A field kit for producers to assess pasture health in the paddock

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ABSTRACT

A pasture health kit has been designed by extension staff, researchers and producers on the North-West Slopes of NSW. The kit consists of a folding quadrat, colour photographs of 20, 40, 70 and 90% ground cover, information on ground cover, runoff, litter and soil microbes, and a field guide for indicators of production and sustainability. The field guide contains a checklist for seven indicators; ground cover, litter, soil surface condition, proportion of productive pasture species, proportion of green and dead herbage, percent legume, and likely animal production. It has two parts; a range of benchmark values for low, medium and high categories for each indicator and a blank sheet to be filled in by marking the most appropriate score (low, medium, high) for each indicator. Indicators with low values highlight components of the pasture system that are in most need of management. Producers have found this to be a useful way of viewing and assessing their pastures in simple, easy to follow parts that they can readily see and score with little training.

KEY WORDS

Field kit, sustainability, production, indicators, producers, assessment.

INTRODUCTION

Increasingly, producers are becoming much more aware of pasture production and sustainability issues as a result of the Sustainable Grazing Systems (SGS) Key Program (6) and initiatives such as PROGRAZE, undertaken by NSW Agriculture (1). Kemp (2) recognised that while producers have traditionally had good animal assessment skills, their skills for soil and pasture assessment were often poorly developed. Scott et al. (8) also suggested that farm management decisions are based mainly on financial criteria rather than soil and pasture health and the consequences of land degradation. Issues of lack of assessment skills have been adequately addressed by producer orientated courses such as PROGRAZE (1), but these require substantial training and refresher courses to ensure skill levels have been attained and retained (e.g. assessment of pasture dry matter production and percent green). Up until now there has been no simple, easy-to-use guide that graziers can use in their paddocks to quickly assess the health of their pasture systems on a paddock basis. Without such a guide it is often difficult for a producer to know how sustainable their pastures are, if their current management is adequate, or what parts of the pasture system need to be improved.

To address these issues a Pasture Health Kit has been developed, initially for pastures on the North-West Slopes of NSW, but the concept can readily be adapted to other areas. Extension experience, focus groups and producer surveys indicate that producers perceived the soil-pasture-animal interaction to be complicated, particularly when combined with variable economic and climatic factors. This perception provides a barrier to producers undertaking a participatory role in understanding and monitoring the production and sustainability of their pastures. Indeed, pastures are complex ecosystems that encompass plants (annual and perennial grasses, legumes and forbs, shrubs and trees), animals (both macro and micro, above and below the ground) and soil, including its formation and loss processes and nutrient content. However, the outcomes of these processes and their interaction with management decisions such as stocking rate, length of grazing period and fertiliser application can often be easily seen in the paddock. Our aim was to produce a guide that reduced the complexity of the system to key indicators that producers could readily identify with and feel confident about assessing, and that they could use on their own properties on a day-to day basis.

It was designed to be used on a paddock basis, require little training or equipment and consisted of a seven-point checklist to score pasture production and sustainability (Table 1) based on simple indicators that a grazier can see and subjectively assess. These include; ground cover, litter, soil surface condition, proportion of green, proportion of productive pasture species, percent legume, and, suitability for animal production. These seven indicators are assessed as having either a low, medium or high score (Table 1). These scores are deliberately designed to be non-threatening to the producer, since there is no right or wrong answer or number to estimate. The kit can be used either individually by producers on their own property or by producer groups as a co-learning exercise.

Table 1. Indicators of pasture production and sustainability in the field guide and notes on the how to assess the levels of low, medium or high. When used in the paddock producers fill in a similar form that has the low, medium and high columns blank.

FIELD GUIDE
INDICATORS OF PASTURE PRODUCTION AND SUSTAINABILITY

Is your pasture producing at its potential, degraded or degrading slowly? This simple checklist will help you monitor
your resource. Assess each pasture on a paddock basis.

INDICATORS	LOW	MEDIUM	HIGH
Ground Cover The minimum on the North-West Slopes of NSW is 70%.	(less than 40%)	(40 - 70%)	(more than 70%)
Litter The unattached plant material laying on the soil surface. Aim for 2 - 3 handfuls per 0.1 sq. metre (1 square foot).	(less than 1)	(1 - 2)	(more than 3)
Soil Surface Hard or soft to the push of your finger or pen.	(no indent)	(small indent)	(soft and easily marked)
Proportion of Productive Pasture Species Desirable species should be more than 60%.	(less than 45%)	(45 - 60%)	(more than 60%)
Proportion of Green Assess on a dry matter basis. Is species and season dependant, aim for more than 60% green in the main growing season.	(less than 20%)	(40%)	(more than 60%)
Proportion of Legume Assess on a dry matter basis. It is seasonal	Native (less than 1%)	(1 - 5%)	(more than 10%)

and species dependent, 10% is high for native pastures, 20% fertilised natives, 40% improved pastures.	Fertilised Native (less than 5%)	(5 - 10%)	(more than 20%)
	Improved Pasture (less than 10 %)	(10 - 30%)	(more than 40%)
Suitability for Animal Production Relate it to the total amount of dry matter, the proportion of green and animal condition (weight gain or loss for sheep or cattle).	(lose weight)	(maintain weight)	(gain weight)

LOW: *If the total of your scores has 3 or more "X's" for LOW sustainability and production then you need to rethink*

your present grazing management to bring the soil and pasture back into a more productive state. Indicators that

score low are the areas that need management input.

MEDIUM: *If most of your scores are in the MEDIUM range, your pasture is in the balance and easily affected by*

over grazing or drought conditions. The pasture is not in bad condition, but concentrate on those indicators with

low or medium scores to improve productivity and sustainability.

HIGH: *If you scored mostly HIG, well done. Your management has achieved a productive and sustainable*

pasture. If you had 1 or 2 low or medium indicators, concentrate on improving these areas. Continue to

monitor the indicators.

The Pasture Health Kit contains coloured photos of different levels of ground cover (20, 40, 70 and 90%); a quadrat to place on the ground and assess the indicators; information on ground cover, litter, runoff and soil micro-organisms, and a field guide to be used by producers. The field guide is in two parts. Firstly, there is a cover sheet that gives a range of benchmark values for low, medium and high categories for each indicator on the seven-point checklist (Table 1). Secondly, there are several blank forms with the same layout as the benchmark sheet that producers fill out by marking the score (low, medium, or high) that they think most applies for each indicator. It is recommended that five to ten quadrats are taken to represent a paddock and that assessments are made throughout the year to determine any seasonal variations, particularly in proportion of green and legume.

The field guide component of the kit was designed from research and extension experience and modified after testing several prototypes with individual producers and producer groups. The importance of ground cover in dissipating raindrop energy and reducing surface runoff of water is well known (e.g. 4). Lang (4) showed that at around a ground cover of 75%, water losses from surface runoff were substantially reduced in northern NSW. Litter is an important component of ground cover and King (3) has reported that litter not only acts as a food supply and living space for decomposer organisms, but also that surface

mulch moderates soil surface temperatures and can reduce evaporation of soil moisture (7). Litter, soil organic matter and high biological activity are also associated with softer, more friable soil surfaces that have high water infiltration rates (5). The relationship between a high green component of the pasture and high animal production is well established (9) and the role of sown legumes in increasing animal production is the basis of pasture improvement in much of the temperate pastoral areas of Australia. Increasingly, maintenance of a high perennial grass component in pastures is also being viewed as beneficial not only for animal production, but also for the amelioration of problems associated with acid and saline soils. Animal production cannot be ignored as an important component of productive and sustainable (economical and ecological) pastures. As such, it has been included in the field guide as a final indicator (Table 1) in an attempt to highlight the importance of the pasture and soil indicators and shift producers focus away from the more traditional 'animocentric' (2) decision making process.

RESULTS

The Pasture Kit has proved to be popular with producers. Two thousand kits were printed and assembled for distribution in spring 1999. These have been distributed both locally and over a wider geographic area initially through the SGS Regional Producer Network, then through field days, Landcare and PROGRAZE groups. It has also been requested as a teaching tool to be used by both secondary and tertiary institutions. Producers have found it to be particularly useful in reducing the complexity of the pasture system into some simple easy-to-follow parts that they can readily see and assess. This provides them with the confidence to undertake monitoring of these indicators on their own properties.

The field guide also allows producers to identify which components of their pastures may be limiting their production and sustainability. They can then focus their decisions and management inputs to help minimise those factors which are clearly the most limiting. Progress towards improving a low scoring indicator can be readily monitored and further advice sought as required. If all indicators are given a high score, then their pastures and management are more than likely to be both productive and sustainable, but they should continue regular monitoring.

CONCLUSIONS

New technologies are often slowly taken up by the grazing industries. To improve the adoption rate different ways of packaging information may have to be used that are both practical and useful for producers. The Pasture Kit, because of the simplicity of the field guide and its practical application has been adopted by producers as the standard assessment tool for the SGS regional demonstration sites on the North-West Slopes of NSW. Producers associated with these sites have been readily able to use the field guide and their results have become the basis for discussions and decisions on management issues.

The Pasture Kit focuses producers on assessing the key indicators of pasture production and sustainability by simplifying the complexities of the pasture ecosystem. It also creates the opportunity for research, extension and producers to interact, by providing a pathway for researchers to update benchmark values for the indicators and for extension personnel and producers to work together to combine this new information into their assessments.

Use of the Pasture Kit also helps meet the overall objective of the SGS program to have 2000 producers across the high rainfall pasture zone of Australia adopt changes to their grazing systems that are more profitable and sustainable.

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