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Presenter Information

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Adaptability of dwarf napiergrass to smallholders of beef cows in southern Kyushu , Japan

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Key words : dwarf napiergrass , overwintering ability , pasture management , yield

Introduction The northern border of the tropical grass cultivation as a perennial is located in the southern Kyushu of Japan , since the tropical grasses are inevitably suffered from the frost damage several times in a wintering season . However , the progress of aging in smallholders of beef cows needs to gain the sustainable perennial grass cultivation , instead of the annual forage crop production , typically such as maize-Italian ryegrass cropping . Dwarf-late (DL) napiergrass was assessed as the new promising tropical grass in Miyazaki , southern Kyushu (Ishii et al . , 2005) , while the adaptability of this grass to the several sites in these areas remains to be uncertain . This study was conducted to evaluate the adaptability of DL napiergrass to southern Kyushu , by cultivating this grass at several sites with different climatic conditions for 2-5 years after establishment .

Materials and methods Dwarf-late (DL) napiergrass pastures , established by transplanting at 2 plants/m² (50 cm × 100 cm) , were set on 5 sites (Miyazaki , Minamata , Amakusa , Koshi and Shimabara) in May 2002-2005 . Herbage yield was determined for 6 plants per site by cutting plants at 10 cm above the ground level for the first defoliation by cutting and/or grazing each year , and overwintering ability was determined in June of the following year . Climatic conditions in the wintering season were obtained from the meteorological observatory near the site .

Results and discussion The first cutting can be conducted at 89-98 days after the establishment , when the plant height reached to 111-132 cm . The first-cut plants varied considerably in herbage yield and percentage of leaf blade at 226-717 gDM/m² and 61-87% , respectively , based on the early pasture management such as the prompt weeding and fertilization (Table 1) . Under the rotational grazing , herbage yield tended to increase with the year from the establishment . Overwintering ability of dwarf napiergrass shows the threshold response to the lowest temperature of the wintering season , where the critical temperature ranged-6.2 to-7.5°C , under the rotational grazing and/or cut-and-carry systems (Figure 1) . Thus , the perennial use of dwarf napiergrass can be applied to the areas where the minimum temperature of a winter has never dropped below-6°C and the pasture should avoid from the continuous grazing in southern Kyushu .

Table 1 Plant characters in the first defoliation and climates at 5 sites of southern Kyushu .

Character	Site				
	Miyazaki	Minamata	Amakusa**	Koshi**	Shimabara
Days after establishment	98	93	95	101	89
Plant height (cm)	132	111	99	142	128
Tiller number (No./m ²)	34.8	43.0	41.6	41.0	50.3
Herbage mass (g DM/m ²)	427	293	226	576	717
Percentage leaf blade	65.6	87.0	74.2	63.4	60.8
Pasture management*	RG	RG	CG	CC	CC
Lowest minimum temp. (°C)	-3.9	-2.9	-3.1	-7.5	-1.6

* Management : Rotational grazing (RG) ; Continuous grazing (CG) ; Cut-and-carry (CC) .

** : Measured in the second year after establishment .

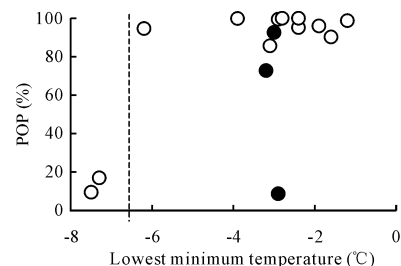


Figure 1 Relationship between percentage of overwintered plants (POP) and the lowest minimum temperature at 5 sites of southern Kyushu .

○ : rotational grazing or cut-and-carry systems , ● : continuous grazing . Data were obtained from 5 sites in the winter from 2002 to 2006 .

Reference

Ishii , Y . , Mukhtar , M . , Idota , S . , Fukuyama , K . , 2005 . Rotational grazing system for beef cows on dwarf napiergrass pasture oversown with Italian ryegrass for 2 years after establishment . *Grassland Science* , 51 , 223-234 .