow quick access and an opportunity to use a “backburn”. Owners should ensure that firebreaks are positioned and prepared in such a way as to cause the least disturbance to soil and biodiversity. The owner should transplant protected plants within a fire break if possible or position the firebreak to avoid protected plants.

Specific points relevant to fire management are:

- Frequency: The interval between fires should be determined by the growth rate of natural existing plants and depending on the area's rainfall.)
Season: Generally, a winter or early spring burn is recommended for sour grass regions and summer or early autumn for Fynbos regions.

Intensity: Intensity is influenced by the fuel load, fuel moisture, relative humidity and wind speed. The intensity can be manipulated by selecting conditions, point of ignition relative to slope and wind that will lead to the desired type of fire.

Where a proportion of a area is burned it is vital to maintain a mosaic of different vegetation ages within a property (a variety of approved burning practices and veld ages is the best way to maintain species diversity)

Inform property neighbours and local municipality fire officers of your intention to burn at least two weeks prior to the event.

Ensure fire fighting equipment is maintained and in good working order before the start of each fire season.

Keep accurate records of fire, using a map of veld age as a basis. Note the date and time of ignition, weather conditions, etc.

Do not leave an extinguished fire unguarded for at least two days after a burn.

Annuals are vulnerable to grazing pressure by domestic stock in the first 2 years after a fire.

For more information refer to:

2.1.5 Veld and forage is managed to ensure a sustainable production of vegetation, livestock and wildlife

The legislation governing the use of veld and forage is contained in Section 6 of CARA (GN R1048 GG 10029 of 25 May 1984 as amended by GN R2687 of 6 December 1985) and requires that every land user protect the veld on the farm unit against destruction and deterioration by whatever means necessary:

- alternative grazing and rest periods should be used
- use of different types of animals
- restriction on the number of units on the veld
- use of soil conservation works to allow for grazing and resting periods, protection of the veld against excessive soil loss as a result of rain and wind, and for collection of sediments from run-off water
- reduction in numbers of animals if the veld shows signs of deterioration or the withdrawal of grazing camps until there has been sufficient recovery of the veld.

Regulation 10 requires each extension office of the Department of Agriculture to have a topocadastral map that indicates the grazing capacity of the veld, expressed as a specified number of hectares per large stock unit. Since grazing capacity will vary depending on soil type, aspect and climate the extension officer may decide that the grazing capacity of the veld on a farm unit differs appreciably so large stock units. Since grazing capacity will vary depending on soil type, aspect and climate the extension officer may decide that the grazing capacity of the veld on a farm unit differs appreciably from that specified on the topocadastral map. In this case, another grazing capacity may be applied and the land owner notified in terms of Regulation 17.

Mohair goats graze within the Suptropical thicket vegetation. Relevant succulent plant species grazed by Mohair goats in SA include thicket euphorbias (Sweet Noorsdoring (Euphorbia coerulescens), Euphorbia bothei) and Spekboom (Portulacaria afra). Some herbaceous plants and grasses (Anchorkaroo Pentzia incana), Bitterbush Chrysocoma ciliata and Couch grass Cynodon dactylon) are also browsed.

2.1.5.1 Spekboom thicket

Thicket vegetation includes 112 thicket types that have been identified and mapped for the Subtropical thicket Ecosystem Project (STEP) by Vlok and Euston-Brown (2002) (unpublished report for STEP). These included 34 solid thicket vegetation types, and 78 mosaic thicket vegetation types. Spekboom thicket, characterized by Spekboom (Portulacaria afra) is sensitive to overstocking, is a very valuable browse species as well as being of interest for carbon trading.

Intact spekboom thicket is characterized by a sparse, emergent, evergreen to weakly deciduous tree component (Pappea capensis, Euclea undulata, Schotia afra) that is surrounded by a matrix dominated by the leaf-succulent shrub Portulacaria afra (Spekboom) and mixed with a variety of multi-stemmed evergreen spinescent shrubs (Azima tetracantha, Gymnosporia polyacantha, Putterlikia pyracantha, Rhigozum obovatum, Rhus longispina). The understorey typically hosts a relatively high diversity of dwarf succulent shrubs and forbs, many of which are locally endemic and rare; grasses may be present but are not a significant proportion of the vegetation (Fig. 2a). In transformed spekboom thicket, a field layer of ephemeral or weakly perennial grasses and karroid shrubs, often dominated by the alien chenopod saltbush Atriplex lindleyi subsp. inflata or the grass Cynodon dactylon, replaces the matrix of Spekboom and perennial shrubs. In this state, the tree component is the only remnant of the original thicket, hence the term pseudo-savanna (Fig. 2b). As mentioned in the Introduction, without intervention (restoration) this pseudo-savanna is an irreversible, intermediate state on the way to desertification and complete veld degradation.
The following is relevant to Spekboom thicket maintenance and restoration.

- The shrub component in this veld forms the production base. If damaged by over-utilization the woody layer will not recover and this will not lead to the development of more productive grasslands as in other bushveld types.
- The herbaceous layer is not a reliable source of forage but is of ecological importance in enhancing infiltration and reducing soil erosion.
- Spekboom reproduces vegetative from procumbent lower side branches which, in healthy plants, form a “skirt” around the base of the plant. Goats at high densities prevents this “skirt” from developing as they browse from the “side inwards.”
- Goats, if forced, will remove a large amount of twig material, representing a loss in growing points. To recover, shrubs must regenerate growth sites before lost foliage can be replaced. This requires long rest periods and consequently, the management principle of “sacrificing” a camp following good rains to allow plants in other camps a period of undisturbed growth is not applicable in this veld type.
- The rate of recovery of shrubs after being browsed can vary, depending on defoliation intensity, season of defoliation and the prevailing environmental condition during the recovery period. For example, *P. afra* following 50% leaf removal has been known to take between 30 days and 18 months to recover to its pre-defoliation state. This means that rotational systems with fixed periods of occupation and absence are likely to be ineffective.
- Recovery should be monitored and only once recovery has taken place should re-browsing be allowed. If sub-optimal fixed rotational systems must be adopted it is recommended that periods of absence of between 211 days and 275 days be allowed following defoliation intensities of 25% to 50%.
- A cost-effective, practical, restoration method is planting cuttings of Spekboom at 1 to 3 meter intervals.
- Restoration: For seedling recruitment in degraded landscapes, it is paramount to preserve remnant clumps of closed-canopy thicket, and essential to restore closed-canopy conditions as speedily as possible.

The following should be observed regarding stocking rates on Spekboom thicket:

- Angora goats can destroy the vegetation whilst still gaining weight. The condition of goats cannot, for this reason, be used to index over grazing.
- Even with low stocking rates, Angora goats can destroy Spekboom thicket, especially in already degraded areas (M. Powell, pers comm.).
- The stocking capacity for goats, measured in large stock units (LSU), is greater for intact Spekboom thicket (0.14 LSU/ha in wet years; 0.08 LSU/ha in dry years), than for transformed landscapes (0.07 LSU/ha in wet years; <0.01 LSU/ha in drought years). The shrubs in intact thicket buffer the stocking capacity of the rangeland and enable effective stock management and planning strategies. By comparison, the stocking capacity of transformed landscapes is less buffered and is likely to decrease with time as further ecosystem decline occurs. Restoration with Spekboom cuttings does not preclude goat keeping as long as stocking rates and browsing periods are carefully managed. The ecosystem recovery rate is likely to increase if Spekboom is browsed rather than protected from herbivory.
- In dense thicket it is recommended that 85% of the total number of mature livestock comprise goats and the rest naturally occurring kudu.
- This veld type normally has a high stocking rate of kudu and this should be taken into account when setting stocking rates.

2.1.5.2 Noorsdoring veld

Noorsdoring is unique to this thicket. Where Spekboom is particularly dense Noors are generally displaced on high, mostly north facing slopes, where tillite outcrops are exposed. In this instance this broad leaved, woody species generally occur as individuals. In typical Noorsveld, this plant, which is not very nutritious and mainly consists of roughage, grows in clumps of finger like configurations. During drought periods it is cut for animal feed and together with the richness of the Karoo bush and a diversity of other plants and trees it makes for adequate feeding.

The following is relevant to Noorsdoring veld management (Grobler G. pers comm.)

- In order to use this veld to its full potential it should be camped off.
- River beds are in particular sensitive to overgrazing and seasonal rest, especially in summer months are advised.
- A good grass cover must be maintained on camps with dry runs to prevent erosion.
- Noorsveld is very “forgiving” and with rain it will re-grow spontaneously providing excellent fodder.
- Extra forage crops should be planted on all properties in this veld type as a drought reserve and to allow animals to be removed from the veld at critical times.
- Specific economic and biological objectives should be set and achievements must be monitored.
- Records must be kept of management actions and environmental perturbations which are likely to impact on the system.
2.1.5.3 Karoo veld
Most Karoo veld is regarded as sweet. The grasses maintain their palatability and nutritive value when mature and the evergreen karoo bushes provide useful browsing. This veld type is relatively sensitive to overgrazing. Once 50% of the shrubs have been grazed, the camp as a whole will already be overgrazed. Karoo bushes and woody shrubs take four months and longer to recover from a single browsing.

The following is relevant to Karoo veld management:
- The camping of different veld types is essential for the implementation of sound management practices in Karoo veld. Veld types with similar management requirements do not need to be separated. Veld which is susceptible to erosion must be separated from the rest.
- A multi camp and rotational grazing system is advised.

The following should be observed regarding stocking rates on Karoo veld:
- It is more important to aim for high production levels per animal than high production levels per ha for this veld type. This is related to the fact that sweetveld is generally limited by quantity but not quality of fodder.
- Animal numbers should be allowed to fluctuate from season to season and the breeding stock should make up a relatively small proportion of the total flock. If this is not possible, then stocking should be conservative. The rainfall in this area is more often less than the average.

2.1.5.4 Grassveld
The following is relevant to Grassveld management:
- The forage quality of this veld type is stable throughout the year and growing stock tends to maintain condition during the winter. Supplements of phosphate licks in summer may improve animal production. Where woody species have invaded browsers like goats will increase the production and limit the encroachment of woody species into grassland.
- Different veld types should be separated to minimize area-selective grazing and is important for sustainable veld quality.
- Camps greater than 100 ha should be avoided. This is critically important if costly supplementation or stock reductions in this environment are to be avoided.
- It is suggested that a third of all camps be rested each year to buffer the effect of variable rainfall and to maintain the composition of desirable species.
- A rotational grazing system will make provision for the accumulation of forage reserves in dry periods. The number of camps per group of animals may vary between six and nine to allow for rotational grazing.

2.1.5.5 Veld intensification/alternative fodder crops
Veld intensification refers to the fertilization of existing rangelands, or veld reinforcement by planting sods/seeds, usually with fertilization. In cases where the potential of some vegetation resources are limited alternative fodder crops can be established if rainfall allows. Rangeland and cultivated pastures can play complementary role but need to be carefully managed as dieback, e.g. due to insufficient rainfall, of a cultivated pasture may encourage recruitment of weedy species. Drought tolerant crops should be established in areas prone to seasonal, annual and long-term droughts. If veld intensification is practised, refer elsewhere for more details on management.

2.1.5.6 Veld monitoring
Vegetation surveys for monitoring change in veld condition should be conducted in strategic places on a property. Detailed records must be kept of any management activity or environmental perturbation so that when sites are resurveyed, any change to the condition or type of vegetation can be traced back to the management applied and/or the environmental conditions experienced. Structured visual estimates are recommended in assessing the condition of the vegetation. This involves the identification of plant communities that are likely to have different production potentials, palatability and sensitivities to degradation.

2.1.6 Plant diseases are prevented and controlled.
The Agricultural Pests Act 36 of 1993 provides for the control and prevention of plant diseases, which may require a farmer to destroy crops to prevent the spread of the disease. Farmers are also required to notify the local department of agriculture if flying locusts arrive and/or deposit eggs, or if breeding swarms of red-billed queleas are present (section 5). Where chemicals are used for pest and disease control, those with the least impact on human health and the environment should be selected. In particular, chemicals that contaminate ground and surface water should be...
2.1.7 Acquisition and use of agricultural remedies and fertilisers is controlled.

Agrochemicals include all herbicides, fungicides, insecticides, nematicides, biocides, and plant growth regulators used in agriculture. Many of these compounds have the potential to be harmful not only to man, but to the environment if not used responsibly. Also see 2.2.5.

Legislation controls the manufacture, registration, importation, packaging, labelling, storage, transport, disposal, handling and application of agrochemicals. The principal pieces of legislation are the Fertiliser, Farm Feeds, Agricultural Remedies and Stock Remedies Act 36 of 1947 and the Hazardous Substances Act 15 of 1973. It if the responsibility of every farmer who uses any form of agrochemical to be familiar with the precautions necessary to ensure that a product is safely stored and applied, and that chemical residues and containers are disposed of correctly.

2.1.7.1 Prohibited chemicals

Farmers are prohibited, in terms of the Fertilisers, Farm Feeds and Agricultural Stock Remedies Act 36 of 1947 from acquiring and using agricultural remedies that contain:

- 2,4-D (dimethylamine salt)
- 2,4-DB (sodium salt)
- Dicamba, a dimethylamine salt
- Chlorobensilate

2.1.7.2 Chemical storage

The buildings or storerooms where agrochemicals are kept need to be of sound construction, well ventilated and secure, and have adequate warning signs posted. Highly Toxic Group 1 poisons, in terms of the Hazardous Substances Act, need to be secured in a separate, locked storage area. No agrochemical may be stored near food or animal feed and the building or storeroom must not be accessible to unauthorised people. Normal safety requirements must be available e.g. water and washing facilities, fire fighting equipment and any other special requirements specified on the product label. The storage area must be easily drained and a sealed sump constructed where spillage can be collected.

2.1.7.3 Application of fertiliser and agrochemicals

To ensure the correct type and quantities of fertiliser, soil samples should be taken at regular intervals. Calibration of fertiliser equipment, placement of fertiliser application all affect crop performance and farmers should pay special attention to their management as over-fertilisation can lead to an impact on the soil and lead to acidification and nutrient imbalance.

Agrochemicals must be applied under the conditions and in the manner specified on the product label. These would typically include the concentration or application rate, the target crop, correct time (crop stage) and under the correct weather and soil conditions. After application, washing of equipment must be done in a manner that avoids contamination of soil and water.

2.1.7.4 Disposal of containers and unused chemicals

The disposal of product containers must be carried out in a responsible manner. The containers of highly toxic Group 1 poisons must be returned to the supplier for safe disposal. Other containers may be disposed of on the farm, but must be perforated and rendered unusable after draining and triple rinsing. All disposal pits should be away from human habitation, preferably in a heavy clay soil and positioned in such a manner that leachate from the pit would not contaminate water sources.

2.1.8 The use of genetically modified organisms is strictly controlled

Genetically modified organisms (GMOs) have evoked safety and ethical concerns around risks to human health and biodiversity, with the Convention on Biological Diversity (1992) providing in Article 19(3) that each contracting party to the Convention (South Africa being a contracting party) shall, as far as possible and as appropriate:

“establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from bio-technology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking into account the risks to human health”.

In South Africa, this requirement of the CBD has been addressed in the Genetically Modified Organisms Act 15 of 1997, which came into effect on 1 December 1999.

2.2 Critical ecosystem goods, services and ecological processes are maintained

Ecosystem goods include directly usable aspects of the environment such as wood for fuel, wildflowers for sale, honey from hives, and ecotourism. Ecosystem services are critical and life-supporting but are often less known to us and conserving an ecosystem may only yield benefits after some years, or may even
services and processes likely to be relevant to farmers are through e.g. Payment for Ecosystem Services (PES). Ecosystem good’ In time, producers may be compensated for this public good benefit property distant from one’s own and so constitute a ‘public good’. In time, producers may be compensated for this public good through e.g. Payment for Ecosystem Services (PES). Ecosystem services and processes likely to be of relevance to farmers are as follows:

2.2.1 Critical ecosystem services and processes are identified and plans for their maintenance and protection are included in the land use or management plan.

2.2.1.1 Hydrological

Functional wetlands and riparian areas, provided they are functional act as water sponges and will reduce flood damage, provide a process for the filtration and deposition of suspended sediments, and capture nutrients. Farmers should:
- include these details on the land use plan. Degraded wetland and riparian areas should receive priority for rehabilitation but will require an EIA in terms of NEMA.
- Not use water from wetlands (DWAF)
- Remove crops from wetlands over a period of time. Such removal may have a positive impact on the provision of water.

2.2.1.2 Physical (Fire)

Many aspects of fire management benefit both the production and conserved areas. There are several obvious objectives for using fire in biodiversity and veld management:
- to promote biodiversity in fire dependent systems (Fynbos, grasslands, savannah)
- to maintain the flower picking industry through appropriate regeneration (Fynbos)
- to remove unpalatable grasses and control bush in sour mixed bushveld (savannah)
- to reduce fire load
- to burn off unpalatable growth that remains from the previous season and which if left unburnt, will result in a moribund grassland, especially in sour veld where top growth is not all removed by grazing
- to increase crude protein in grasslands
- to stimulate growth at the end of the dry season
- to destroy parasites such as ticks
- to control the encroachment of “undesirable” plants (both woody and forbs) – this is usually only successful in a limited number of applications, usually where grazing pressure is very light
- prevent damage to fire-sensitive forest areas by burning fire-breaks adjacent to forests

In grasslands:
- Burn every two to three years in grazed grasslands
- Burn annually in ungrazed grassland, annual fires can also be used (e.g. to reduce fire hazard, block winter burns as a fire protection mechanism, etc.) If bush control is required, a less frequent fire regime, which allows for the accumulation of sufficient fuel to have an impact on the bush, should be applied. Head fires (with the wind) are more effective against bush encroachment than a back burn (against the wind), but can pose increased risks for the farmer and the neighbours. There are practical ways of resolving this, such as starting with a back-burn and then initiating a head fire that will burn towards the back-burn.

In the Fynbos:
- Burn every 8 to 20 years depending on the objectives of the land owner
- the higher the grazing pressure, the less the fuel load and the less effective is the fire.

2.2.1.3 Biological

Both plants and animals provide important ecosystem services:
- Plant roots and the herbaceous layer stabilize soils and reduce erosion. In addition, trees and woody shrubs with deep tap roots maintain water tables at levels that prevents concentration of salts in the upper soil layers. This is evident in the large-scale salinization of the Australian wheat-belt where millions of Australian dollars are now being invested in rehabilitation (www.science.org.au/nova/032/032key.htm).
- Many plants (agricultural and indigenous) depend on insects, birds and mammals for pollination, and thus seed set. These pollinating agents in turn rely on the presence of natural habitats distributed in the landscape. There is also evidence from the SA Sugar Research Institute that predation of sugarcane pests and diseases is promoted by the inclusion of natural habitats on the farm that provide refuge for the natural enemies of the pests and diseases. In addition, the presence of natural habitats provides for the seed dispersal of natural vegetation. Examples of what is required to conserve and sustainably manage pollinators with agro-ecosystems are:
  - conserve and restore habitat
  - grow flowering plants preferred by pollinators
  - use mixed farming systems
  - establish nectar corridors for migratory pollinators
  - provide habitats alongside cropland for pollinators’ nests and food
  - encouraging integrated pest management
  - discourage misuse of agro-chemicals

2.2.2 Invasive alien plants posing threats to biodiversity and ecosystem services are controlled.

Invasive alien species have a significant negative impact on the environment by causing direct habitat destruction, increasing...
the risk and intensity of wildfires, and reducing surface and sub surface water. Landowners are under legal obligation to control alien plants occurring on their properties.

### 2.2.2.1 Identification of alien species

Table 3 of CARA (the Conservation of Agricultural Resources Act) lists all declared weeds and invader plants. Alien plants are divided into 3 categories based on their risk as an invader:

- **Category 1.** These plants must be removed and controlled by all land users. They may no longer be planted or propagated and all trade in these species is prohibited.
- **Category 2.** These plants pose a threat to the environment but nevertheless have commercial value. These species are only allowed to occur in demarcated areas and a land user must obtain a water use licence as these plants consume large quantities of water. No land user may allow Category 2 plants to occur within 30m of the 1:50 year floodline of a water resource (river, stream, spring, lake dam or wetland (unless authorised in terms of the National Water Act 36 of 1998).
- **Category 3.** Existing plants do not have to be removed but no new plantings may occur and the plants may not be sold. However, if they occur within 30m of the 1:50 year flood-line of a river, stream, lake, spring, dam or wetland, then they must be removed.

### 2.2.2.2 General clearing principles

The following principles apply:

- As a minimum, the plan should include a map showing the alien density & indicating dominant alien species in each area.
- Alien control programs are long-term management projects and a clearing plan, which includes follow up actions for rehabilitation of the cleared area, is essential. This will save time, money and significant effort.
- Different species require different clearing methods such as manual, chemical or biological methods or a combination of both. For example fire is a useful tool for pines, but should not be used on the Acacia species as fire stimulates alien seed germination.
- Start clearing the lighter infested area first (with young/ immature, less dense trees) to prevent the build up of seed banks. Starting with less dense areas will also require fewer resources and have greater impact in the long term. In the case of alien species confined to rivers, it is ideal to start in the headwaters and then move downstream, thereby removing the source of re-infestation. Dense mature stands ideally should be left for last, as they probably won’t increase in density or pose a greater threat than they are at the moment.
- Collective management and planning with neighbours allows for more cost effective clearing and maintenance considering aliens seeds as easily dispersed across boundaries by wind or water courses.
- Biological control is cost-effective and very safe compared with the expense and risks associated with herbicide use, and can be successfully integrated in other management practises.

### 2.2.2.3 Alien grasses

Alien grasses are among the worst invaders in lowland ecosystems adjacent to farms, but are often the most difficult to detect and control. Alien grasses also change the fuel load of the veld causing more frequent and hotter fires, which can be detrimental to biodiversity.

To avoid alien grass invasion:

- Avoid dispersal of seed on animals (wool and hoof).
- Keep livestock that have grazed in areas infested by alien grasses while these species are seeding between August and November, from moving to areas that have not been invaded.
- Frequent fires favour alien grass invasion, therefore apply good fire prevention practices to natural areas (see 2.1.4)

To control alien grasses:

- Do not burn as research has shown that fire stimulates germination and growth of alien grasses.
- Preferably do not hand-clear as soil disturbance promotes alien grass growth
- Applying a pre-emergent, systemic herbicide has been found to be the most effective control method such as Snapshot, Gallant Super, Fusilade while Mamba and Round-up can be used for controlling Kikuyu.
- If small areas are affected, black plastic covering the grass will heat-destroy grass and seed

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**Know your aliens!**

**Category 1**
- e.g. Mauritius thorn, pom-pom weed, ink-berry, trifid weed, Chinese camphor tree, lantana, oleander, various prickly pear species, hakea species, American bramble, sesbania, bugweed

**Category 2**
- e.g. Black wattle, blackwood, silver wattle, eucalyptus, pine, poplar, castor-oil plant, weeping willow.

**Category 3**
- e.g. loquat, jacaranda, various species of privets, syringa, firethorns, cassia, tipu tree.

**Useful alien clearing contacts:**

www.nda.agric.za/docs/landcare

Working for Water: www.dwaf.gov.za/wfw

Weedbuster Hotline: 0800 005 376, weedbuster@dwaf.gov.za
2.2.2.4 The negative impacts of authorised listed or scheduled activities are minimised

Various activities, e.g. cultivation, earthmoving, land re-zoning and animal confinement, have a negative effect on the environment and are regulated by the Environment Conservation Act (ECA) 73 of 1989 (sections 21, 22 and 26) and the National Environmental Management Act (NEMA) 107 of 1998 (section 24). The former Act was replaced by NEMA on 1 July 2006, but farmers who have had authorisation under ECA still need to comply with the conditions set out in the Record of Decision. Farmers need to ensure that any of their farming activities that fell into the ECA activities between March 1998 and July 2006, or post July 2006, are authorised or exempt (section 28A of NEMA).

Activities that would affect farmers under the ECA include:

- the cultivation or any other use of virgin ground (on or after 10 May 2002). Virgin ground means land which has at no time during the preceding 10 years been cultivated;
- the construction or upgrading of dams, levees and weirs on or after 2 March 1998;
- the change of land-use from agricultural or undetermined use to any other land-use on or after 1 April 1998; or
- the change of land-use from agricultural or zoned undetermined use or an equivalent zoning, to any other land-use on or after 10 May 2002;
- the change of land-use from grazing to any other form of agricultural use (on or after 1 April 1998).

Activities that would affect a farmer under the NEMA (as from 1 July 2006) are, inter alia:

- construction of facilities or infrastructure, including associated structures or infrastructure for:
  - the concentration of animals for the purposes of commercial production in densities that exceed:
    - 20 square meters per head of cattle and more than 500 head of cattle per facility per year; eight square meters per sheep and more than 1000 sheep per facility per year; eight square meters per pig and more than 250 pigs per facility per year excluding piglets that are not yet weaned; 30 square meters per crocodile at any level of production, excluding crocodiles younger than 6 months; three square meters per head of poultry and more than 250 poultry per facility at any time, excluding chicks younger than 20 days; three square meters per rabbit and more than 250 rabbits per facility at any one time; 100 square meters per ostrich and more than 50 ostriches per facility per year or 2500 square meters per breeding pair.
  - agri-industrial purposes, outside areas with an existing land-use zoning for industrial purposes, that cover an area of 1000m² or more:
    - any purpose in the one in ten year flood-line of a river or stream or within 32 metres from the bank of a river or stream where the flood-line is unknown (including canals, channels, bridges, dams and weirs);
    - off-stream storage of water, including dams and reservoirs with a capacity of 50000m³ or more;
    - dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5m³ from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland;
    - transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered ecosystem listed in terms of Section 52 of the NEM: Biodiversity Act 10 of 2004;
    - subdivisions of portions of land 9 hectares or larger into portions of 5 hectares or less.

2.2.2.5 Significant pollution and degradation of the environment is prevented, contained, minimised or remedied

Farmers are required by law (NEMA section 28) to prevent or minimize pollution or degradation of the environment (mainly soil and water).

Soil and water pollution can be avoided by the application of best management activities at the following sites on a farm:

- Organic fertiliser stockpiles:
  - should not be placed near natural water sources or near groundwater where water can be contaminated;
  - should be protected from wind dispersal and the breeding of insects and pests (there should be no standing water at the stockpile);
- Farm workshops:
  - Wash-bay facilities should be provided for cleaning tractors and equipment, and all run-off should be directed into a protected sump to minimise contamination of ground water or water courses;
  - Old engine oil should be emptied into containers and recycled;
  - All equipment and power supply points should comply with relevant health and safety requirements.
- Farm land:
  - Servicing of vehicles in-field should not occur anywhere near a waterway or water course; oil and diesel should be drained into containers and removed, together with discarded spares.

2.2.2.6 Waste is reduced, re-used, recycled, recovered and safely disposed

Mohair producers (farmers) may dispose of waste generated as a result of normal household activities in a waste disposal site (pit) on their land. The National Environmental Management: Waste Act 59 of 2008 requires that any person that stores waste (such as a waste pit on a farm) must ensure that adequate measures are taken to prevent leakage; that waste cannot be blown away and nuisances such as odour, visual impacts and breeding of vectors do
not arise. The following applies:

- Compile a waste management plan, where waste is reduced where possible and seen as a resource that can be re-used or recycled.
- Refuse management must comply with legal prescriptions and may not pollute the environment (particularly wetlands and water sources) or create a health hazard.
- Educate farm workers and their families on waste management and recycling.
- Minimize fertiliser runoff adjacent natural areas, and especially wetlands and rivers. This runoff favours the spread of alien plants and actively poisons many indigenous plant species and aquatic animals. Department of Water Affairs and Forestry has issued target water quality guidelines, which address impacts on water quality and measures pollutants in final water body. (visit their website for these guidelines – www.dwaf.gov.za).
- Empty containers should be triple-rinsed and rendered unserviceable (puncture or cut up).
- Combustible containers may not be burned on the farm as this is an illegal practice.

2.3 Biodiversity assets and threatened ecosystems are conserved

2.3.1 Threatened and protected species as defined in legislation are protected

The National Forest Act (NFA) 84 of 1998 and the National Environmental Management: Biodiversity Act (NEM:BA) 10 of 2004, and more informally, the Stewardship Programme under the SA National Biodiversity Institute (SANBI) regulate protection or plants and animals.

Landowners are encouraged to join a Stewardship Programme and/or determine whether any threatened or protected species occur on their farms through consultation with other farmers and local conservation services. A management plan for conserving these species can be drawn up using a format such as the Draft Sustainable Resource Farm Management Plan Guidelines developed by Cape Nature and Flower Valley Conservation Trust under the Agulhas Biodiversity Initiative (www.flowervalley.org.za).

Regarding legislation, no person may cut, disturb, damage or destroy any protected tree (certain indigenous trees and all trees in forests) except under licence or as an exemption (NFA). Conducting a restricted activity (e.g. hunting) involving listed threatened or protected species requires a permit (NEM:BA).

Protected species are species of high conservation value or national importance that require national protection, and include:

- southern ground hornbill
- African marsh harrier
- Denham's bustard
- Cape clawless otter and spotted-necked otter
- hedgehog
- spotted and brown hyaena
- black footed cat
- honey badger
- reedbuck
- Cape fox
- White rhino
- Black wildebeest
- Sharpe's grysbok
- African elephant
- various cycads, disa (orchids) and euphorbias
- African rock python
- various lilies and cycads

Critically endangered species are:

- riverine rabbit
- wattled crane
- blue swallow
- Egyptian vulture
- Cape parrot
- various cycad species
- others that face an extremely high risk of extinction in the wild in the immediate future.

Endangered species facing a high risk of extinction in the wild in the near future, although they are not critically endangered include:

- geometric tortoise
- blue and grey crowned crane
- saddle-billed stork
- bearded, white-backed, Cape, hooded and lappet-faced vulture
- black rhinoceros
- mountain zebra
- oribi
- tsessebe
- African wild dog
- two species of golden mole
- various cycads and other plants.

Vulnerable species are species facing a high risk of extinction in the wild in the medium-term future, although they are not critically endangered species or endangered species, and include:

- white-headed vulture
- tawny, martial and southern banded snake eagle
- kori and Ludwigs bustard
- blue korhaan
- bald ibis
- grass owl
- batereul
- samango monkey
- pangolin
- lion
- cheetah
- leopard
- suni
- blue duiker
- roan antelope
- bontebok
- various lilies and cycads

2.3.2 Ethical and non-lethal control of damage causing animals is practised

Despite the regulations published under NEM: Biodiversity Act which permit under certain circumstances the use of lethal control measures for damage-causing listed large predators viz. lion, cheetah, leopard, brown and spotted hyaena, there is a strong thrust towards effective, non-lethal, holistic, ecologically acceptable and ethical management of predators.23

The recommended methods of predator control vary according to the predator species but consistently promote that poison, hunting dogs and leg-hold devices/gin traps should not be used, which cause morally indefensible suffering to animals, many of which are non-target individuals. This view is supported by Environmental Wildlife Trust, Landmark Foundation, the GreenChoice Alliance, WWF-SA and Conservation International in SA.

Predators such as leopards, caracal and jackals play an important role by maintaining balances in nature. They control old and
sick animals while some are excellent scavengers which devour carcasses of wildlife and other livestock.

They are territorial animals and the social behaviour of each species plays an important role in the demarcation of their territories. The injudicious removal of predators from a system results in a vacuum that causes a constant inflow of foreign animals into an area. These large numbers of foreign animals in a new habitat, desperately in need to form their own territories, will inevitably prey on easily available feed sources such as small stock. Under normal circumstances territorial animals will also suppress the breeding behaviour of their species. (Van Deventer J. pers comm.. 2008)

The random killing of predators to protect livestock does not provide a long-term solution. A balanced approach by improving the natural basis of prey; a good knowledge of the predator population on farms (especially of the dominant territorial animals); the protection of livestock in partnership with neighbouring farms; and the taking part in a coordinated predator conflict and management control initiative will in time result in a reduction of stock losses. (Van Deventer J. pers comm.. 2008)

2.3.2.1 A predator management plan is in place

The following plan is based on expert knowledge (Viljoen, pers comm. 2009). The successful management of damage causing predators requires the development of a natural habitat plan where the producer recognizes the prevalence of different predator and prey species and taking note of their numbers and behaviour. Facilities should as a preventative measure, be close to the farmstead. Nearness to human activity plays a part in predator control.

A typical integrated predator management plan would include:
- a map of watering points, lairs and territories
- details on breeding seasons
- records of production information, losses and costs of deterrent methods and reactive control measures records of species, sex, age and stomach contents of predators hunted
- Contact details of nature conservation officials regarding management of large predators
- Make preferential use of non-lethal control methods14, 23,
  - Bell collars and scent collars. These collars are inexpensive, low maintenance, very easy to fit, readily available and developed by farmers for local conditions. However, if used too frequently, they may become an attractant ‘dinner bell’ indicating the flock whereabouts rather than being deterrent working on the principle of xenophobia, the fear of new things.
  - Cell phone “Veldwagter” collars. This technology employs a transmitter with motion sensing ability. This enables a farmer to respond to the threat from a predator or stock thief. Their use is unfortunately limited to areas with cellular phone reception.
  - Fencing. This is long-term solution. Predators often dig under mesh fences, so it is important to secure the base of the mesh, or even to attach a base mesh at 90 degrees to the fence, i.e. flat on the ground, to prevent predators from digging underneath. Adequate and effective overhangs or electrification can be considered if there are species present that climb over fences.
  - Frightening devices. These may include lights and noises, such as FM radios and VHF radio alarm systems, used to frighten and confuse predators at night. As with bell and scent collars, if frightening devices are used frequently, predators will become accustomed to the noises and ignore them. Frightening devices can be used in camps for short periods of time.
  - Guardian animals
    - There is a renewed interest in more effective, traditional ways of guarding livestock, e.g. alpacas and Anatolian guard dogs
      - The use of Anatolian shepherd dogs is effective when they are correctly selected, trained and used according to the guidelines. Genetics plays a major role in a particular dogs’ effectiveness. Conditioning consists largely of placing puppies in the environment where they will spend the rest of their lives. They should bond...
and spend their time as one of the flock.

- Some goat owners have found donkeys to make excellent guard animals. A single donkey, usually a female gets introduced to the flock and undergoes a natural bonding phase. Males seldom work because they can be too aggressive, particularly with younger goats. A donkey will, after bonding, protect goats against canine predators as if they were its own. Donkeys are thought not to cover as much area as dogs.

- Alpacas can also be used as guard animals. Research indicates that the effectiveness of Alpacas stems from their curious and fearless nature. Goats that attach themselves to the alpacas are seldom bothered by predators.

  - King Collars and ‘Dead Stop Collars’. The King Collar is a wide, adjustable PVC collar that is fitted to the neck of each member of the flock and adjusted once or twice a season. They make it difficult, if not impossible for a jackal to kill by a throat bite. The Dead Stop Collar is a more robust mesh wire collar than the King Collar and protects the flock against attacks by caracal, which have a strong jaw and skull structure and may bite through King collars.
  
  - Scent marking where predators have been deterred by territorial marking using urine, which can be collected before the kidding season and sprayed onto fence posts and gates.

- When lethal methods are considered, care should be taken that these are legal according to the various provincial regulations; are always be executed by competent professional people; are quick and humane to limit suffering; and are are cost effective relative to the livestock losses experienced. The NEM:BA regulations (R152 in GG No. 29657) deal in detail on the permit system for the control of listed threatened or protected damage-causing species.

- Landowners who are faced with crop damage or livestock loss from damage causing animals must be aware of the regulations and comply strictly with the conditions contained in the permit (see NEM: Biodiversity Act).

- While any person may, in terms of section 88(1) of the Biodiversity Act, apply for a permit (regulation 5(1) of R152 in GG No. 29657), the actual process is dependent on a number of requirements, the detail of which is beyond the scope of a generic document.

### 2.3.3 Threatened ecosystems are protected.

The National Spatial Biodiversity assessment showed that 34% of ecosystems are threatened, with 21 (5%) critically endangered, 58 (13%) endangered, 70 (16%) vulnerable and 298 (66%) least threatened, indicating a dire need for ecosystem conservation.

The National Biodiversity Framework (NBF) required in terms of the Biodiversity Act was recently (October 2009) gazetted by the Department of Environmental Affairs (DEA). The NBF is based on the National Biodiversity Strategy and Action Plan (NBSAP). The framework has identified 33 priority actions to guide the work of the biodiversity sector for the next five years and provides targets for these priority actions. For more information visit www.deat.gov.za

Now that there is officially a national ecosystem protection system, there is excellent opportunity to conserve biodiversity through partnerships between the landowners of both private and communal land, conservation authorities and government. Farmers are encouraged to know the conservation status of their area using the free online Biodiversity GIS facility of SANBI (http://bgis.sanbi.org) and the framework offered by DEAT. Consult the Eastern Cape Biodiversity Conservation Plan (ECBCP 2007, http://bgis.sanbi.org/mapsearch.asp).

Examples of existing stewardship programmes are The Biodiversity Stewardship Programme (C.A.P.E and CapeNature, contact 021 866 8000, http://www.capenature.org.za/projects.htm) and Biodiversity Stewardship South Africa (contact Endangered Wildlife Trust, https://www.ewt.org.za) which provide a hierarchy of increasing support (alien clearing, land management advice) in the following way:

1. Conservation Areas - Conservation Areas are flexible options with no defined period of commitment (includes conservancies).
2. Biodiversity Agreements - Biodiversity Agreements are negotiated legal agreements between the conservation agency and a landowner for conserving biodiversity in the medium term.
3. Contract Nature Reserves - Contract Nature Reserves are legally recognized contracts or servitudes on private land to protect biodiversity in the long term.

It is only the Nature Reserves that attract compulsory zero based rates in terms of the Local Government Municipal Property Rates Act.

Stewardship practises, some of which have already been mentioned as part of conserving the agricultural resources, are:

- inclusion of all transformed and untransformed (natural) land in a land use plan and mapped
- invasive plant control, controlled burning, litter management, road construction and maintenance, fencing, poaching control, hunting, game counts, species check lists, etc, depending on the size of the operation.
- Removal of crops in or near to wetlands
- Rehabilitation of degraded areas using indigenous grass species or commercially available species such as Eragrostis curvula can be considered.
- If extraction process are carried out (e.g. flower harvesting) these should be sustainable (see www.flowervalley.org.za for a sustainable harvesting guide).

Biodiversity

Biodiversity or biological diversity is the variability among living organisms from all sources, including, among others, terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

3. Animal Health and Well-being Principle

The following section draws on various references. In general, The Animal Health Act 7 of 2002 was promulgated to promote animal health and to control animal diseases and to regulate the importation and exportation of animals.

3.1 Management practices

A large number of husbandry/management practices are required in any Angora goat farming enterprise and Mohair producers must accept the responsibility for the following. (Odendal D. Pers comm. 2008)

- Provision of adequate nutrition for maintenance, growth and reproduction
- Prevent pain, injury and disease by good animal health practices
- Provide the environment for goats to express natural behaviour
- Protection from fear and distress
- Protection from predation
- Protection when exposed to life threatening weather conditions
- Controlled use of animal health remedies and prevention of exposure to unnecessary or illegally imposed toxins

3.1.1 Facilities

3.1.1.1 Shelter

Goats tolerate cold weather well, as long as they are dry and out of the wind. They require shelter from the extremes of weather. This may be as simple as a shelterbelt tree plantation, or a windbreak. Where a building is used to supply shelter, it should be designed and maintained to provide clean, well-ventilated and sanitary conditions. Adequate ventilation should be provided when animals are housed indoors to reduce the risk of pneumonia and the chilling of kids. Goats should have access to a well-drained area for rest and ruminiation. Ruminants also need a good fill of feed to help them combat the cold. Goats also like to be in or near a shed during the night hours. Shorn goats, kids, pregnant goats and goats in a weaker condition are particularly sensitive to cold and exposure. The timely provision of high energy supplements will alleviate this problem.

3.1.1.2 Handling facilities

Goats are motivated by instinct and tempered with a very sharp memory. They are creatures of habit, and once familiar with a set of pens or handling procedures, will expect to be treated the same way each time. They should be handled quietly when penned. Excessive noise and rough handling upsets them. Goats exhibit a natural “flocking” behaviour; when one or two start to move, they all do. Well designed goat handling facilities, and the ease with which animals flow through them, have important implications for the welfare of goats. All races and enclosures must be free from sharp projections, corners and broken rails that may cause goats to injure them.

3.1.1.3 Shearing facilities

Shearing facilities should comprise of:
- Adequate overnight facilities with slated floors
- Individual slated catching pens
- Individual inspection pens
- A wooden shearing board
- Adequate lighting and fresh air
- Absence of a draft

3.2 Animal Husbandry Practices

3.2.1 Castration

There are a number of techniques that can be used to castrate kids. The use of an emasculator is advocated as the best and safest method (Prinsloo, NSPCA, pers comm. 2009) if performed by a competent person. Alternatively an elastrator band can be placed around the neck of the kids scrotum. This technique consists of applying a small, stout, rubber ring around the scrotum and above the testes with the aid of a specially designed applicator. As the blood supply is cut off, the scrotum and testes become necrotic and drop off (slough) in due course. Although it appears to be very painful initially, the kid behaves normally within a short time.

The testicles may also be surgically removed. The bottom one-third of the scrotal sac is removed with this method. The testicles are then withdrawn one at a time. The chords are severed by repeated scraping movements with a sharp, sterilized knife. Scraping causes confusion of the blood vessels and promotes blood clotting. In order to limit bleeding, this operation should be performed in the early morning or late afternoon when it is comparatively cool. Kids should be confined in a pen or paddock prior to the operation so that they are rested. Bleeding from the open wounds can be reduced considerably by applying a five per cent solution of copper sulphate. The operation must be performed hygienically and the knife and hands of the operator must be disinfected regularly. After the operation, wounds should be disinfected and the kids should be left quietly with their mothers. Kids should be allowed to settle down before they should be allowed to slowly proceed to the veld.

When castration is practiced it should be done before or up to the age of six weeks (Larson and Bath pers comm. 2009). Though banded kids are most vulnerable, immunity against tetanus is recommended for all castration methods. Wounds should be inspected regularly, and when necessary treated for maggot infestation, or septic conditions.

3.2.2 Hoof care

In areas where goats are kept on soft, sandy soil, their hooves tend to grow out too long. Hooves may become permanently deformed and the animal will be crippled. As it is difficult to cure an already deformed hoof, it is necessary to prevent deformity by regular trimming with a knife, or pruning (foot-rot) shears. Hooves of goats that are kept in stables, or stalls with slated floors
can also become overgrown and should be trimmed regularly. Trimming of hooves is easier when animals have been on damp soil for a day or two. When trimming hooves avoid stressful times like hot weather or late gestation.

### 3.2.3 Horn Trimming

The removal of horns from adult goats is unacceptable as a farm practice and should only be performed by a registered veterinarian under anaesthesia. The horns of rams and some kappater (castrated) goats may need to be cut back to avoid injury from an ingrown horn, injury to other goats and to allow free movement through handling races. The removal of the tip of the horn in adults is acceptable if done above the 'quick' where the tissue is devoid of nerves and blood vessels.

### 3.2.4 Kidding

Ewes should be allowed to kid with as little interference as possible. Kidding under grazing conditions should be supervised to ensure that ewes having difficulty when giving birth are given attention. When assistance is necessary it should be provided by a competent attendant using good standards of hygiene and accepted veterinary techniques. The flocks should be under adequate surveillance to ensure that other problems, such as pregnancy toxaemia and predation, are not occurring. If the risk of bad weather at kidding is high - access to shelter or a sheltered paddock is recommended.

### 3.2.5 Orphan kids

Where stray kids can be identified they should be given proper attention by reuniting them with their mothers, raising them as orphans or euthanizing them.

### 3.2.6 Shearing

Shearing should preferably be done by accredited shearers and it is imperative that shearers observe the industry quality standards as prescribed in the NWGA shearing manual. The shearing manual is standard issue to all trainees participating in a NWGA shearer training courses. The manual is also available at the regional offices of the NWGA. Shearing is stressful to goats.

- Undue handling of goats must be avoided
- Care should be taken not to expose shorn goats to adverse weather conditions.
- Goats should be returned to food and water as soon as possible after shearing.
- Where circumstances indicate, shearing cuts should be treated with a disinfectant to prevent infection.

### 3.2.7 Health precautions

Prevention of disease transmission is of utmost importance during shearing. The correct disinfection and sanitary procedures must be followed to prevent the spread of infectious diseases by shearing equipment and shearers within a flock or between flocks.

- Dead animals should not be skinned in a shearing shed.
- Sick animals should not be housed in a shearing shed
- Skin and pelt should not be treated, dried or stored in a shearing shed
- Before shearing commences the entire shearing shed should be cleaned and disinfected.
- After completion of shearing all Mohair should be classed, packed and removed from the shed and shearing equipment should be disinfected.
- Shearing equipment should be disinfected at regular intervals during shearing to stop the spread of disease.
- Shearers should change into a clean pair of trousers once they cut an abscess. When this happens the shearing area should also be disinfected.
- Care should be taken that young goats are shorn first in order to prevent disease transmission from older animals.

### 3.2.8 Identification of Goats

Ear marking instruments should be sharp, with the cutting edges undamaged, so as to prevent tearing of the ear. The ear may be tattooed, tagged, notched or hole-punched. Electronic identification methods may also be used. Animals should be marked from the age of 30 days according to the Animals Identification (Act no 6 of 2002).

### 3.2.9 Euthanasia of goats

Effective and humane methods of euthanasia which cause a quick and painless death must be used when there are no other alternatives to either prolong life or to limit pain. The humane destruction of animals (Prinsloo K. pers comm. 2009) should be performed by the following methods:

- Pre-stunning using a captive bolt pistol, then a cut to the throat with a sharp knife of suitable length ensuring that the trachea (windpipe) and both carotid arteries are cleanly severed.
- Electrical immobilisation, then a cut to the throat with a sharp knife of suitable length ensuring that the trachea (windpipe) and both carotid arteries are cleanly severed.
- A clean shot to the head using a fire-arm
- In case of emergency, a sharp knife of suitable length must be used to ensure that the trachea (windpipe) and both carotid arteries are cleanly severed.

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**NWGA Shearing Manual**

The NWGA Shearing Manual is a complete guideline to best practice and producers are encouraged to obtain it from:

NWGA Shearer Training Division,
PO Box 4520, Bloemfontein, 9300.
Tel 051 4473023
3.2.10 Transport

The following key elements of importance should always be considered when handling goats.

3.2.10.1 Penning of goats
- Goats must always be penned separately from other animals.
- Goats should always be penned in different age groups.
- 0.56 sq.m. of floor area must be provided per goat.
- There must be an adequate supply of water and food.

3.2.10.2 Handling
- Goats must be handled with patience and tolerance with due allowance for their natural behaviour.
- Goats may be caught above the heel or by the horn, depending of their ages.
- Goats should not be dragged by their legs.
- The South African Mohair industry does not condone the use of electric prodders.

3.2.10.3 Movement on the hoof
- Goats on the hoof shall be driven in a calm manner at a gait that is relaxed, natural to that animal, and not faster than the pace of the slowest animal.
- Goats may not be moved for a distance greater than 20 kilometres on the hoof on the first day and more than 15 km on consecutive days.
- Goats shall be watered and fed immediately on reaching their night camp or final destination, with sufficient food of a quality and of a type compatible with the species.
- Contingency plans must be in place to move by vehicle any goat that becomes exhausted, lame or otherwise unable to keep up with the herd.

3.2.10.4 Vehicles used in transport

Vehicles must be licensed and roadworthy and a removal certificate must accompany stock.
- All such vehicles and trailers shall have:
  - a suitable non-slip floor.
  - adequate ventilation and light whilst in motion as well as when stationary; no vehicle shall be totally enclosed.
  - side-walls must high enough to prevent a goat from escaping or falling out of the vehicle.
  - The sides and partitions, when used in a vehicle to separate animals carried therein, shall be of a height not lower than the shoulder joint of the largest animal being transported.
  - The minimum height should be 750 mm.
  - The density of goat packed into any given space shall be such as to ensure there safety and comfort. The average recommended floor space per animal is as 0.4 m².
  - Different age groups should be kept apart and may require more or less floor space.
  - Should not stop for more than 30 min (Transport Act)

3.2.10.5 Watering and feeding prior to loading

Goats shall be provided with sufficient and suitable food and fresh water up to commencement of the journey.

3.2.10.6 Loading and off-loading procedure
- Loading and off loading of livestock into or out of a vehicle shall be accomplished as quietly and calmly as possible, with patience and tolerance and without undue harassment, terrifying of the animals, bruising, injury, suffering or undue stress.
- Animals shall be promptly off-loaded on arrival at the destination.

3.2.10.7 Restraining livestock during transport
- Goats may not be kept in restraint for more than 4 h in any 24-h period.
- No wire or bailing twine shall be used for tying a goat’s legs or feet.
- To avoid strangulation or neck-break, a slip knot may not be used where animals are secured to the vehicle by the horns or neck. The rope must be attached to the vehicle at the level of the goats ‘knees’, so that in the event of the goat falling, the possibility of serious injury or death is reduced. The rope should be long enough to allow a goat to lie comfortably in a natural position with the head in an upright position.

The following web page should be visited for detail information. www.samic.co.za/SAMIC/HandlingTransport.htm

3.2.11 Nutrition

Adequate nutrition for maintenance, growth and reproduction must be provided as a key element to Angora goat well being\(^1\).\(^2\).\(^3\).\(^4\) Angora goat farming is usually practiced under extensive farming conditions in the summer rainfall region of South Africa. Reasons for under performance can usually be related to insufficient feeding during some stage of the reproduction phase. Breeding stock should be kept in above-average condition throughout the year. If condition seems to be declining, then grains should be added to the diet to increase the energy content of the ration. High energy supplements should be given to ewes at the first sign of abortions. Kids should be creep-fed until weaning. Supplementary feeding should be provided during their first year to maximize growth and Mohair production.

In case of a full-feeding or supplementary feeding system, diets should be formulated by a professional animal nutritionist to prevent metabolic disorders and accompanied unnecessary discomfort, pain and deaths. Goats should be excluded, as far as possible, from toxic plants and other substances suspected of being deleterious to their health. As a good practice feed must be of good quality and free of moulds and poisonous plants and seeds. The use of animal by-products (e.g. bloodmeal, bonemeal, chicken litter) should not be allowed.

For more information the policy on animal feed should be visited (under Act 36 of 1947)
3.2.11.1 Water
Goats should have access to clean, palatable and adequate volumes of drinking water. Regular assessment should be made of the quality and quantity of water supply with attention to the special needs of lactating ewes and to goats in hot weather. Watering points should be of sufficient capacity and safe access must be provided. Mechanical equipment, controlling the delivery of water, (including windmills and boreholes) should be inspected regularly and frequently, in hot weather, and kept in good working order. The quality of water provided should be adequate to maintain health. Voluntary water consumption is 2 or 3 times dry matter consumption and it increases with high-protein and salt-containing diets. Drinking water, which contains potentially toxic levels of salts, or other harmful substances, should be monitored and managed to minimize harmful effects. Where sufficient good quality water to maintain health cannot be provided, goats should be moved to other areas where an adequate supply is available. As a guide, goats should not be deprived of water for more than 24 hours. This period should be reduced during late pregnancy, kidding and in the event of hot weather.

3.2.11.2 Drought
Drought is defined as a severe food and/or water shortage during prolonged periods of abnormally low rainfall. A drought is not a normal seasonal decline in the quantity and quality of food available. Property strategies for drought management should be prepared well in advance and progressively implemented. Where drought feeding is indicated, it should be started before normal grazing feed runs out. For optimum results goats should be fed in different age and condition groups.

Goats that are fed for survival should be observed carefully at feeding times. Weak animals may require segregation for special treatment.

Goats should not be allowed to starve. Where minimal water and food requirements cannot be met supplemental feed should be given if it is economically viable. Grazing could be hired or the stock must be sent for slaughter to prevent suffering. Drought affected goats are highly susceptible to stress and require careful handling and treatment.

3.3 Health and Disease management strategy

In general:
- All medicines must be used in the prescribed manner when treating goats.
- The label instructions must be followed strictly to ensure successful administration and to avoid risks to goats, workers, consumers and the environment.
- Individuals handling and applying medicines must be trained and able to demonstrate appropriate competence and knowledge of diseases.
- The use of hormonal growth promoters should be limited and is not allowed with organic farming systems.
- Medicines past their expiry date and used medicine containers must be disposed of in a manner agreed to with the attending veterinarian so that it will not result in subsequent misuse.

3.3.1 Medicine Storage
- Medicines must be stored in accordance with the label instructions in a sound, secure, locked and well lit location, away from other materials, like feedstuff. The same apply for medicines that require refrigeration.
- Emergency information and facilities must be available to workers to deal with accidents e.g. eyewash, plenty of clean water
- Medicines must be stored in their original containers.

3.3.3.1 Sub-cutaneous inoculation with vaccines
The equipment must be sterile at the start of the procedure. Needles should be sterile and always handled on the hub and not on the sterile shaft. It is preferable to use a new needle for each animal, especially in cases of disease outbreaks. The shaft should always be slid under the skin until the hub rests against the skin. The skin of the goat must be dry and the injection site clear of visible dirt.

3.3.3.2 Intramuscular injections
For intramuscular injections a safe site is found by dividing the distance between the hip bone and the seat bone and then positioning the injection in the middle of the foremost half and on the line between the two bones. The needle is pressed through the skin and into the muscle but not deep enough to strike underlying bone. The plunger of the syringe must be drawn back in an attempt to suck blood into the syringe. If no blood is seen at the tip of the syringe it can be assumed that the needle is not in a blood vessel and the drug for intramuscular injection can be injected.

3.3.4 Dosing
Dosing guns must be calibrated regularly. When administering remedies, carefully place the nozzle of the gun through the side of the mouth until resting on the back of the goats tongue. Deposit the drench slowly. If the head is bending back too much the drench may flow into the lungs and must be avoided.

3.3.5 Disease and pest control
Sick, injured or diseased goats should be given prompt and appropriate treatment or must be humanely slaughtered. Preventative measures should be used for goat diseases that are common in a district. Remedies should be administered in strict accordance with the manufacturer’s instructions and veterinary prescription medicine must be used as prescribed by the veterinarian.
Angora Goat farmers are encouraged to make sure that they buy and sell stock that is free from ecto parasites and to quarantine goats when necessary. This will prevent the unnecessary use of pesticides.

**Spinosad** (Trading as Extinosad)

Extinosad is a safe and effective against lice - dip, spray, jetting and wound dressing product for goats. It has a zero meat and mohair withdrawal period.

Registered in Sept. 2009

*SANS 10205:2005*

Angora Goat farmers are encouraged to visit the following website for a complete Checklist on the storage, handling and disposal of pesticides on farms.

www.stansa.co.za/...

Collection of Dangerous Goods Standards

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### 3.3.6 Additional strategies for internal parasite control

- **Provide good nutrition and minimize stress.** Research has shown that animals provided with high-protein rations are more resistant to parasites. Combine high-protein plants and those high in tannins, such as the legume birds foot trefoil.

- **Use the de-worming products that are allowed strategically.** The use of faecal samples before and after de-worming to measure a product’s effectiveness is recommended.

- **To prevent infection rotate pastures and avoid over-grazing.** Rotational grazing with different species is recommended.

- **Move kids to clean pasture at five to six weeks of age, when they begin to eat significant amounts of forage.** If possible use forward creep grazing so kids have clean pastures before their dams. Avoid grazing kids on contaminated pasture. Also, avoid grazing kids on the same perennial pasture two years in a row.

- **Make sure pastures are well drained as eggs and larvae develop faster and disperse quicker in wet pastures.** Preferably graze when dew or rain has dried off forage. Also, monitor growing conditions that contribute to parasite development. Be prepared to move kids and de-worm if necessary.

See Appendix 3: Angora Goat Management program (Snyman G. pers comm. 2009)

### 3.3.7 External parasites - biting lice

Infestation starts from contact with infested goats and good management are required to avoid this problem. A dipping declaration by the previous owner should be part of any purchase documentation. Alternatively, purchase stock must be kept in quarantine until treated for lice as a preventative measure. Monitor all goats for lice infestation – Lice are most prevalent in wintertime. When infected dip all goats, including kids with a registered product. When dipping is not possible, treat all goats, including kids with two treatments (Davey 2009, pers comm.) of a registered pour-on. It is a good practice to notify your neighbours.

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### 3.3.8 Dipping

Animals should be dipped at least once, shortly after shearing. Newly shorn animals require less dip, and dipping is also more effective at this stage. Dip animals preferably two to six weeks after shearing, as the Mohair is then long enough to retain dip. Angora goats should be handled carefully because they are more nervous than sheep and tend to panic. The animals should be separated into various age groups to prevent the larger animals from injuring the smaller ones. Each goat should be lowered into the dip gently, hindquarters first, and should not be turned on its back. The head should remain above the water for a while to allow for normal breathing, and then be submerged twice with a dipping stick, again allowing time for breathing between dipping. Hereafter the goat proceeds to the draining pen.

Goats should not be driven for long distances immediately after dipping. In hot weather it is best to keep the animals in kraals until it becomes cooler. Dipping should, as far as possible, be done in early morning on a mild, sunny day. This will allow the animals to dry properly.

Where tortoise-shell ticks (‘bont’-legged ticks) are most active, belly baths are recommended during October and December, whereas belly baths for Karoo paralysis ticks are normally done from March to August. In heartwater areas, dipping at ten to fourteen day intervals may be necessary.

### 3.3.9 Pesticides

Chemicals in the form of residual pesticides on greasy Mohair are a threat to the environment and the image of the South African Mohair industry.

#### 3.3.9.1 Chemical groups (Russel IM, Nunn CR 2006)

There are four main types of chemicals available to control mites, lice and blowflies in South Africa.

These are:

- Organophosphates (OP)
- Insect growth regulators (IGR)
- Macrocyclic lactones (ivermectins)
- Synthetic pyrethroids (SP)
- Spinosad

List of Parasiticides registered and deregistered for use on Angora goats in South Africa (January – March 2008 - IVS) (See Factsheet 1)

#### 3.3.9.2 Know the risks (Russel IM, Nunn CR 2006)

The different chemical groups have various degrees of relative risk relating to operator health, pest resistance and Mohair residues. Understanding these risks will help when deciding what, if any, chemical to use. Organophosphates (e.g. diazinon etc) pose the greatest risk to human health. Due to the high incidence of fly and lice resistance to chemical groups, the advice from chemical suppliers and veterinary authorities must be sought.

#### 3.3.9.3 What you can do

The key to reducing reliance on chemicals is to use an integrated parasite management (IPM) approach to control ectoparasites. However, if you need to use chemicals, select those with minimal risk. The two main IPM elements are:

- **Management options** (e.g. reduce susceptibility to a risk of lice and mite introduction).
- **Selective use of chemicals** (e.g. only treat when required).
3.3.9.4 **Ectoparasiticide withdrawal periods**

Drug residues in Mohair should be minimized by accepting the following measures: Avoid full body treatment as far as possible in the last two months before shearing. Specific withdrawal periods must be fully complied with. Spinosad is the only product registered with a zero animal product withdrawal period. (Bath G. pers comm., 2009)

3.3.9.5 **Herbicide withholding periods**

The minimum number of days between the last application of herbicides and grazing or harvesting of pastures must be observed according to the registration of a product.

3.3.9.6 **Testing for chemical residue**

Tests for chemical residue could be carried out (Strydom A. pers comm. 2008) in accordance with the appropriate IWTO test method. (Currently IWTO-DTM-59-04).

3.3.9.7 **Handling of chemicals**

Chemicals need to be handled, stored and used in a responsible manner as prescribed by the occupational health and safety legislation and the latest regulations supporting this legislation.

The following guidelines concerning farm chemicals are of importance in Angora goat farming systems.

**Chemical Stores and management:**
- The store should be located above the 50-year flood line
- Only authorized and trained personnel shall have access to keys and the store
- Person responsible for managing pesticide store (farmer/literate farm worker) must be trained in pesticide handling & understand implications of incorrect handling
- Only plant protection and/or animal health products are allowed in the store – no feedstuffs
- Shelves must be non-absorbent, impervious and chemically resistant to products – wooden shelves covered with thick plastic is recommended
- Large containers should not be stored directly on cement floor – place on wooden pallets covered with thick plastic or on plastic pallets
- Products in solid, powder or granular form must be stored above liquid formulations (less damage during accidental leakage)
- All products must be stored in original containers with labels intact
- The responsible person shall ensure that oldest stock is used first (label date of manufacture or mark container with date of delivery in waterproof ink)
- Keep records away from storage area. A copy can also be kept in store

4. **Social Principle**

Angora goat farming and Mohair production is an economic activity which does not take place in a social/ethical vacuum and as such must be, and be seen to be, compliant with acceptable social and ethical norms and standards.

The social principle is: The rights and well-being of employees and the local community are upheld and promoted, and product hygiene practices are in place.

The farm business must be socially sustainable and must show a commitment to a safe and enjoyable workplace for partners, employees and family members. The purpose of the Labour Relations Act 66 of 1995 is to ensure fair labour practices as contained in the Bill of Rights of the Constitution of the Republic of South Africa.

4.1 **Human rights**

All employers should respect the following core labour rights of the International Labour Organisation:
- No forced labour
- No child labour
- Freedom of association and the effective recognition of the right to organise and bargain collectively.
- No discrimination

4.2 **Basic Conditions of Employment Act 75 of 1999**

All employees, South African or foreign, are entitled to certain conditions of employment:
- Arranged working time and hours.
- Leave including annual leave, sick leave and maternity leave.
- Rights on termination on employment including notice and severance pay.
- The provision of certain particulars of employment such as a pay slip and certificate of service.
- Minimum age of employment.
- A decent wage should be paid to all farm employees.
- No children under 15 must be employed on farms. Children between the ages of 15 and 18 must only be employed in work that does not place at risk their well being, education, physical or mental health, or spiritual, moral or social development.
- The terms and conditions of seasonal employees, employees on fixed term contracts and other forms of a typical employment should be appropriately regulated and they should receive benefits proportionate to those received by permanent employees.

4.3 **Labour relations**

Employee conflict on farms should be minimised by ensuring that it is well-managed by the involved parties. Both employees
and employers should ensure that their actions are lawful and procedural. All farms should have an accessible and appropriate grievance and disciplinary procedure in place.

### 4.4 Skills development

The skills of all farm employees need to be enhanced so as to improve productivity and employability in the Mohair farming industry. It is recommended that SAQA registered qualifications and mentorship programs be encouraged.

### 4.5 Occupational health and safety

The following applies:

- The working environment on farms should be safe and healthy. This includes protection against occupational diseases and accidents.
- Farm employees should be made aware of the contingency procedures relevant to their enterprise in the event of emergencies which pose a threat to human health, food safety or livestock health and welfare. These contingency procedures must cover the event of failure of the food and water supply.
- Mohair growers should do an assessment of the risks that exist on their farms and develop a plan to minimise such risks including the adoption of preventative measures.
- Employees must have access to basic first aid and medical treatment to be administered by a trained employee.
- Employees are entitled to compensation in the event of an occupational injury or disease. To ensure this, farm employers must register with the Compensation Fund and pay their assessments.

### 4.6 Social security and benefits

The following applies:

- Employees are entitled to unemployment insurance if they become unemployed. To ensure this, farm employers must register with the Unemployment Insurance Fund and pay their contributions together with those of their employees.
- Employers should endeavour to ensure that farm employees have access to pension or provident funds, medical aid, funeral or death benefits.
- Employers whose employees live on the farm should ensure that housing and sanitation meets acceptable standards.

### 4.7 Security of Tenure – The Land Reform Act 3 of 1996

Employees (Labour tenants) and their family members are:

- Allowed to occupy and use land they were occupying or using on or before 2 June 1995.
- Employers must ensure that should there be a need to terminate the above right it is done within the provisions of this Act.

- Labour tenants may only be evicted in terms of a court order under this Act.
- The rights of labour tenants that, subject to the provisions of this Act, want to acquire land, must be respected.

### 4.8 Productivity

Productivity improvement is the result of many factors including increased skill, greater job satisfaction, more appropriate use of technology, etc. and it is the responsibility of both employer and employee. Both should identify the factors that can lead to improved productivity at the workplace.

### 4.9 HIV/AIDS

Testing of employees to establish their HIV status is prohibited in terms of the Employment Equity Act. Employers should ensure that all those living on farms should have access to a prevention programme including awareness rising, condoms and counselling.

### 4.10 Contract Labour

Suitable housing should be provided for contract workers, e.g. shearers. This includes:

- Sleeping facilities
- Ablution facilities
- Where food is not provided, adequate enclosed cooking facilities must be available.

It is recommended that contract workers like shearers have an 8-h, 5-day working week with days divided into 4x2 h working shifts. Less working hours and days will result in a loss of productivity and income for shearers.

---

**An excellent website!**

Farmers are encouraged to view the Department of Labour’s website (www.labour.gov.za) which contains all relevant legislation, as well as key information related to specific subjects: annual leave, basic guides of key topics within labour legislation, forms and sample rights of contracted labour.

---

Where farmers use contract labour the guidelines should be applied as if the contractors are farm workers, but acknowledging the limitations placed on the landowner by the labour laws.
5. References


3. Cowling RM 2008 Spekboom soaks up CO₂. www.urbansprout.co.za

4. Biodiversity and Wine Initiative 2006, as an extension of the abbreviated biodiversity guidelines that are part of the IPW farm guideline (available on the IPW website, www.ipw.co.za).


10. SANS 10206:2005. Checklist for storage, handling and disposal of Pesticides on farms


13. Sell R. 1993. Angora Goat, Alternative Agriculture Series, Number 7, Department of Agricultural Economics, NDSU

14. Scotcher JS 2009 Development of Generic Principles, Criteria and Indicators for Sustainable Farm Management in South Africa. Unpublished report prepared for WWF. Available from GreenChoice Alliance (hhawkins@conservation.org.za or tvbormann@wwf.org.za)


16. Agri SA Vision for Labour Relations in Agriculture


### Appendix 1: Self-assessment Checklist for Sustainable Mohair Producers

#### Self-assessment Checklist for Sustainable Mohair Producers

Submit to: Mohair SA, info@mohairsa.co.za; +27 41 4871386 (tel); +27 41 4871336 (fax)
Queries to EF (Smiley de Beer), natwool@com2000.co.za; 028 212 3160 (tel)

<table>
<thead>
<tr>
<th>Producer status levels</th>
<th>Principles</th>
<th>Score</th>
<th>Organic</th>
<th>Legality</th>
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<tbody>
<tr>
<td>PLATINUM</td>
<td>Economic</td>
<td>0</td>
<td>n/a</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Environmental</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Animal</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Social</td>
<td>0</td>
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<tr>
<td>Total</td>
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#### Sustainable Mohair Production Indicators

<table>
<thead>
<tr>
<th>Economic Indicators</th>
<th>Yes</th>
<th>n/a</th>
<th>Indicator weight</th>
<th>Yes score</th>
<th>n/a score</th>
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<tr>
<td>Totals</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A farm vision is prepared and regularly reviewed</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>A financial plan exists</td>
<td>0.8</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>A product marketing strategy is in place</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cash flow budgets are annually prepared and regularly reviewed</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Asset/liability records are kept and annually analysed</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Income and expense records are kept and annually analysed</td>
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<tr>
<td>Economic threats are identified and an action strategy exists</td>
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<td>0</td>
<td>0</td>
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<tr>
<td>Climate change is recognised and an adaptation strategy exists</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>An energy efficiency strategy exists</td>
<td>1</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>You have benefited economically from reduced agrochemical inputs (e.g. judicious use of dipping instead of routine, preventative dipping)</td>
<td>2</td>
<td>0</td>
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<tr>
<td>You have benefited economically from alien clearing (e.g. increased stream flow)</td>
<td>1</td>
<td>0</td>
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<td>0</td>
<td></td>
</tr>
<tr>
<td>You have benefited economically from ecosystem goods and services (e.g. ecotourism)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>You have benefited economically from belonging to a fire protection association (e.g. reduced insurance premiums)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>The business complies with relevant legislation</td>
<td>0.2</td>
<td>0</td>
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</table>

#### Veld and soil

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<tr>
<th>Environmental Indicators</th>
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<th>n/a</th>
<th>Indicator weight</th>
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<th>n/a score</th>
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</thead>
<tbody>
<tr>
<td>Totals</td>
<td>0</td>
<td>0</td>
<td>0.025</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Veld types are mapped on the landuse plan</td>
<td>0.025</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Veld types are monitored for degradation and restored</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Stocking rates as prescribed</td>
<td>0.025</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Rotational grazing is practiced</td>
<td>0.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Alternative crops are established for drought years and veld rest requirements</td>
<td>0.3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Care is taken that weeds are not spread by stock</td>
<td>0.025</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
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<tr>
<td>Soil is mapped according to type and erodability on the landuse plan</td>
<td>0.025</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Soil management is practiced to prevent wind and water erosion</td>
<td>0.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Soil organic content and microbial activity are increased through practising strategic grazing patterns and re-use of animal/plant residues</td>
<td>0.4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Soil surfaces are protected by maintaining vegetative cover</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Appropriate cultivation practices are followed</td>
<td>0.3</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Landuse is legal</td>
<td>0.025</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Category</td>
<td>Description</td>
<td>Score</td>
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<td></td>
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<tr>
<td>------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
<td>-------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>Conservation areas are mapped on the landuse plan</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Endangered vegetation and animals in your area are protected</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>You make use of Biodiversity GIS and similar mapping services</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10% or more land is set-aside for conservation</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Land set-aside includes a vegetation corridor (e.g. along a river)</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A plan to connect vegetation corridors with those of neighbors' exists</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The farm benefits from ecosystem goods (e.g. wildflower harvesting, honey, ecotourism) and/or services (e.g. water, soil, pollinators, natural insect enemies)</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>You are part of a conservancy/land care/land stewardship or similar program</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Genetically modified organisms (GMOs) are not used on-farm or as feed</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damage causing animals are managed according to legislation</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-lethal predator control methods used in preference to lethal methods</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deterrents such as guardian animals (dogs, donkeys, alpacas) are used to scare off predators</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gin- or leghold traps are not used to control damage causing animals</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If traps are used, these are checked regularly, and animals in these traps are euthanized and non-target animals are rescued</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poison is not used to control damage causing animals</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hunting with dogs or denning is not used to control predator animals</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>You are able to control predators through non-lethal methods alone</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fire</strong></td>
<td>You belong to a fire protection association</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A system of fire breaks is in place, where applicable</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neighbors and municipal officers are notified two weeks in advance of burning event</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fire-fighting equipment is well maintained and staff are trained in fire management</td>
<td>0.005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td>Water use/sources meet legal requirements</td>
<td>0.005</td>
<td></td>
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<tr>
<td></td>
<td>You belong to a water management forum</td>
<td>0.1</td>
<td></td>
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<tr>
<td></td>
<td>Water resources are used sustainably</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Groundwater levels are monitored</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Care is taken not to contaminate water resources</td>
<td>0.025</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>You are aware of the quality of available water</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soil moisture is monitored to optimize irrigation and maintain soil quality</td>
<td>0.25</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Irrigation system is designed according to soil and plant type</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Application limits water run-off</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Irrigation system is monitored for leaks and nozzle efficiencies</td>
<td>0.05</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Wetlands and water ways are mapped on the landuse plan</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wetlands and water ways are utilized in accordance with legislation</td>
<td>0.025</td>
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</tr>
<tr>
<td></td>
<td>Use of the wetlands (e.g. harvesting) is sustainable</td>
<td>0.025</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wetlands and waterways form part of a conserved vegetation corridor</td>
<td>0.5</td>
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<tr>
<td><strong>Alien plants</strong></td>
<td>You are informed of alien plants in your area</td>
<td>0.025</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alien plants are mapped on your landuse plan</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>An alien plant eradication plan is implemented</td>
<td>0.1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>You have experienced benefits of alien plant eradication</td>
<td>0.025</td>
<td></td>
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<tr>
<td><strong>Waste</strong></td>
<td>Waste is reduced where possible</td>
<td>0.05</td>
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<tr>
<td></td>
<td>Waste is re-used or recycled</td>
<td>0.025</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Waste not re-used/recycled is safely disposed</td>
<td>0.025</td>
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</table>
### Agrochemicals

<table>
<thead>
<tr>
<th>Activity</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Inorganic fertilizers are avoided</td>
<td>0.5</td>
</tr>
<tr>
<td>Organic fertilizers are used</td>
<td>0.05</td>
</tr>
<tr>
<td>Herbicides and pesticides are not used</td>
<td>0.5</td>
</tr>
<tr>
<td>There is no possibility of fertilizer run-offs from neighbouring farms</td>
<td>0.05</td>
</tr>
<tr>
<td>Only legally registered chemical products are used according to label instructions</td>
<td>0.025</td>
</tr>
<tr>
<td>A designated lockable chemical store is available</td>
<td>0.025</td>
</tr>
<tr>
<td>An inventory of products bought, used and stored is kept</td>
<td>0.025</td>
</tr>
</tbody>
</table>

### Energy

An energy saving strategy is developed and implemented to mitigate and adapt to climate change: 0.1
Solar, wind or water energies (renewable energies) are used: 0.4

### Animal Wellbeing Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Weight</th>
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<tbody>
<tr>
<td>A written flock-risk and health-care plan exist</td>
<td>0.7</td>
</tr>
<tr>
<td>Drenching is used when needed, i.e. not preventatively</td>
<td>0.6</td>
</tr>
<tr>
<td>Growth hormones are not used</td>
<td>0.5</td>
</tr>
<tr>
<td>Breeding material are selected for hardiness, disease and parasite resistance</td>
<td>0.5</td>
</tr>
</tbody>
</table>

### Animal Health

A written flock-risk and health-care plan exist: 0.7
Drenching is used when needed, i.e. not preventatively: 0.6
Growth hormones are not used: 0.5
Breeding material are selected for hardiness, disease and parasite resistance: 0.5

### Endoparasites

Medicine storage is legally compliant: 0.05
An inventory (date purchased, used, which stock, expiry) is kept: 0.05
Withholding periods are strictly applied: 0.05
Double withholding periods are practiced: 0.05
Records are kept of antibiotics treatments. x2 p/a for organic standard: 0.05
Medicine storage is legally compliant: 0.05
An inventory (date purchased, used, which stock, expiry) is kept: 0.05

### Disease Control

Present registration requirements does not comply with EU chemical residue standards. A two month mohair withholding period from the time of full body dipping to shearing is recommended: 0.05
An Integrated Pest Management (IPM) approach is followed, e.g. biological control, sanitize shearsers, quarantine sick goats etc.: 0.7
Stock are treated for ectoparasites when movement between properties takes place: 0.1
Treatment records from sellers of stock are available and are requested: 0.1
Fences are properly maintained: 0.05

### Animal Feed

A fodder bank is kept: 0.05
Feed ingredients such as urea, hormones, antibiotics, animal derived materials, synthetic appetizers, growth promoters or coccidiastatics do not form part of feed: 0.5
Feedstuffs are not derived from genetically modified organisms: 0.4
Records of all feed purchase are kept and are available: 0.05
Proof that animal feed is 100% organically-grown can be given: 0.05

### Animal Welfare

Animals are handled and transported in accordance with legislation: 0.7
Facilities are adequate to prevent injuries and discomfort: 0.7
Correct procedures are followed when euthanizing stock: 0.7
Sick and or injured stock are identified and kept separate for treatment: 0.7
Kids are castrated before the age of six weeks: 0.4
Electric prodders are not used: 0.7
Goats are not deprived of water for longer than 24 hours: 0.7
There is adequate shelter to protect goats from the elements: 0.7
<table>
<thead>
<tr>
<th>Social Indicators</th>
<th>Yes</th>
<th>n/a</th>
<th>Indicator weight</th>
<th>Yes score</th>
<th>n/a score</th>
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</thead>
<tbody>
<tr>
<td><strong>Totals</strong></td>
<td>0</td>
<td>1</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A training needs analysis is done for every employee on an annual basis</td>
<td></td>
<td></td>
<td>0.9</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Employees are supported by skills development programs</td>
<td></td>
<td></td>
<td>1.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Employees are confident to conduct meetings according to their work needs</td>
<td></td>
<td></td>
<td>0.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>People management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work programs and performance reviews are set annually for every employee</td>
<td></td>
<td></td>
<td>0.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Personal goals are set for staff to ensure time management and to reduce personnel stress</td>
<td></td>
<td></td>
<td>0.7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>All workers have signed a contract</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>All workers understand the Basic Conditions of Employment Act</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Legally required records relating to your employees are kept</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Workers have proper accommodation</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Workers have accommodation with running water and sanitation</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Workers have accommodation with electrical power supply</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>An occupational health and safety protocol is in place</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>A disciplinary code is in place</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Workers are registered for unemployment benefits and workman's compensation</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Workers have annual and other leave according to the BCE act</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Permanent labour</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract labour are provided with suitable sleeping and ablution facilities</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Contract labour comprises an 8 hour day and 5 day working week. Days are divided in four 2-hour working shifts for shearsers</td>
<td></td>
<td></td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Employer wellbeing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You make adequate time for rest and recuperation</td>
<td></td>
<td></td>
<td>1.2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>You have time to participate in community activities</td>
<td></td>
<td></td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The original checklist was commissioned by the National Clean Production Centre of South Africa and Authored by Claire Janisch and Aletta Venter.

<table>
<thead>
<tr>
<th>Total ha of farm</th>
<th>ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total ha conserved on farm</td>
<td>ha</td>
</tr>
<tr>
<td>Number and type of ecosystem goods/services used on farm</td>
<td>Number Type(s)</td>
</tr>
<tr>
<td>Area cleared of aliens</td>
<td>ha</td>
</tr>
<tr>
<td>Percentage savings on agrochemicals/other inputs since (date)</td>
<td>%</td>
</tr>
<tr>
<td>Percentage increase in profit since (date)</td>
<td>%</td>
</tr>
<tr>
<td>Number of communities employed/uplifted</td>
<td>Date Number</td>
</tr>
<tr>
<td>Other successes or data you would like to share</td>
<td></td>
</tr>
</tbody>
</table>

*A partner of Mohair SA and the SA Mohair Growers Association
Contact: Dr. HJ Hawkins, 021 7998832, hhawkins@conservation.org
Angora Goat Production Norms
This information is used to calculate production norms and to develop a profile for losses occurred.

Production norms 1 March to 28 Feb

<table>
<thead>
<tr>
<th>Farm</th>
<th>Ha Farm</th>
<th>Ha Range and Forage</th>
<th>Number Breeding ewes</th>
<th>Kg Mohair Produced</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Progeny</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heads sold</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistics 1 March to 28 February

<table>
<thead>
<tr>
<th>Reason for losses</th>
<th>Jackal</th>
<th>Links</th>
<th>Leopard</th>
<th>Theft</th>
<th>Disease</th>
<th>Blowfly</th>
<th>Weather</th>
<th>Other</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count: Kids Kapaters Ewes</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
<td>K</td>
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</tr>
<tr>
<td></td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td></td>
</tr>
</tbody>
</table>

Unit value in rand

Predator statistics 1 March to 28 February

<table>
<thead>
<tr>
<th>Predator Killed (species)</th>
<th>Age</th>
<th>Sex</th>
<th>Stomach content – Any evidence of stock?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Young</td>
<td>Mature</td>
<td>Old</td>
</tr>
</tbody>
</table>

Declaration by the Producer
I hereby declare that the information given is correct.

Contact name:.............................................................................................................................................
Name of Business / Farm:..............................................................................................................................
Producer Name:..........................................................................................................................................
Producer Number:..........................................................................................................................................
Postal address:.............................................................................................................................................

E-mail:.........................................................................................................................................................
Telephone:.......................................................................................................................................................
Cell phone:.....................................................................................................................................................
Date:.............................................................................................................................................................
## Appendix 2: Drug Store and Usage Record

**Registration Number:** _______________________________   **Year:** _____________

<table>
<thead>
<tr>
<th>DATE</th>
<th>PRODUCT INFO</th>
<th>USAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Product name</td>
<td>Batch no.</td>
</tr>
<tr>
<td></td>
<td>Expiry</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Purchase</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Usage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treatment</td>
<td></td>
</tr>
</tbody>
</table>

|-------------------------|------------|-----------|

Signature of authorised person

Indiv. No. Group No.
### Appendix 3: Livestock management calendar for Angora goats in the Eastern Cape

<table>
<thead>
<tr>
<th>Month</th>
<th>Activity</th>
</tr>
</thead>
</table>
| January   | Dose all goats broad spectrum anthelmintic  
Kids dose broad spectrum incl. tape worm (4 month-old kids)  
Kids Pulpy kidney 2 + Pasteurella 2 (4 month-old kids)  
Wean kids (4 month-old kids)  |
| February  | Ewes, rams and young goats Pulpy Kidney + Pasteurella  
Ewes Enzootic Abortion (April/May mating group)  
Finalise mating ewe flock (April/May mating group)  
Flushig mating flock if required (April/May mating group)  
Ram kids to be kept as sires - Rev1 (5 month-old kids)  |
| March     | Fertility testing of rams (April/May mating group)  
Kids Rift Valley fever + Wesselsbron disease (6 month-old kids)  
Market surplus animals  |
| April     | 6 to 8 week Mating period (April/May mating group)  |
| May       | –  |
| June      | Dose all goats broad spectrum incl. nasal worm  
Scan ewes for pregnancy 42 days after mating (April/May mating group)  |
| July      | Supplement ewes last 6 to 4 weeks of pregnancy if required (September/October kidding group)  |
| August    | All goats Pulpy kidney + Pasteurella  
Supplement ewes last 6 to 4 weeks of pregnancy if required (September/October kidding group)  |
| September | Ewes are kidding (September/October kidding group)  
Supplement lactating ewes if required (September/October kidding group)  |
| October   | Dose all goats broad spectrum  
Supplement lactating ewes if required (September/October kidding group)  |
| November  | Kids 8 weeks : Pulpy Kidney 1 + Pasteurella 1 (2 month-old kids)  
Kids 8 weeks : Dose against Milk tape worm (2 month-old kids)  |
| December  | –  |

**Comments**  
Apart from the strategic drenchings mentioned in the programme, faecal egg counts should be done regularly to determine if additional drenchings are necessary, especially in the rainy season.
**Factsheet 1: List of Parasiticides**

List of Parasiticides registered for use on goats in South Africa (January – March 2008 - IVS)
Deregistered, and for the past 20 years also illegal to use products

### ECTOPARASITICIDE CHART - SHEEP

<table>
<thead>
<tr>
<th>Trade name</th>
<th>Reg no</th>
<th>Active Ingredients</th>
<th>Company</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Organophosphors and carbamates</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coopers Supadip</td>
<td>G3349</td>
<td>Chlorfenvinphos 30%</td>
<td>Afrivet</td>
<td>Cap,O,B</td>
</tr>
<tr>
<td>Cooperzon 30</td>
<td>G821</td>
<td>Diazinon 30%</td>
<td>Afrivet</td>
<td>Cap,O,P</td>
</tr>
<tr>
<td>Daz-Dust 2%</td>
<td>G421</td>
<td>Diazinon 2%</td>
<td>Bayer</td>
<td>B,Cap,O,E</td>
</tr>
<tr>
<td>Dazzel NF</td>
<td>G582</td>
<td>Diazinon 30%</td>
<td>Bayer</td>
<td>Cap,G,P</td>
</tr>
<tr>
<td>Disnis NF Dip</td>
<td>G1015</td>
<td>Chlorfenvinphos 9%</td>
<td>Bayer</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>PAB-NF</td>
<td>G961</td>
<td>Propetamphos 0.14%</td>
<td>Bayer</td>
<td>Cap,O</td>
</tr>
<tr>
<td>Supona 30 Cattle Dip</td>
<td>G1284</td>
<td>Chlorfenvinphos 30%</td>
<td>Bayer</td>
<td>B,Cap,O,</td>
</tr>
<tr>
<td>Supona Aerosol</td>
<td>G411</td>
<td>Chlorfenvinphos 0.5%, Dichlorphos 0.83%, Gemtian Violet 0.1%</td>
<td>Bayer</td>
<td>B,Cap,O,E</td>
</tr>
<tr>
<td>Tiguvon Spot-on</td>
<td>G145</td>
<td>Fenthion 20%</td>
<td>Bayer</td>
<td>B,Cap,O,E</td>
</tr>
<tr>
<td>Zipdip</td>
<td>G381</td>
<td>Triazophos 40%</td>
<td>Intervet</td>
<td>Cap,G,P</td>
</tr>
<tr>
<td><strong>2. Pyrethrins and pyrethroids</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blitzdip Aerosol</td>
<td>G1049</td>
<td>Cypermethrin 1%</td>
<td>Bayer</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Bodygard Pour-on</td>
<td>G3424</td>
<td>Flumethrin 1%</td>
<td>Pfizer</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Clout Pour-on</td>
<td>G1447</td>
<td>Deltamethrin 1%</td>
<td>Afrivet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Coopers Expel</td>
<td>G3245</td>
<td>Deltamethrin 0.10%, resins and oils 99.39%, germicide 0.51%</td>
<td>Afrivet</td>
<td>Cap,O</td>
</tr>
<tr>
<td>Coopers Redline Pour-on</td>
<td>G3445</td>
<td>Flumethrin 1%</td>
<td>Afrivet</td>
<td>Cap,O</td>
</tr>
<tr>
<td>Coopers Zero Tick</td>
<td>G1029</td>
<td>Cyalothrin 5%</td>
<td>Afrivet</td>
<td>B,O</td>
</tr>
<tr>
<td>Curatik Dip</td>
<td>G505</td>
<td>Cypermethrin 15%</td>
<td>Bayer</td>
<td>B,O</td>
</tr>
<tr>
<td>Cylenque Liquid</td>
<td>G1725</td>
<td>Cyfluthrin 1%</td>
<td>Bayer</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Decatix 3 Spray</td>
<td>G1348</td>
<td>Deltamethrin 2.5%</td>
<td>Afrivet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Delete Pour-on</td>
<td>G2815</td>
<td>Deltamethrin 0.5%, Pipbutox 2%</td>
<td>Intervet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Delete X5</td>
<td>G3279</td>
<td>Deltamethrin 5%</td>
<td>Intervet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Delkol Pour-on</td>
<td>G3550</td>
<td>Deltamethrin 1%</td>
<td>Intervet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Deltab Tablets for Spraying &amp; Dipping</td>
<td>G2517</td>
<td>Deltamethrin 25%</td>
<td>Intervet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Drastic Deadline Pour-On</td>
<td>G723</td>
<td>Flumethrin 1%</td>
<td>Bayer</td>
<td>B,O</td>
</tr>
<tr>
<td>Ectomin</td>
<td>G3313</td>
<td>Cypermethrin 100g/l</td>
<td>Novartis</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Ectopor Pour-on</td>
<td>G3313</td>
<td>Cypermethrin 20g/l</td>
<td>Novartis</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Langa-dip</td>
<td>G3513</td>
<td>Cypermethrin 20%</td>
<td>Elangeni</td>
<td>B,O</td>
</tr>
<tr>
<td>Maxipour Pour-on</td>
<td>G3567</td>
<td>Flumethrin 1%</td>
<td>Cipla Agrimed</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>MDB Cyperdip</td>
<td>G2769</td>
<td>Cypermethrin 15%</td>
<td>Ceva</td>
<td>B,O</td>
</tr>
<tr>
<td>Paracide</td>
<td>G791</td>
<td>Alphamethrin 7%</td>
<td>Pfizer</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>ProDip CYP 20% Liquid</td>
<td>G2311</td>
<td>Cypermethrin 20%</td>
<td>Virbac</td>
<td>B,O</td>
</tr>
<tr>
<td>Stopatik Liquid</td>
<td>G1431</td>
<td>Cypermethrin 2%, Piperonyl butoxide 8%,</td>
<td>Virbac</td>
<td>B,O</td>
</tr>
<tr>
<td>Wipe-out</td>
<td>G1434</td>
<td>Deltamethrin 0.5%</td>
<td>Afrivet</td>
<td>Cap,O</td>
</tr>
<tr>
<td><strong>3. Formamidines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amidip 200</td>
<td>G2601</td>
<td>Amitraz 20%</td>
<td>Virbac</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Supatraz 25%</td>
<td>G3581</td>
<td>Amitraz 25%</td>
<td>Cipla Agrimed</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Tactic Cattle Spray</td>
<td>G2535</td>
<td>Amitraz 12.5%</td>
<td>Intervet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Tactic TR Cattle dip</td>
<td>G2537</td>
<td>Amitraz 23.75%</td>
<td>Intervet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Triatix 125</td>
<td>G3189</td>
<td>Amitraz 12.5%</td>
<td>Afrivet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Triatix 250</td>
<td>G3190</td>
<td>Amitraz 25%</td>
<td>Afrivet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td>Triatix 500 TR</td>
<td>G3256</td>
<td>Amitraz 50%</td>
<td>Afrivet</td>
<td>B,Cap,O</td>
</tr>
<tr>
<td><strong>4. Chitin synthesis inhibitors (Insect Growth Regulators - IGRs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FleeceCare Liquid</td>
<td>G1743</td>
<td>Diflubenzuron 25%</td>
<td>Intervet</td>
<td>Cap,O</td>
</tr>
<tr>
<td>Vetrazin Pour-on</td>
<td>G1397</td>
<td>Cypermazine 100g/l</td>
<td>Novartis</td>
<td>O</td>
</tr>
<tr>
<td>Vetrazin Powder</td>
<td>G525</td>
<td>Cypermazine 500g/kg</td>
<td>Novartis</td>
<td>O</td>
</tr>
<tr>
<td>Zapp Pour-on</td>
<td>G2926</td>
<td>Triflumuron 2.5%</td>
<td>Bayer</td>
<td>Cap,O</td>
</tr>
<tr>
<td>Zapp Spray</td>
<td>G2335</td>
<td>Triflumuron 48%</td>
<td>Bayer</td>
<td>Cap,O</td>
</tr>
</tbody>
</table>
### 5. Macrocyclic Lactones

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Active Ingredient</th>
<th>Brand</th>
<th>Form</th>
<th>Reg No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Experto Vet</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moxidectin 0.5% combined with Ag+Sel+Vit</td>
<td>Moxidectin</td>
<td>Bayer</td>
<td>O.Cap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moxidectin 0.5% combined with antigens</td>
<td>Moxidectin</td>
<td>Bayer</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doramectin 1%</td>
<td>Doramectin</td>
<td>Pfizer</td>
<td>B.Cap, O, P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Afrivet</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 0.08%</td>
<td>Ivermectin</td>
<td>Cap.O</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Cipla Agrimed</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 0.08%</td>
<td>Ivermectin</td>
<td>Cipla Agrimed</td>
<td>Cap.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Ourofino</td>
<td>B.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Merial</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Merial</td>
<td>Cap.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 80mg/capsule</td>
<td>Ivermectin</td>
<td>Merial</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 160mg/capsule</td>
<td>Ivermectin</td>
<td>Merial</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%, Clorsulon 10%</td>
<td>Ivermectin</td>
<td>Merial</td>
<td>B.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Intervet</td>
<td>O.Cap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Elangeni</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Norbrook</td>
<td>Cap.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Norbrook</td>
<td>B.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Ceva</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Schering-Plough</td>
<td>B.O.P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Virbac</td>
<td>B.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 1%</td>
<td>Ivermectin</td>
<td>Virbac</td>
<td>B.O,Cap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivermectin 0.2%</td>
<td>Ivermectin</td>
<td>Virbac</td>
<td>O</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Combinations

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Active Ingredient</th>
<th>Brand</th>
<th>Form</th>
<th>Reg No</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorfenavinphos 1%, Cypermethrin 1% PBO 5%</td>
<td>Chlorfenavinphos, Cypermethrin</td>
<td>Virbac</td>
<td>B.Cap, O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cypermethrin 0.05%, Chlorfenavinphos 1%</td>
<td>Cypermethrin, Chlorfenavinphos</td>
<td>Bayer</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deltamethrin 0.5% PBO 2.5%</td>
<td>Deltamethrin</td>
<td>Afrivet</td>
<td>B.Cap.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amitraz 2%, Piperinyl butozide 2%, Deltamethrin 0.5%</td>
<td>Amitraz, Piperinyl butozide, Deltamethrin</td>
<td>Intervet</td>
<td>B.Cap, O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amitraz 1% Cypermethrin 1% PBO 5%</td>
<td>Amitraz, Cypermethrin</td>
<td>Elangeni</td>
<td>B.Cap.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorfenavinphos 1%, Cypermethrin 0.1%, Pine Oil 4%</td>
<td>Chlorfenavinphos, Cypermethrin, Pine Oil</td>
<td>Bayer</td>
<td>B.Cap, O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amitraz 1.5% Deltamethrin 0.5% PBO 3%</td>
<td>Amitraz, Deltamethrin</td>
<td>Afrivet</td>
<td>B.Cap.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dichlorophen 1%, Propetamphos 0.25%, Pine Oil 2.5%</td>
<td>Dichlorophen, Propetamphos, Pine Oil</td>
<td>Bayer</td>
<td>B.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dichlorophen 1%, Propetamphos 0.25%</td>
<td>Dichlorophen, Propetamphos</td>
<td>Bayer</td>
<td>B.O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorfenavinphos 30%, Esfenvalerate 2.2%</td>
<td>Chlorfenavinphos, Esfenvalerate</td>
<td>Bayer</td>
<td>B.Cap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorfenavinphos 0.0125%, Dichloropren 0.015%, Chlorocres 0.5%, Gentian Violet 0.15%</td>
<td>Chlorfenavinphos, Dichloropren, Chlorocres, Gentian Violet</td>
<td>Virbac</td>
<td>B.Cap, Cap, E,O, P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorfenavinphos 30%, Alphamethrin 3%</td>
<td>Chlorfenavinphos, Alphamethrin</td>
<td>Bayer</td>
<td>B.Cap, O</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Deregistered, and for the past 20 years also illegal to use products.

<table>
<thead>
<tr>
<th>Brand name</th>
<th>Reg no</th>
<th>Banned Toxin</th>
</tr>
</thead>
<tbody>
<tr>
<td>x-BHC Dip</td>
<td>G236</td>
<td>Lindane</td>
</tr>
<tr>
<td>x-BHC NF Dip</td>
<td>G622</td>
<td>Lindane</td>
</tr>
<tr>
<td>Lindane 15% BHC (Lindane)</td>
<td>G147</td>
<td>Lindane</td>
</tr>
<tr>
<td>Bont-Tox Dipand Spay</td>
<td>G57</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Bromotox Dip</td>
<td>G1118</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Disnis Aerosol</td>
<td>G147</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Disnis Livestock Dip</td>
<td>G58</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Lindane “Flo” Scab Dip</td>
<td>G315</td>
<td>Lindane</td>
</tr>
<tr>
<td>Lindane “Flo” SGD</td>
<td>G591</td>
<td>Lindane</td>
</tr>
<tr>
<td>Nexa Ban Tick Oil</td>
<td>G63</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Nexa-Ban Tick Grease</td>
<td>G62</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Nexanagan Tick Dip</td>
<td>G52</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Supalin 40</td>
<td>G424</td>
<td>Lindane</td>
</tr>
<tr>
<td>Tick and Maggot oil</td>
<td>G795</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Tick Oil</td>
<td>G912</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Tixban Tick Grease</td>
<td>G1155</td>
<td>Camphechlor</td>
</tr>
<tr>
<td>Tixban Tick Oil</td>
<td>G1154</td>
<td>Camphechlor</td>
</tr>
</tbody>
</table>
Factsheet 2: Organic production criteria

The following applies:

1. Soil management and fertilisation
   - Tillage and cultivation practices that maintain and increase soil organic matter, enhance soil stability, soil biodiversity, prevent compaction and erosion must be practiced.
   - Multiannual crop rotation including legumes and other green manure crops and the application of livestock manure or organic material must be practiced and administered to enhance fertility and biological activity of soil.
   - The use of biodynamic preparations is allowed.

Fertilisers and soil conditioners that may be used in organic production are described in Annex 1 of Commission Regulation (EC) No 889/2008 of 5 September 2008

See Factsheet 2

Pests, disease and weed management


See Factsheet 3

2. Grazing

Organic animals may be grazed on common land providing that:
   - The land has not been treated with products not authorised for organic production for at least 3 years.
   - When they are being moved on foot from one grazing area to another.

3. Animal well being

3.1 Husbandry Practices

Physical castration is allowed as a traditional practice subject to the authorisation by the competent authority for reasons intended to improve the health, welfare or hygiene of livestock on a case-by-case basis.

3.2 Feeding

At least 50% of the full feed must come from the farm unit itself or produced in cooperation with other organic farms primarily in the same region.
   - Kids must be fed on maternal milk in preference to natural milk for at least 45 days.

Only non-organic feed materials of plant and animal origin may be used in organic production if they are listed in Annex V of Commission Regulation (EC) No 889/2008 of 5 September 2008

Records of documented evidence must be kept

See Appendix 1

See summary - Factsheet 4

3.3 Animal-health

3.3.1 Disease Prevention
   - The use of chemical synthesized allopathic veterinary medical product or antibiotics for preventative treatment is prohibited.
   - Substances like antibiotics, coccidiostatics and other artificial aids to promote growth and the use of hormones or similar substances to control reproduction is prohibited.

3.3.2 Veterinary treatment
   - When animals become sick or injured they must be treated immediately.
   - Phytotherapeutic, homeopathic products, trace elements and other products listed in Annex V of Commission Regulation (EC) No 889/2008 must be used in preference to chemically-synthesized allopathic veterinary treatments or antibiotics provided that their therapeutic effects are effective.
   - If necessary the use of chemically-synthesized allopathic veterinary products or antibiotics may be used under the responsibility of a veterinarian.
   - With the exception of vaccinations, treatments for parasites and compulsory eradication schemes. Vaccinations and treatments for parasites is allowed when practiced strategically
   - Where an animal or groups of animals receive more than three courses of treatment with chemically-synthesized allopathic veterinary products or antibiotics within 12 months, products may not be sold as organic and the conversion period must start again.
   - The withholding period between the last administration of an allopathic veterinary medicinal product to an animal under normal conditions of use, and the production of organic foodstuffs from such animals, is to be twice the legal withdrawal period. In a case in which this period is not specified a withdrawal period of 48 hours is applicable.

Records of documented evidence must be kept
# Fertilisers and Soil conditioners for Organic Production Systems

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compound products or products containing only materials listed hereunder: Farmyard manure</td>
<td>Product comprising a mixture of animal excrements and vegetable matter (animal bedding); Factory farming origin forbidden</td>
</tr>
<tr>
<td>Dried farmyard manure and dehydrated poultry manure</td>
<td>Factory farming origin forbidden</td>
</tr>
<tr>
<td>Composted animal excrements, including poultry manure and composted farmyard manure included</td>
<td>Factory farming origin forbidden</td>
</tr>
<tr>
<td>Liquid animal excrements</td>
<td>Use after controlled fermentation and/or appropriate dilution; Factory farming origin forbidden</td>
</tr>
<tr>
<td>Composted an fermented household waste</td>
<td>Product obtained from source separated household waste, which has been submitted to composting or to anaerobic fermentation for biogas production. Only vegetable and animal household waste. Only when produced in a closed and monitored collection system, accepted by the Member State. Maximum concentrations in mg/kg of dry matter: cadmium:0.7; copper:70; nickel:25; lead:45; zinc:200; mercury:0.4; chromium (total):70; chromium (VI):0</td>
</tr>
<tr>
<td>Peat</td>
<td>Use limited to horticulture (market gardening, floriculture, arboriculture, nursery)</td>
</tr>
<tr>
<td>Mushroom culture wastes</td>
<td>The initial composition of the substrate shall be limited to products of this Annex</td>
</tr>
<tr>
<td>Deject of worms (vermicompost) and insects</td>
<td></td>
</tr>
<tr>
<td>Guano</td>
<td></td>
</tr>
<tr>
<td>Composted or fermented mixture of vegetable matter</td>
<td>Product obtained from mixtures of vegetable matter, which have been submitted to composting or to anaerobic fermentation for biogas production</td>
</tr>
<tr>
<td>Products or by-products of animal origin as below: blood meal, hoof meal, bone meal, degelatinized bone meal, fish meal, meat meal, feather, hair, “chiquette” meal, wool, fur</td>
<td>Maximum concentration in mg/kg of dry matter of chromium (VI): 0</td>
</tr>
<tr>
<td>Products and by-products of plant origin for fertilisers</td>
<td>Examples: oilseed cake meal, cocoa husks, malt culms</td>
</tr>
<tr>
<td>Seaweed and seaweed products</td>
<td>As far as directly obtained by: (i) physical processes including dehydration, freezing and grinding, (ii) extraction with water or aqueous acid and/or alkaline solution, (iii) fermentation</td>
</tr>
<tr>
<td>Sawdust and wood chips</td>
<td>Wood not chemically treated after felling</td>
</tr>
<tr>
<td>Composted bark</td>
<td>Wood not chemically treated after felling</td>
</tr>
<tr>
<td>Wood ash</td>
<td>From wood not chemically treated after felling</td>
</tr>
<tr>
<td>Soft ground rock phosphate</td>
<td>Product as specified in point 7 of Annex IA.2. of Regulation 2003/2003, Cadmium content less than or equal to 90 mg/kg of P₂O₅. Use limited to basic soils (pH&gt;7.5)</td>
</tr>
<tr>
<td>Basic slag</td>
<td>Products as specified in point 1 of Annex IA.2. of Regulation 2003/2003</td>
</tr>
<tr>
<td>Crude potassium salt or kainite</td>
<td>Products as specified in point 1 of Annex IA.3. of Regulation 2003/2003</td>
</tr>
<tr>
<td>Potassium sulphate, possibly containing magnesium salt</td>
<td>Product obtained from crude potassium salt by a physical extraction process, containing possibly also magnesium salts</td>
</tr>
<tr>
<td>Stillage and stillage extract</td>
<td>Ammonium stillage excluded</td>
</tr>
<tr>
<td>Calcium carbonate (chalk, marl, ground limestone, Breton ameliorant, maelr), phosphate chalk</td>
<td>Only of natural origin</td>
</tr>
<tr>
<td>Magnesium and calcium carbonate</td>
<td>Only of natural origin e.g. magnesium chalk, ground magnesia, limestone</td>
</tr>
<tr>
<td>Magnesium sulphate (kieserite)</td>
<td>Only of natural origin</td>
</tr>
<tr>
<td>Calcium chloride solution</td>
<td>Foliar treatment of apple trees, after identification of deficit of calcium</td>
</tr>
<tr>
<td>Calcium sulphate (gypsum)</td>
<td>Products as specified in point 1 of Annex ID. Of Regulation 2003/2003, Only of natural origin</td>
</tr>
<tr>
<td>Industrial lime from sugar production</td>
<td>By-product of sugar production from sugar beet</td>
</tr>
<tr>
<td>Industrial lime from vacuum salt production</td>
<td>By-product of the vacuum salt production from brine found in mountains</td>
</tr>
<tr>
<td>Elemental sulphur</td>
<td>Products as specified in Annex ID.3 of Regulation 2003/2003</td>
</tr>
<tr>
<td>Trace elements</td>
<td>Inorganic micronutrients listed in part E of Annex 1 to Regulation 2003/2003</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>Only mined salt</td>
</tr>
<tr>
<td>Stone meal and clays</td>
<td></td>
</tr>
</tbody>
</table>
# Pesticides – plant protection products

## 1. Substances of crop or animal origin

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azadirachtin extracted from <em>Azadirachta indica</em> (Neem tree)</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Beeswax</td>
<td>Pruning agent</td>
</tr>
<tr>
<td>Gelatine</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Hydrolysed proteins</td>
<td>Attractant, only in authorized applications in combination with other appropriate products of this list</td>
</tr>
<tr>
<td>Lecithin</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Plant oils (e.g. mint oil, pine oil, caraway oil)</td>
<td>Insecticide, acaricide, fungicide and sprout inhibitor</td>
</tr>
<tr>
<td>Pyrethrins extracted from <em>Chrysanthemum cinerariaefolium</em></td>
<td>Insecticide</td>
</tr>
<tr>
<td>Quassia extracted from <em>Quassia amara</em></td>
<td>Insecticide, repellent</td>
</tr>
<tr>
<td>Rotenone extracted from <em>Derris</em> spp. and <em>Lonchocarpus</em> spp. and <em>Terphrosia</em> spp.</td>
<td>Insecticide</td>
</tr>
</tbody>
</table>

## 2. Micro-organisms used for biological pest and disease control

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro-organisms (bacteria, viruses and fungi)</td>
<td></td>
</tr>
</tbody>
</table>

## 3. Substances produced by micro-organisms

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinosad</td>
<td>Insecticide Only where measures are taken to minimize the risk to key parasitoids and to minimize the risk of development of resistance</td>
</tr>
</tbody>
</table>

## 4. Preparations to be surface-spread between cultivated plants

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferric phosphate (iron (III) orthophosphate)</td>
<td>Molluscide</td>
</tr>
</tbody>
</table>

## 5. Other substances from traditional use in organic farming

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper in the form of copper hydroxide, copper oxychloride, (tribasic) copper sulphate, cuprous oxide, copper octanoate</td>
<td>Fungicide. Up to 6 kg copper per ha per year For perennial crops, Member State may, by derogation from the previous paragraph, provide that the 6 kg copper limit can be exceeded in a given year provided that the average quantity actually used over a 5-year period consisting of that year and of the four preceding years does not exceed 6 kg</td>
</tr>
<tr>
<td>Ethylene</td>
<td>Degreening bananas, kiwis and kakis; Degreening of citrus fruit only as part of a strategy for the preventing of fruit fly damage in citrus; flower induction of pineapple; sprouting inhibition in potatoes and onions</td>
</tr>
<tr>
<td>Fatty acid potassium salt (soft soap)</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Potassium aluminium (aluminium sulphate) (Kalinite)</td>
<td>Prevention of ripening of bananas</td>
</tr>
<tr>
<td>Lime sulphur (calcium polysulphide)</td>
<td>Fungicide, insecticide, acaricide</td>
</tr>
<tr>
<td>Paraffin oil</td>
<td>Insecticide, acaricide</td>
</tr>
<tr>
<td>Mineral oils</td>
<td>Insecticide, fungicide</td>
</tr>
<tr>
<td>Potassium permanganate</td>
<td>Fungicide, bactericide; only in fruit trees, olive trees and vines</td>
</tr>
<tr>
<td>Quartz sand</td>
<td>Repellent</td>
</tr>
<tr>
<td>Sulphur</td>
<td>Fungicide, acaricide, repellent</td>
</tr>
</tbody>
</table>

## 6. Other substances

<table>
<thead>
<tr>
<th>Name</th>
<th>Description, compositional requirements, conditions for use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium hydroxide</td>
<td>Fungicide Only in fruit trees, including nurseries, to control <em>Nectria galligena</em></td>
</tr>
<tr>
<td>Potassium bicarbonate</td>
<td>Fungicide</td>
</tr>
</tbody>
</table>
Feed materials

1. Feed materials of animal origin

Milk and milk products:
- Raw milk
- Milk powder
- Skimmed milk, skimmed-milk powder
- Buttermilk, buttermilk-powder
- Whey, whey powder, whey powder low in sugar, whey protein powder (extracted by physical treatment)
- Casein powder
- Lactose powder
- Curd and sour milk

2. Feed material of mineral origin

Sodium:
- Unrefined sea salt
- Coarse rock salt
- Sodium sulphate
- Sodium carbonate
- Sodium bicarbonate
- Sodium chloride

Potassium:
- Potassium chloride

Calcium:
- Litho amnion and maerl
- Shells of aquatic animals (including cuttlefish bones)
- Calcium carbonate
- Calcium lactate
- Calcium glutonate

Phosphorus:
- Defluorinated dicalcium phosphate
- Defluorinated monocalcium phosphate
- Monosodium phosphate
- Calcium-magnesium phosphate
- Calcium-sodium phosphate

Magnesium:
- Magnesium oxide (anhydrous magnesia)
- Magnesium sulphate
- Magnesium chloride
- Magnesium carbonate
- Magnesium phosphate

Sulphur:
- Sodium sulphate