INTRODUCTION

Sustainability of agricultural production relates to the resources used from and substances emitted into the environment. Sustainability of practices in such a sensitive environment can only be assessed if sustainability criteria and indicators have been defined, which is currently not the case.

The key objectives of this study were to develop principles related to the ecological impact of potato production and derive criteria and indicators of sustainability. From that recommendations can be derived for more sustainable potato production practices. The principles and criteria related to the Sandveld are that the biodiversity (Figure 3) must not be further threatened, fresh water reserves (quantity and quality) must be maintained and emissions of pesticides, minerals and carbon dioxide to the environment must be reduced.

RESULTS

The range of WUEs given by the model was also reflected in the survey outcome (actual yields and irrigation amounts; Figure 5). Grower 4, for example, obtained only 3 g of potato/L water, while grower 10 achieved 12 g/L. Sustainability norms may now be deduced from such data and in this instance could possibly be set at 8 g/L. Final norms should, however, be further debated amongst stakeholders.

Table 1 gives a summary of the survey outcome. Some growers achieved far higher efficiencies, expressed as kg potato produced per unit of input (land, water, biocides, nitrogen and energy) used. According to this, some growers can by intensifying production double their yield, or alternatively restore half of their cleared land area to a natural system, while using less water and other inputs.

CONCLUSIONS

From these results we conclude that there is considerable scope to improve the sustainability performance of potato production in the Sandveld. This is possible by making better use of land, water, biocides and energy (through improved production practices) and capitalising on the prospects of higher future yields, while reducing the production footprint in the Cape Floral Region. Indicators have been quantified to assess sustainability of potato production practices. Norms now need to be set for each aspect, including a threshold below which farming is unacceptably unsustainable and a desired sustainability threshold above which farming is sustainable.

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