Growth rates of water couch (*Paspalum distichum*) and spike rush (*Eleocharis sphacelata*) in two wetland grazing systems on the North Coast

C Rose [A], H Rose[A] and P Hirst[B]

[A] NSW Department of Primary Industries, Kempsey, NSW
[B] NSW Department of Primary Industries, Grafton, NSW

Abstract: *Wet pasture systems on the north coast can produce large amounts of feed from water couch (Paspalum distichum) and spike rush (Eleocharis sphacelata) in the summer months. The amount of growth is related to temperatures, depth of ponding and monthly rainfall distribution rather than location.*

Key Words: *Wet pasture systems, water couch, spike rush, growth rates, acid sulfate soil*

Introduction

Farmers on the North Coast have long debated the value of wet pasture systems in their fresh water swamps, raising questions such as to how much feed is produced and whether wet pastures perform the same way on other floodplains. The Floodplain Grazing Project sought to address these issues in 2006-07 by measuring the production and quality of two common wet pasture species on Macleay and Clarence floodplains.

Methods

The Macleay study site had been a severe acid sulfate scald until repaired by freshwater ponding in the 1990s, developing dense stands of the native water couch and spike rush. The backswamp study area on the Clarence floodplain was also dominated by these two species, although spike rush was not as dense as at the Macleay site.

Pasture growth rates were calculated from monthly dry matter yield harvests. Yields were measured using 6 pasture exclusion cages for each species in each catchment. Detailed measurement techniques can be found in Rose & Rose, 2005.

Results and Discussion

Water couch produced 12.6 t of dry matter (DM)/ha over its growing season at the Macleay site, growing rapidly during the hottest part of the year (from November to March), with growth rates peaking at more than 100kg/ha/day. Outside this period little growth occurred (Figure 1), a pattern consistent with studies that show growth starts at 10-15˚C, but only becomes rapid above 20˚C and peaks at 30-35˚C (Huang *et al* 1987).

In the Macleay, growth peaked in December and March, (Figure 1) but fell in February when the shallower part of the backswamp (where water couch was being measured) dried out due to low rainfall, resulting in acid sulfate scalding. However, water couch recovered quickly following refilling of the pond in March.

A similar, but differently timed pattern was seen at the Clarence site (Figure 2), with slower growth in January coinciding with hot dry conditions and low water levels. However, this site did not dry out or scald. Unfortunately, cattle tipped exclusion cages over at the Clarence site preventing a December harvest of water couch, so its early summer growth pattern is missing.

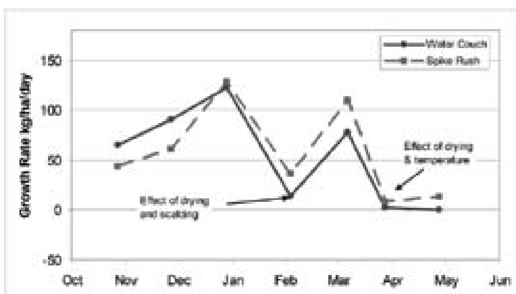

Figure 1: Growth rates of water couch and spike rush at the Macleay site

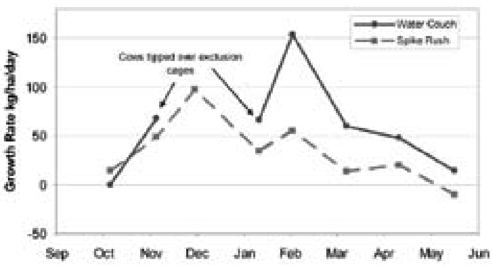

Figure 2: Growth rates of water couch and spike rush at the Clarence site

Spike rush produced 8.1 t and 13.3 t DM/ha over its growing season at the Clarence and Macleay sites respectively. It had similar growth patterns to water couch at both sites, indicating a similar response to water and temperature. At both sites the growth of spike rush was slower than water couch in the spring, possibly indicating a higher minimum temperature requirement for growth. After this period, spike rush grew faster than water couch in the Macleay, but this was at least partially due to the scalding of the water couch area, but not the spike rush area. By contrast, spike rush grew more slowly throughout the summer than water couch (based on area) in the Clarence. This was not unexpected due to the sparser stands of spike rush at this site.

Previous year's growth data has been collected from the Macleay site (Rose & Rose 2005) with both growing seasons having different growth patterns. This data and the 2006/07 growth patterns at both sites indicate that temperatures, depth of ponding and monthly rainfall distribution all interact to determine the growth rates of water couch and spike rush. Maximum growth was achieved during the hottest months when ponded water was present and/or heavy rainfall occurred.

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