

SHORT COMMUNICATION

ECONOMIC CONTROL OF CYNODON: A THEORETICAL STRATEGY FOR EMERGING SUGARCANE FARMERS

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Abstract

This paper focuses on the economics of reclaiming weed-infested sugarcane and offers a step-wise strategy to increase the area of well-managed sugarcane for emerging farmers. It uses a worst-case weed infestation scenario, where fields have been infested with *Cynodon dactylon* (L.) Pers. (cynodon). Information on input costs and returns calculated from several trials have been used to show that, although a slow process, progress with cynodon control and subsequent yield improvements can be made. Emerging growers often cannot afford to replant a full hectare in one season; two replanting strategies are therefore proposed. Firstly, by scaling down operations so that systematic weed control and replanting one hectare is accomplished in 0.1 ha units. Secondly, by subsequently scaling up control and replanting operations, with a gradual expansion from one hectare to approximately 15 hectares. This is considered by some to be a more viable area for small scale sugarcane production. Planting a dry bean cash crop during the enforced fallow period, and, later, subsidised seedcane were effective in offsetting sugarcane replanting costs. It is concluded that effective cynodon control can be achieved by emerging farmers, without the financial burden of replanting their entire farm in one season.

Keywords: *Cynodon dactylon*, sugarcane, dry beans, emerging farmers

Introduction

Emerging farmers (EF) are an increasingly important sector in the South African sugar industry. Many farmers, however, struggle to achieve economically viable yields due to weed competition, particularly from *Cynodon dactylon* (L.) Pers. (cynodon) infestations.

Current recommendations for cynodon control are summarised in the SASRI Herbicide Guide (Anon, 2010). Most chemicals that control cynodon also harm sugarcane. The best opportunity for control is therefore in fields due for replanting, where more aggressive grass control strategies can be used in the absence of sugarcane (Campbell, 2008). Current recommendations include repeated applications of glyphosate over a long fallow period, before replanting sugarcane using minimum tillage. This fallow land lies unproductive until replanting, but provides an opportunity for growing a broad-leaved green manure or cash crop that will at the same time enhance grass control. Chemical control with glyphosate (360 g a.e./L) in combination with planting dry beans as a cash crop, is proposed as an integrated

pest management strategy to improve the economics of EF farming, and is discussed in this communication.

Many EFs farm on small-scale land units, with an average farm size of one hectare or less (Eweg, 2004). The cost of replanting one hectare of sugarcane (R13 338; SACGA, 2009/2010) is often beyond the financial means of these growers, when tackled in one season. However, if a cash crop is planted on fallow land where cynodon has been controlled, any income generated could help offset replanting costs. Additionally, by gradually expanding the area under well-managed sugarcane, growers could work towards establishing a larger, more viable farming enterprise. This paper is a further development on the work reported by Campbell *et al.* (2010). The objective of this study was to calculate two economic scenarios for EF, using the industry standard glyphosate, for cynodon control.

In the first scenario, cynodon control and crop replanting operations are scaled down to complete replanting of one hectare over more than one season. Here, the effect of using subsidised seedcane and planting a cash crop during the fallow periods (requiring high management input) are used to offset sugarcane replanting costs.

In the second scenario, by subsequently scaling up cynodon control and crop replanting operations, a gradual expansion of one hectare to approximately 15 hectares is achieved.

Materials and Methods

Sugarcane planting costs with minimum tillage for the 2009/2010 season were obtained from SA Cane Growers' Association (SACGA, 2009/2010). These included herbicide costs, with one full cover spray plus two spotspray applications of glyphosate as well as fertiliser and conventional weed control inputs. Costs of planting subsidised seedcane were provided by Gillespie (2009), and dry bean input costs obtained from suppliers after a management programme was provided (personal communication¹). These costs do not include purchase of traditional land, as this is already available to the community.

Calculations were based on reclaiming cynodon-infested land at a rate of 0.1 ha/annum. A yield of 42 tons cane/ha has been recorded in EF fields with poor cynodon control in the North Coast area. This rose to 65.5 tons cane/ha for a grower in the same area with good cynodon control, on a similar soil (unpublished data²).

Figure 1 illustrates the annual replanting strategy for an EF with a total farm size of one hectare. Each year, the cynodon in 0.1 ha is controlled, and this area is replanted. In year 1, income is reduced as the replanted area is removed from sugarcane production for 12 months for effective cynodon control (total farm yield = 0.9 ha x 42 tons cane = 37.8 tons). During year 2, total farm yield = ((0.8 ha x 42 tons cane) + (0.1 ha x 65.5 tons cane)) = 40.15 tons. Each year, the income changes as 0.1 ha cane is progressively controlled and replanted.

¹ A Jarvie, Pannar Seeds (Pty) Ltd, PO Box 19, Greytown, 3250, South Africa.

² F Phewa, SASRI Extension Specialist, Mount Edgecombe, South Africa.

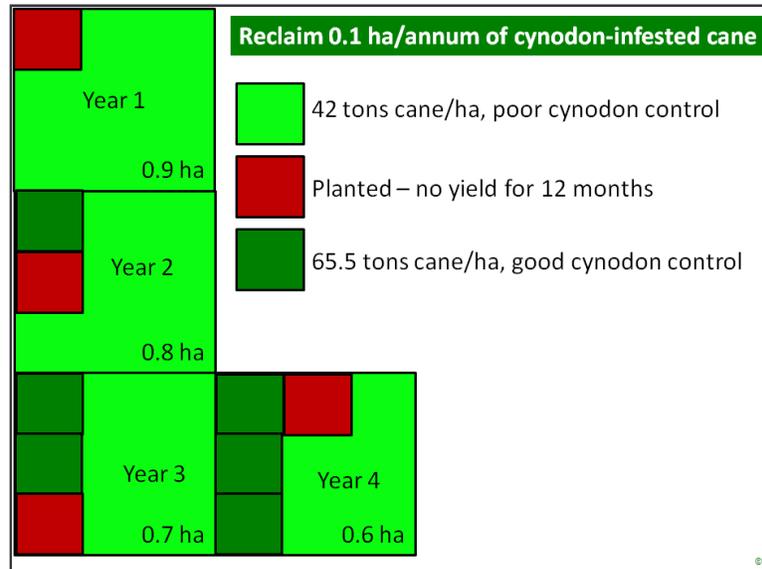


Figure 1. Replanting timetable based on a 0.1 ha replant programme.

Results

Two economic scenarios, based on nett income, are presented to demonstrate the feasibility of EF reclaiming cynodon-infested land. These scenarios are derived using glyphosate (360 g a.e./L) an industry standard registered for use in minimum tillage operations. In both scenarios, there is a loss of income while replanting, due to the lag phase described above.

On the 1 ha scale (Figure 2A), the break-even point, where income equates to a standard poor (cynodon-infested) yield of 42 tc/ha, is reached in year four. Time to achieve this was not influenced on this small scale by using subsidised seedcane, but where dry beans are planted as a cash crop in the replant areas, with a yield of 1.5 t/ha dry beans, break-even point is reached between two and three years. Loss of income could be avoided entirely if a dry bean yield of 3 tons/ha is achieved. Although a high level of management is needed to achieve this yield on 0.1 ha, this is considered possible.

Increasing the area under well-managed cane (with good cynodon control), from 1 ha to 14.8 ha at 65.5 tc/ha, could be achieved in 11 years (Figure 2B). At this larger scale, the impact of using subsidised seedcane was evident. Here, loss of income would be incurred in years 1, 4 and 5 with non-subsidised seedcane, but only during year 1 when subsidised seedcane was planted. Emerging farmers in the South Coast area who have grown their enterprises to 15 ha, report that the first five hectares are the most difficult to manage (personal communication³). The economic model bears this out, since losses occurred up to 4.8 ha, including the 1 ha already reclaimed (Figure 2B).

³ WA Gillespie, SASRI Extension Specialist, Mount Edgecombe, South Africa.

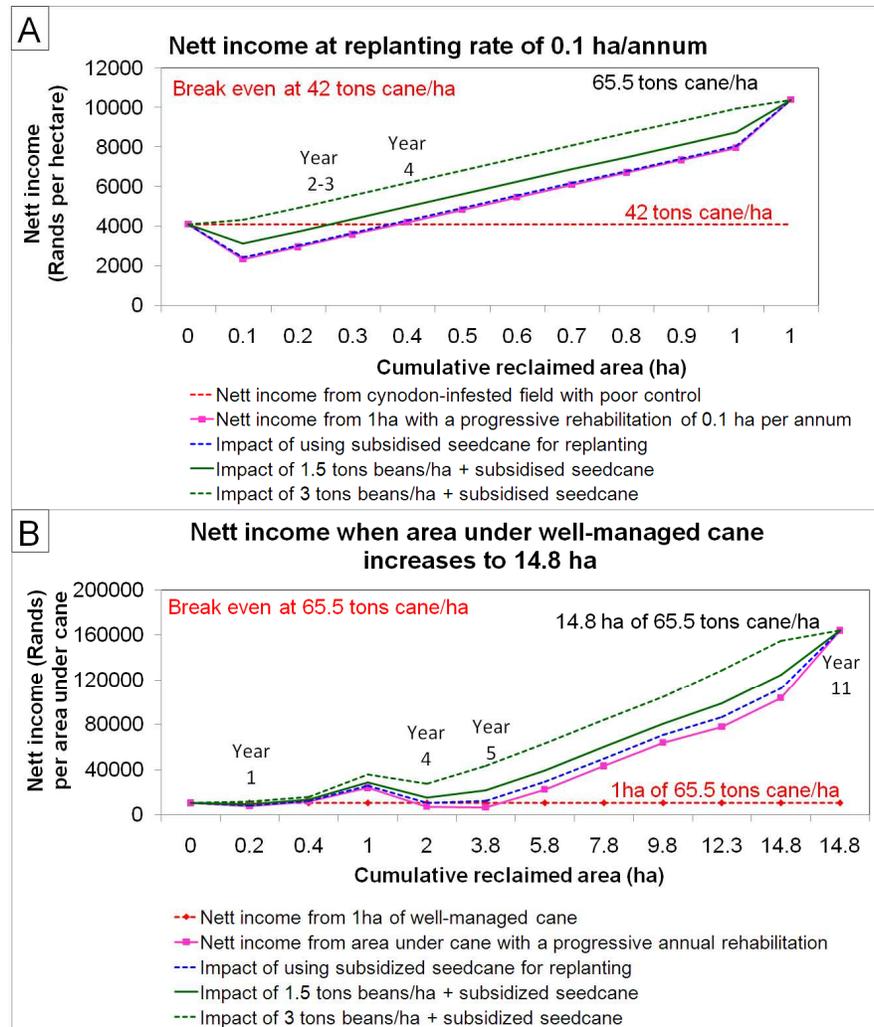


Figure 2. Nett income/ha during replanting: A) Reclaiming and replanting at a rate of 0.1 ha/annum to reach 1 ha replanted, B) Area under well-managed cane expanded gradually from 1 ha to 14.8 ha.

The advantage of the proposed scaling down of replanting operations to 0.1 ha per annum is that experience can be gained in effective cynodon control and bean yields, as well as alleviating the financial burden of sugarcane replanting costs on the entire farm. Additionally, by gradually expanding the area under well-managed sugarcane, growers could work towards establishing a larger, more viable farming enterprise.

Conclusions

- Effective cynodon control can be achieved by emerging farmers.
- Replanting costs can be made more affordable by replanting over a longer period, planting a cash crop and using subsidised seedcane.
- Increasing the area under well-managed sugarcane is feasible, if the land is available. The first 5 ha are the most difficult.

Acknowledgements

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