INDEX

General
1. Purpose
2. Background

Processes applicable to the primary production
3. Seed selection / varieties
4. Crop rotation
5. Plant population establishment
6. Fencing / patrolling / disease and nematodes / vertebrate pests
7. Soil preparation / soil types
8. Fertilising
9. Irrigation
10. Insects
11. Weeds
12. Cutting Schedules
13. Harvest Methods
14. Storage Methods (On farm)
15. Forage Quality
16. Market determination
17. Auditing and responsibility for good practice
18. Labour Code
19. Sustainability code

Processes applicable to the receipt of pressed bales and for double pressing
1. Quality determination ex farm
2. Dispute Procedure
3. Grading process on receipt at press
4. Process flow in press
1. **PURPOSE**

To set up defined parameters within which alfalfa will be cultivated and processed for the export market, thereby creating an audit trail that will satisfy the requirement of all importing countries.

The code will be self-regulating and will be applicable to all parties in the supply chain of alfalfa

Successful implementation of the code will establish South African alfalfa as an approved and premium product in the international markets. This will create a stable long term market to all role players.

2. **BACKGROUND**

The export of alfalfa from South Africa has increased steadily over the past five years. Thus far the focus has been on the Eastern markets with a basic product offering.

In order to fulfil the requirements of the more sophisticated export market a three pronged approach is required:

a. A code regulating primary production methodology.

b. The establishment of an internationally recognised testing methodology that will provide a uniform platform for setting quality platforms (linked to pricing levels): and

c. The establishment of static (double) pressing facilities that will present pressed product to international norm.

**Processes applicable to the primary production**

3. **SEED SELECTION/VARIETIES**

The following seed cultivars are approved for export, namely:

- Any certified seed approved by the National Lucerne trust (NLT) GMO free.
- Type of seed and Dormancy.
- Winter Dormancy:
  - Meaning on a scale of 1 – 10.
  - Where 1 is strongly dormant in the winter (longer lifespan and more for grazing).
  - And where 10 means that the plant is active or not dormant at all. (Very good for hay production).
  - A negative point off a high dormancy Alfalfa plant, can be seen during the rainy season or extensive dew where the regrowth is quicker than the time of drying of the alfalfa already cut, and makes baling conditions difficult where “hot-spots” or wet spots can be detected in the bale.
  - This can influence the quality off the alfalfa.
  - Records must be kept by the producers of the type, date and location of seed planted.

4. **CROP ROTATION**

- Crop rotation is a common practice in South Africa every 4 – 7 years.
- Crop rotation varies depending on the amount off seed used that will have an effect on the health and duration of the plant.
- Crop rotation is applied as soon as the alfalfa yield and quality consistently decrease.
- Good up-keeping practices and fertilising schedules on the alfalfa can will also have an effect on the crop rotation intervals and give your plant a longer life-span.
Note: The producer is required to keep records for five years as to the type of crop cultivated under each irrigation point together with the date of new plantings.

Alfalfa can be ploughed out once your yield is not sufficient and quality starts going down constantly.

5. PLANT POPULATION ESTABLISHMENT

Advantages of high plant population alfalfa plants:
- A higher plant population leads into better hay quality hay than in a lower plant population.
- A higher plant population also suppresses the growth of grasses and weeds. To constantly attain and maintain this you should attend to good cutting frequencies, water management and the right fertilizing program accordingly to a proper soil sample.
- Research data shows lately that a norm of 33-40 kg per hectare for newly planted alfalfa is used, since the plant population will decreases where the more aggressive plants will stool and smaller plants will wither, this results in longer yield with properly managed alfalfa for up to seven years and more.

Note: The producer is required to keep records for five years as to the plant population establishment under each irrigation point together with the date of new plantings.

6. DISEASE AND NEMATODES, FENCING / PATROLLING / VERTEBRATE PESTS AND GOOD PRACTICES

- Tick species are widely distributed around the world, but they tend to flourish more in countries with warm, humid climates, because they require a certain amount of moisture in the air to undergo metamorphosis, and because low temperatures inhibit their development from egg to larva. Ticks of domestic animals are especially common and varied in tropical countries, where they cause considerable harm to livestock by transmission of many species of pathogens and also causing direct parasitic damage.
- For an ecosystem to support ticks, it must satisfy two requirements: the population density of host species in the area must be high enough, and humidity must be high enough for ticks to remain hydrated. Due to their role in transmitting Lyme disease, ixodid ticks, particularly *I. scapularis*, have been studied using geographic information systems (GIS), to develop predictive models for ideal tick habitats. According to these studies, certain features of a given microclimate – such as sandy soil, hardwood trees, rivers, and the presence of deer and livestock – were determined to be good predictors of dense tick populations.
- To secure your Alfalfa from transmitting any disease from unwanted animals, good household practice should be achieved, and by patrolling your alfalfa fields on a regular basis.
- Sheds should be clean and good household practices for rodents should keep ticks and fleas out. By not storing any food for rodents near Alfalfa they will not bread between the bales and because the bales are being moved frequently out of local depot sheds it should keep rodents out.
- Our normal pesticides for lice on Alfalfa also kills tics.

Note: The producer is required to keep records for five years as to describe the practices above under each irrigation point together with the date of new plantings.
7. **SOIL PREPARATION AND SOIL TYPES**

The producer must conduct regular soil checks
- Seedbed preparation is very important and can be done by a roller to secure maximum seed contact
- Water drainage should be done before planting.
- Soil levelling is essential.
- Surface compacting.
- Soil analyses (reference Brookside Manual).

8. **FERTILISING**

- A full program should be implemented throughout the whole season for good quality alfalfa
- A good accurate soil sample e.g. Brookside test should be performed before applying any fertilizer
- By just adding what the Alfalfa plant takes out of the soil according to a leaflet does not represent a specific land needs. Contaminated or poor quality water can drastically change the outcome of quality and the lifespan of Alfalfa.

9. **IRRIGATION**

a. Irrigation can be managed by probes to accurately determine the water profile.

b. Each variety and different dormancy should be managed separately for soil types, water quality, soil temperature plays a role in how much water should be applied.

10. **INSECTS**

- It is very important to apply insecticides to prevent insects to cause long-term negative effect on both yield and quality.
- This contribute in the extinction of the Alfalfa plant and shortens the lifespan of the plant.
- A healthy plant supresses grass and weeds.

The Question is: What it will cost you if you don’t control insects or weeds?

Stay within the law:
Reference NOTICE 511 OF 2008
DEPARTMENT: AGRICULTURE
FERTILIZERS, FARM FEEDS, AGRICULTURAL REMEDIES AND STOCK REMEDIES
ACT, 1947 (ACT NO. 36 OF 1947)
PUBLICATION OF SOUTH AFRICAN POLICY ON ANIMAL FEEDS

Note: The producer is required to keep records for five years as to describe any abnormal activity level of known insects or the discovery of insects not normally indigenous to the area.

11. **WEEDS**

The producer is required to keep records for five years as to describe any abnormal activity level of weeds or the discovery of weeds not normally indigenous to the area.

It is very important for the long-term to control weeds immediately rather do damage control.
It is also advisable to give your Alfalfa plant a **foliar feed** and a **root stimulator** approximately 7 days after applying an herbicide. This will advance the re-growth and allow the plant to its full potential the same cut without compromising on yield.

**Allow enough time between dates of applying your specific herbicide before cutting. Read the leaflet.**

**Stay within the law:**
Reference  NOTICE 511 OF 2008
DEPARTMENT: AGRICULTURE
FERTILIZERS, FARM FEEDS, AGRICULTURAL REMEDIES AND STOCK REMEDIES
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**Basic forbidden Weeds in Alfalfa:**
Dodder: Cuscata and Grammica species – Dodder A plant Parasite
12. CUTTING SCHEDULES

The producer is required to keep records for five years as to the cutting schedules for each irrigation point.

Cutting Frequency and using a Ledger book:
Cutting Alfalfa at specific times is an important factor for determining good quality hay combining it into high yield.
Normally cutting too early results in excellent quality, but yield may be lost, which mean losing money. (Try getting the balance by using a ledger book)
Cutting time advantages:
By cutting later in the morning you gain in the following, namely:

a. By not cutting when there is dew on the ground, this will help the plant dry off sooner.

b. By doing this you do not only save time on the drying process. A study shown that by cutting approximately four hours after sunrise the plant gain its natural sugar reserves (used during the night) trough photosynthesis, this allows better leaf retention with structural carbohydrates and better quality hay.

c. These sugars will increase your quality and yield,

Cutting Height:
It is very important not to cut off the plants re-growth as it will take longer to be ready for the next cut since the re-growth must grow back again.

By cutting it approximately a cigarette box high (just above re-growth) the alfalfa pull away much quicker for the next cut without going through any stress, also suppressing the growth off grass and weeds the same time.

The principal for physiological cutting frequencies is easy:
The plant takes a long time to reach flower in the colder months and goes into flower quickly in the summer months.

You would have to adjust your cutting frequency accordingly to the climate changes to prevent

a. Extensive leaf loss off the lower part off the plant; and

b. To keep out insects

c. To keep out grass and weeds

As soon as your plant reaches its physiological stage of reproduction its stems become thick and woody and flower will start showing. The plant’s stem versus leaf ratio increases, the neutral digestible fibre percentage and acid detergent fibre percentage increases closer to flowering which is a negative reaction to quality hay production.

To find the balance between cutting frequencies for high yield and high quality hay you can use a Ledger book for data. Use the Data for each land each cut. The ideal yield will be reached at an ADF level off about 28 percent.

Cutting too early:
You can determine a low ADF by cutting earlier. Cutting too early will show a ADF off approximately 22 percent, this type off ADF is the result of the first two cuts each year. By documenting the date off cutting you can later determine to cut a week later the following season to aim for higher yield and still attain the best quality.

Cutting too late:
In the warmer months it is exactly the opposite, the plant grows faster and go into philological stage of reproduction quicker. To keep up with good quality and increased yield you may adjust your cutting frequencies accordingly to the ADF results

Then once a year allow flowering to give the plant chance to build up reserves for the winter months and new growing season.
Example of a Ledger book:

Pivot number 1 A Cultivar: ML 99

<table>
<thead>
<tr>
<th>Date of planting:</th>
<th>Mar-15</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Cutting date</th>
<th>Moisture of bale</th>
<th>Average day temperature</th>
<th>Average night temperature</th>
<th>Number of tickets raked</th>
<th>Grading</th>
<th>ADF</th>
<th>NLQI</th>
<th>Yield</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-Sep-14</td>
<td>14.50%</td>
<td>22-26</td>
<td>4-7</td>
<td>4</td>
<td>Prime</td>
<td>22</td>
<td>110</td>
<td>2.2 tons</td>
<td></td>
</tr>
<tr>
<td>10-Oct-14</td>
<td>13.80%</td>
<td>25-36</td>
<td>10-18</td>
<td>4</td>
<td>Prime</td>
<td>25</td>
<td>108</td>
<td>2.7 tons</td>
<td></td>
</tr>
</tbody>
</table>

By using last year’s data you can adjust the cutting period to boost yield and balance quality

<table>
<thead>
<tr>
<th>Date</th>
<th>Moisture of Bale</th>
<th>Average Day Temperature</th>
<th>Average Night Temperature</th>
<th>Number of Tickets Raked</th>
<th>Grading</th>
<th>ADF</th>
<th>NLQI</th>
<th>Yield</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-Sep-15</td>
<td>15%</td>
<td>23-28</td>
<td>5-10</td>
<td>4</td>
<td>prime</td>
<td>26</td>
<td>109</td>
<td>2.5 tons</td>
<td></td>
</tr>
<tr>
<td>20-Oct-15</td>
<td>14.80%</td>
<td>28-38</td>
<td>13-20</td>
<td>4</td>
<td>prime</td>
<td>28.4</td>
<td>105</td>
<td>3.2 tons</td>
<td></td>
</tr>
</tbody>
</table>

Note: These NLQI results is based on a total index on numerous parameters and that the above example is not a given to the NLQI result, but rather an indication off the cutting period accuracy.

13. HARVEST METHODS

Note: A list of all equipment used in cutting and baling needs to be kept

14. STORAGE METHODS (ON FARM)

- Product must be stored in a manner that will ensure the preservation of quality and to restrict the likelihood of contamination of any foreign manner.
- Care must be taken that individual bales are stored or marked in a manner that will preserve the identity back to the irrigation point and date of baling

15. FORAGE QUALITY

Leaf retention:
Leaf retention is the key factor of high quality Alfalfa hay. Baling also affect the quality off the hay. Conditioners can have an effect by letting the plant dry quicker and allowing less raking and handling off wind-rows. Almost 80% off your hay quality comes from your raking method.

Without putting yourself out of pocket a very easy way to improve your rake is to cover the inside off the rake, this allows the alfalfa to stay fluffy, thus helping with the drying process, and possibly reduces the amount off raking and also it keeps the leaf in the windrow. Claims off up to 30% more leaf retention were reported when using this application on the rakes.
16. **MARKET DETERMINATION**

The choice as to the market where the pressed product will be sold is exclusive to the buyer.

17. **AUDITING AND RESPONSIBILITY FOR GOOD PRACTICE**

The producer will allow the buyer to nominate auditors to ensure that the producer abides by the code of practice and will work with the auditor. The cost of the audit will be for the account of the buyer and he will give adequate notice of his intention to do so.

18. **LABOUR CODE**

The producer will ensure the discharge of social, ethical and legal responsibilities and requirements to ensure a healthy and productive working environment in line with all the required legislation in the republic of South Africa.

19. **SUSTAINABILITY CODE**

The producer will ensure the protection and management of all natural resources in a sustainable manner as per the requirement of the Code of Best Practice.

**Processes applicable to the receipt of pressed bales and for double pressing**

**Internal Processes**

a. **Quality determination ex farm**

The quantity and quality will be determined when product is delivered at the buyer’s warehouse. The weighbridge and the NIR machinery will be calibrated annually and the
relevant certificates will be available for inspection. No disputes will be entertained once product have been offloaded.

b. Dispute Procedure
The producer or his representative will receive documentation on delivery stating the quantity and quality of product. If they do not agree with any of the measurement they should not offload but move the truck to a demarcated area and inform a manager of the buyer that they intend to declare a dispute. The National Lucerne Trust will adjudicate any disputes, the cost will be for the losing party. No disputes will be entertained once product have been offloaded.

Grading process on receipt at press
- Each Farmer will receive a delivery book which each load will be accompanied with a written delivery note.
- A NLT method of sampling will be used.
- Proper protocol to the NLT will be executed.

c. Process flow in press:
After receipt product will be stored in separate sheds based on the tested quality. Bales will be taken at the average weight of the net offloaded truck.

Note: A regular update of this document could appear due to regular market climate changes and research appearances.