Development of norms, standards and guidelines including a regulatory framework for the burning of sugar cane in the KwaZulu-Natal Province

By Jay Puckree & Zama Mtembu
Presentation overview

- Objectives of the sugarcane burning policy
- Project deliverables
- Legislative context
- Status Quo Report
- Sugarcane burning guidelines
- Proposed By-law
Project objectives

- To meeting the objectives of AQA as stated in Chapter 1: to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic;
- The Climate Change Response Strategy and the 2010 Green Paper identify sugarcane burning as one of the areas where SA can reduce GHG to meet its obligation to UNFCCC
Project objectives...

- Reduce greenhouse gas emissions in the agricultural sector through the National Department of Agriculture and improve carbon sequestration. Mitigating options that could be considered for the agricultural sector include avoiding the burning of agricultural residues, including those from sugarcane plantations, even where such methods are accepted management practice.
Legislative context

- The Kyoto Protocol
- National Climate Change Response Strategy for South Africa
- Draft National Climate Change Response Green Paper 2010
- Draft Model Air Quality Management By-law
- Notice 309 of 2011 the Draft National Dust Control Regulations, under paragraph (0) of section 53, read with section 32 of the NEM: AQA
Project deliverables

- **Phase 1**: Status quo analysis
- **Phase 2**: Development of procedures and protocols for the burning of sugarcane
- **Phase 3**: Development of framework legislation for the control of sugarcane burning
- **Phase 4**: Development of an Environmental Management Systems audit protocol for regulatory authorities
- **Administrative phase**: Continuous throughout the project
Section 1: Introduction

Section 2: Description of the study area

Section 3: Current sugarcane burning practices

Section 4: Short discussion on airborne influences of sugarcane burning

Section 5: Emission inventory

Section 6: Conclusion
Sugarcane growing in KZN

- The KwaZulu-Natal Province spans an area of approximately 94,000 km², and it is estimated that 391 km² of this area is under sugarcane cultivation found in four regions namely Zululand, Midlands, North Coast and the South Coast.

- According to the South African Sugar Association (SASA), the industry generates an annual estimated average direct income of R8 billion. This constitutes R5.1 billion in value of sugarcane production.
Sugar Industry in KZN
Stakeholders in the industry

Provincial and local government – Enforcement in terms of legislation governing air quality management

- South African Sugar Association
- South African Sugar Millers Association
- South African Cane Growers’ Association
- Local Environmental Committees/Famous
Measures being taken within the industry

- Sugarcane burning policies
- Fire Danger Rating System (FRDS)
- Fire Protection Association (FPA)
- Green Harvesting
- SuSFarMS®
SuSFarMS®

Sustainable sugarcane farm management system

- SuSFarMS (sustainable sugarcane farm management system) is a voluntary self audit tool which was developed and accepted by the South African sugar industry to provide assistance to cane growers in order to operate in a sustainable manner and address areas of legal compliance.

- It is a registered trademark of SASA in terms of section 29 (2) of the Trade Marks Act (1993) under class 16. The SuSFarMS is intended at keeping with the worldwide trends towards sustainable agriculture or eco-agriculture as well as in being inline with South Africa’s policies on agriculture for sustainable development.
The sugarcane industry in South Africa burns 90% of its crop at harvest while 10% is harvested green.

The smuts from fires falling onto sensitive areas, namely residential areas, swimming pools, schools etc.

The smoke from cane fires constituting a hazard to road users and annoyance to the public.

Uncontrolled fires can disruption of power supplies and damage property,
“Green harvesting” is when sugarcane is harvested without prior burning. It involves the cutting of the adult cane stalk, the removal of leaves and unwanted matter and the covering of the plant’s roots with the “trash blanket” (leaves and other residues from harvesting).
Advantages of both methods of harvesting

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Green harvest</th>
<th>Burning</th>
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<tbody>
<tr>
<td>Formation of a trash blanket (ensures preservation of soil moisture and suppresses weed growth and controls pests and improves the condition and nutrient value of the soil due to the organic matter and, under wet conditions, field damage is reduced)</td>
<td>Burning the sugarcane enhances the quality and quantity of the sugar recovered.</td>
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<td>The deterioration in unburnt sugarcane is much slower than in burnt sugarcane, which provides an extra income to the farmer as well as the miller.</td>
<td>Reduces the costs of harvesting, hauling and milling that benefits farmers and consumers.</td>
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<td>Harvesting can proceed earlier because there is no delay for sugarcane to dry before burning and during rainy weather, harvesting unburnt cane may be the only way to deliver cane.</td>
<td>Decreases the volume of material to be processed by the factories.</td>
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<td>Harvesting unburnt cane can protect the environment and the public from the nuisance of smoke pollution.</td>
<td>Reduces wear and tear on field and factory equipment.</td>
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<tr>
<td>Unburnt sugarcane harvesting also has an effect on the harvesting and factory operation.</td>
<td>Shortens the harvest season by as much as 10 percent.</td>
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Disadvantages of both methods of harvesting

<table>
<thead>
<tr>
<th>Green harvest</th>
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<tbody>
<tr>
<td>Disadvantages</td>
<td></td>
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<tr>
<td>Increased harvesting costs.</td>
<td>Burning sugarcane releases carbon dioxide into the air</td>
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<tr>
<td>Increased effort is spent trashing the sugarcane during manual cane harvesting, thus reducing the harvesting productivity due to a slower rate of work involved in trashing.</td>
<td>The smuts from fires onto residential areas, schools etc.</td>
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<tr>
<td>Increased maintenance is required of machinery and the transport costs are increased due to increased leaf in unburnt sugarcane.</td>
<td>The smoke from cane fires constituting a hazard to road users and annoyance to the public.</td>
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<tr>
<td>In wet and cooler regions, the trash blanket keeps the ground cool which in extreme cases may even stop the cane from regrowing, prevents water evaporation, or both and can enhance frost damage.</td>
<td>Disruption of power supplies.</td>
</tr>
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<td>The accident risk is also increased for manual sugarcane cutters, as it is more difficult to see.</td>
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</tbody>
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Airborne influences of burning

- Fine particles typically acidic, containing secondary nitrates, sulphates and organic species are released into the atmosphere. These aerosols are suspected of promoting respiratory disease.
- Children are often more affected by poor air quality caused by sugarcane burning emissions and are more susceptible to asthma-related illnesses, pneumonia and bronchopneumonia than adults because their immune systems and lungs are not fully developed.
Airborne influences of burning….

- It has been established that during sugarcane burning, combustion is incomplete, with the formation of compounds that are not completely oxidized, thus irritating to the respiratory system and, in some cases, carcinogenic.
Burning guidelines

Burning guidelines.docx
Proposed By-law

• Any person who burns sugarcane shall comply, in addition to the burning requirements provisions of the National Veld and Forest Act, 1998 (Act No. 101 of 1998), with the following control measures:
  • the prior written authorisation of the Council has been obtained, which authorisation may be granted by the Council with conditions; and
  • that person has notified in writing the owners and occupiers of all adjacent properties (including surrounding communities within 150 metres) of:
    • the details of the propose are to be burned
    • the reason for the sugarcane burning;
    • the date and approximate time of the sugarcane burning;
Proposed By-law……

• in the event of inclement weather conditions, an alternative date or dates on which the sugarcane burning may occur;
• the right of owners and occupiers (including surrounding communities within 150 metres) of adjacent properties to lodge written objections to the proposed sugarcane burning with the municipality within 7 days of being notified; and
• the administrative fee has been paid to the municipality.'
Summary of roles and responsibilities

Cane Growers
1. Sugarcane burning
2. Resolution of complaints
3. Data for data collation checklist (cane burning data & SuSFarMS audit findings)

Local municipality
1. Attendance at forum meetings.
2. Collation of data for data collation checklist.
3. Collation of complaints report.
5. Communication with the public on complaints.
6. Incorporating information into annual reporting to provincial and national governmental spheres.

Provincial government
1. Development of provincial emission inventory for sugarcane burning.
2. Incorporating information into annual reporting to national government.

Annual report on the following: Data for emission inventory; SuSFarMS audit performance in terms of air quality; Summary of complaints.
Challenges encountered

- Experience of the consultant with the Veld & Forest Fires Act
- Enforcement process of the proposed by-law
- Consultation with SASA (only I&AP)
- No carbon sequestration can be achieved (US EPA 2010)
Thank you