

EFFECTS OF PLANTING DATES ON FIELD EMERGENCE AND FORAGE YIELD OF SUDANGRASS AND SORGHUM

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ABSTRACT

Sudangrass (*Sorghum sudanense*) and sorghum (*S. bicolor*) are annual forage species with ratoon growth. Objectives of this experiment were to determine the effects of planting dates on field emergence and forage yield of sudangrass and sorghum. Sudangrass and sorghum were planted monthly from mid-March to mid-October in 1994 and 1995, respectively. Emerged plants were recorded daily. Surviving seedlings were determined 2 weeks after emergence. Emergence percentages of sudangrass ranged from 61.7% to 90.6% and those of sorghum ranged from 47.5% to 81.3% in 1994. All the surviving percentages were above 90% for both sudangrass and sorghum in 1994. The emergence percentages of sudangrass ranged from 64.1% to 86.1% and those of sorghum ranged from 73.4% to 86.7% in 1995. The surviving percentages of sudangrass were between 77.7% and 95.7% and those of sorghum were between 88.5% and 100%, respectively. Sudangrass produced more forage yield than sorghum did. The forage yield was the highest planted in March among months in both 1994 and 1995. It was suggested that sudangrass should be planted before May to obtain higher forage yield.

KEYWORDS

Sudangrass (*Sorghum sudanense*), sorghum (*Sorghum bicolor*), planting date, field emergence, forage yield

INTRODUCTION

Sudangrass (*Sorghum sudanense*) is an annual forage crop with ratoon growth and produces high forage yield in Taiwan. It can be cut 70-80 days after emergence to feed dairy cows as green chop or silage (Hsu and Hong, 1995). It is important to learn optimal planting dates to obtain higher forage yield. Objectives of this study were to determine the effects of planting dates on field emergence and forage yield of sudangrass and sorghum (*S. bicolor*).

METHODS

Sudangrass, CV. Taishi No.1 and sorghum, CV. Taichung No.5 were planted monthly from mid-March to mid-October in both 1994 and 1995. Emerged plants were recorded daily. Surviving seedlings were determined 2 weeks after emergence. Emergence percentage, surviving percentage and emergence rate index (ERI) were determined. The ERI was calculated as the summation of the emergence percentage at each counting date divided by the days after planting (Hsu and Nelson, 1986). Forage yield was determined whenever the plants were cut at optimum stage. Temperature and precipitation data were taken at the weather station near the experimental field. The split-plot design with 4 replications and planting date as main plot and species as sub-plot was used.

RESULTS AND DISCUSSION

The emergence percentages of sudangrass were between 61.7% and 90.6% with average 78.5% in 1994 and those were between 64.1% and 86.1% with average 78.0% in 1995, respectively (Fig. 1). The emergence percentages of sorghum ranged from 47.5% to 83.1% with average 73.3% in 1994 and those ranged from 73.4% to 87.5% with average 81.4% in 1995, respectively. The low emergence percentages of sorghum planted in June, 1994 and both species planted in June, 1995 might be caused by low rainfall. The surviving percentages of sudangrass in both 1994 and 1995 were above 90% except those planted in June and July in 1995 (Table 1). The surviving

percentages of sorghum were higher than those of sudangrass in both 1994 and 1995 (Table 1).

The ERIs of sudangrass were the highest when the crop was planted in May in both 1994 and 1995 (Table 1). Thus, sudangrass should be planted before May to get better and faster emergence. The ERIs of sorghum were higher when the seeds were planted in the summer months. The higher summer temperatures would help seedlings emerge faster. Both sudangrass and sorghum produced the highest forage yield when planted in March among planting dates in 1994 and 1995 (Fig. 2). The plants planted earlier could be cut more times before temperature was too low to grow in winter. Thus, the plants could produce more forage yield when planted earlier. Sudangrass produced more forage yield than sorghum did even though sorghum had a shorter cutting interval. It was suggested that sudangrass should be planted before May to obtain higher forage yield.

REFERENCES

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Table 1

Effects of planting date on surviving percentages and emergence rate indices of sudangrass and sorghum in 1994 and 1995.

Planting date	Surviving percentage (%)				Emergence rate index (%/day)			
	Sudangrass		Sorghum		Sudangrass		Sorghum	
	1994	1995	1994	1995	1994	1995	1994	1995
March	93.3 ^{ab*}	95.5 ^a	95.6 ^{ab}	89.4 ^b	7.82 ^d	11.68 ^d	7.04 ^d	10.93 ^c
April	93.6 ^{ab}	95.0 ^a	95.7 ^{ab}	91.3 ^b	19.32 ^{bc}	21.13 ^{bc}	12.05 ^c	24.25 ^{ab}
May	96.3 ^{ab}	91.4 ^{ab}	97.5 ^{ab}	98.7 ^{ab}	28.48 ^a	28.35 ^a	23.30 ^a	27.18 ^a
June	92.0 ^{ab}	84.0 ^{bc}	94.5 ^b	93.3 ^{ab}	21.83 ^{ab}	19.93 ^c	11.82 ^c	21.83 ^b
July	91.4 ^b	77.7 ^c	97.4 ^{ab}	88.5 ^b	17.90 ^{bc}	25.80 ^{ab}	24.33 ^a	27.45 ^a
August	98.9 ^a	95.7 ^a	93.2 ^{ab}	100.0 ^a	24.23 ^{ab}	25.41 ^{ab}	23.50 ^a	25.65 ^{ab}
September	97.0 ^{ab}	93.6 ^{ab}	99.3 ^a	99.4 ^a	17.11 ^{bc}	25.79 ^{ab}	18.96 ^a	27.06 ^a
October	90.1 ^b	90.7 ^{ab}	97.9 ^{ab}	98.3 ^{ab}	13.77 ^{cd}	26.79 ^a	13.91 ^c	24.23 ^{ab}
Mean	94.1	90.4	96.4	94.9	18.81	23.11	16.86	23.57

* Means with the same letters in the same column are not significantly different at 5% level.

Figure 1

Emergence percentages of sudangrass and sorghum planted in different months in 1994 and 1995

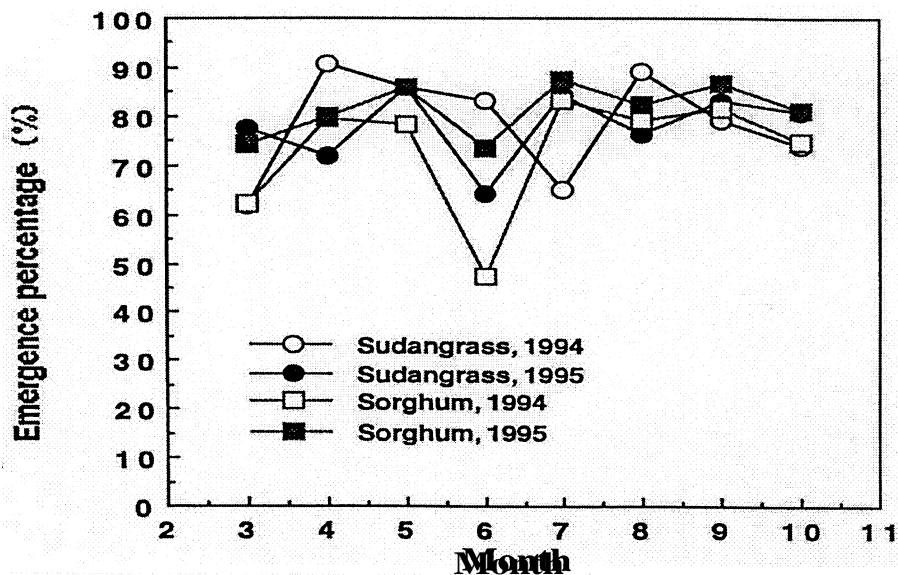


Figure 2

Fresh weights of sudangrass and sorghum planted in different months in 1994 and 1995.

