

The dry matter yield and nutritive value of wet tolerant tropical forage legumes in single cropping or mixed cropping with gramineous forage crops in drained paddy field

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Introduction In Japan the production of rice has been controlled since the 1970's and some parts of the paddy fields have been laid off for forage production. However, in poorly-drained fields or fields with high ground water table, forage species with high tolerance of wet conditions are required. The tropical forage legumes *Aeschynomene americana* cv. Glenn (Glenn) and *Macroptilium lathyroides* (L.) Urb. cv. Murray (phasey bean) have a high wet endurance (Bishop *et al.*, 1985; Tobisa *et al.*, 1999) and show high dry matter productivity (Skerman *et al.*, 1988; Tobisa *et al.*, 1999). The objective of this experiment was to evaluate the dry matter yield and nutritive value of Glenn and phasey bean in single cropping or mixed cropping with gramineous forage crops in drained paddy fields.

Materials and methods The experiment was conducted in a drained paddy field adjoining a rice paddy field at the Kyushu University Farm. Tropical forage legumes (Glenn and phasey bean), gramineous forage crops (Japanese barnyard millet (cv. White panic and Aoba millet), maize (cv. Snow dent 123) and sorghum (cv. Ultra sorgo)) were used. On 23 June, the paddy field was sown at 2kg/ha in rows with a distance of 50 cm between rows with alternate row sowings of the legume and the gramineous forage crop. Plants were harvested on 2 and 22 September and 18 November (data not shown), and measurements made for dry matter yield (DMY), *in vitro* dry matter digestibility (IVDMD) (Goto & Minson 1977) and crude protein (CP). Digestible dry matter yield (DDMY) and CP yield (CPY) were calculated.

Results Dry matter yield of the single-cropped Glenn was similar to that of the single-cropped sorghum when cut on 22 September and on 18 November. The DDMY of Glenn-sorghum mixed crop was higher than that of the single-cropped sorghum when cut on 22 September. The mixed crops of forage legumes and gramineous forages showed higher total CPY compared with the single crop of gramineous forage when cut on 22 September.

Conclusions The results of the present study demonstrated that Glenn has a high DMY, DDMY and CPY. The mixed crop of forage legume with a gramineous forage with high wet tolerance provided a good forage production system for the drained paddy field.

References

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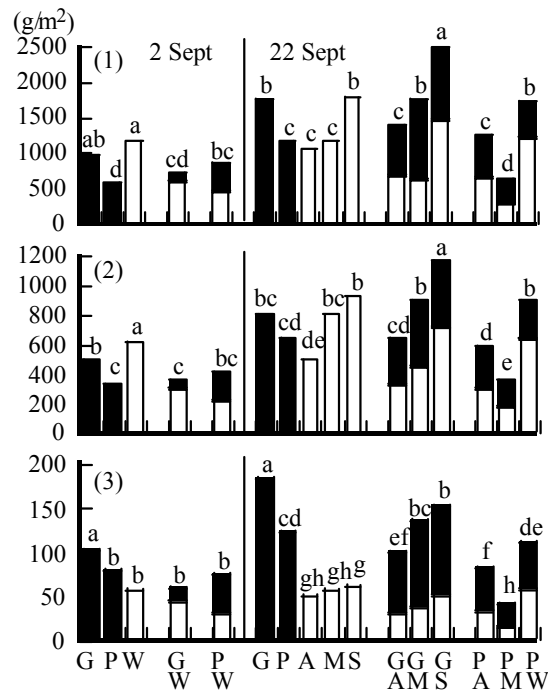


Figure 1 Dry matter yield (DMY,1), digestible dry matter yield (DDMY,2) and crude protein yield (CPY,3) of single and mixed crops in the drained paddy field

G: Glenn, P: Phasey bean, W: White panic, A: Aoba millet, M: maize, S: Sorghum.

The values followed by different letters are significantly different at $P < 0.05$ at each sampling time.

■ : Legume, □ : Gramineous forage.