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IMPROVEMENT OF DIPTEROCARP FOREST PASTURE

REPORT NO. 2
AN OBSERVATION ON THE ADAPTABILITY OF FORAGE SPECIES UNDER DIPTEROCARP FOREST CONDITIONS

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ASRCT, BANGKOK 1973
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By Prapandh Boonklinkajorn* and Soonthorn Duriyaprapan*

SUMMARY

Thirty species of forage crops were subjected to a preliminary trial to study their adaptability under dipterocarp forest conditions. The trial was carried out at ASRCT Sakaerat Experiment Station in Pak Thong Chai, Nakhon Ratchasima from June 1971 to October 1972. The study revealed that Digitaria longiflora (Retz.) Pers., green panic, guinea, hamil guinea, Napier, ruzi, two varieties of signal, zacate of the grass species stylo (var. Q 8558) of the legume species showed satisfactory adaptability to such conditions.

INTRODUCTION

Livestock industry development is one of the greatest opportunity in agricultural expansion in Thailand. An estimate shows that there are about 5.7 million buffaloes and 4.7 million cattle scattered in all parts of Thailand, the most concentration being in the northeast (Brooks 1961). Most of the animals are part of the farming system and feed themselves by grazing on native forage species growing in uncultivated area. Crop residues after harvest are also fed to the animals. One important problem in livestock development is the feed and feeding aspect. In Thailand there is no significant improved pasture; a few meadows exist but generally of very poor quality. It is necessary to establish a good quality grassland, or the natural grassland must be improved in forage quality and carrying capacity. In the north-eastern region, dipterocarp forests are widely covered with ya-phet (Arundinaria pusilla). The grass, which eventually dominates the natural grassland, has poor nutritive value for livestock feeding (Manidool and Tosakun 1972).

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It is necessary to improve such a grassland if the livestock industry of this region is to be developed. The improvement of the natural grasslands would, no doubt, involve adaptive forage materials of better quality supplementing or substituting the existing herbage.

The investigation, the results of which are presented here, was conducted at ASRCT Sakaerat Experiment Station, Pak Thong Chai, Nakhon Ratchasima, from June 1971 to October 1972. The place of study, 383 m above mean sea level, lies at latitude 14°30' N and longitude 101°55' E. The main objective of the study was to examine the adaptability of several forage species under dipterocarp forest conditions of the northeastern region.

MATERIALS AND METHOD

Thirty species of forage crops, 24 grasses and 6 legumes, were grown in a dipterocarp forest. The soil was naturally covered with ya-phet (bamboo grass). Planting plots were cleaned and prepared a week before planting. The study involved the following materials and method.

Grass species

1. African star grass (*Cynodon plectostachyus*)
2. Alabang-X (*Dichanthium aristatum*)
3. Bahia grass (*Paspalum notatum*)
4. Blue panic (*Panicum antidotale*)
5. Buffel grass (*Cenchrus ciliaris*)
6. Coastal Bermuda (*Cynodon dactylon*)
7. Columbus grass (*Sorghum almum*)
8. Dallis grass (*Paspalum dilatatum*)
9. *Digitaria longiflora* (Retz.) Pers.
10. Green panic (*Panicum maximum* var. *trichoglumes*)
11. Guinea grass (*Panicum maximum*)
12. Hamil guinea (*Panicum maximum*)
13. Hybrid Napier (*Penisetum purpureophoides*)
14. Mauritius (*Panicum purpurascens*)
15. Molasses grass (*Melinis minutiflora*)
16. Molopo buffel (*Cenchrus ciliaris*)

17. Napier grass (Penisetum purpureum)
18. Pangola grass (Digitaria decumbens)
19. Ruzi (Brachiaria ruzzeinensis)
20. Signal (Brachiaria brizantha)
21. Signal (Brachiaria decumbens)
22. Taiwan (Digitaria sp.)
23. Thin Napier (Penisetum setosum)
24. Zacate (Digitaria sp.).

Legume species

1. Alice clover (Alysicarpus vaginalis)
2. Centrosema (Centrosema pubescens)
3. Dolichos (Dolichos lablab)
4. Perennial soybean (Glycine wightii)
5. Stylo (Stylosanthes guyanensis var. Q 8558)
6. Townsville stylo (Stylosanthes humilis var. Gordon).

Planting date

9 June 1971.

Plot size

2 x 5 m.

Fertilizer

Nil.

Experimental

Single plot observation.

Measurement.

Adaptability of the fodder crops was evaluated by visual scoring, 0 to 10 points at each time of checking. Those of normal growth were given 10 points and those of the poorer growth received lower points. The dead species received 0 point.

RESULTS

Degree of adaptability was visually measured by the growth of the species at the time of checking. The results are given in Table 1. The monthly rainfall during the period of study is shown in Figure 1.

TABLE 1. Adaptability of forage species under dipterocarp forest conditions.

Forage species	1st check 22 August 71	2nd check 24 March 72	3rd check 17 August 72	4th check 5 October 72
Grasses				
1. African star grass	2	0	0	0
2. Alabang-X	5	1	3	2
3. Bahia grass	6.5	2	2	3
4. Blue panic	3	0	0	0
5. Buffel grass	5	4	4	4
6. Coastal Bermuda	2	0	0	0
7. Columbus grass	10	2	1	0
8. Dallis grass	4	0	0	0
9. Digitaria longiflora (Retz.) Pers.	8	4	6	7
10. Green panic	5.5	6	5	6
11. Guinea grass	10	6	6	8
12. Hamil guinea	9	6	6	8
13. Hybrid Napier	0	0	0	0
14. Mauritius	5	1	1	0
15. Molasses grass	2	4	4	5
16. Molopo buffel	6	4	4	4
17. Napier grass	9	6	6	6
18. Pangola grass	10	4	5	5
19. Ruzi	10	6	6	7
20. Signal (erect)	5.5	6	6	7
21. Signal (decumbent)	5	2	1	0
22. Taiwan	5	2	1	0
23. Thin Napier	3	2	6	6
24. Zacate	10	5	5	7
Legumes				
1. Alice clover	7	0	0	0
2. Centrosema	10	6	4	5
3. Dolichos	10	0	0	1
4. Perennial soybean	5	2	2	1
5. Stylo (var. Q 8558)	8	10	8	8
6. Townsville stylo (var. Gordon)	5	0	1	0

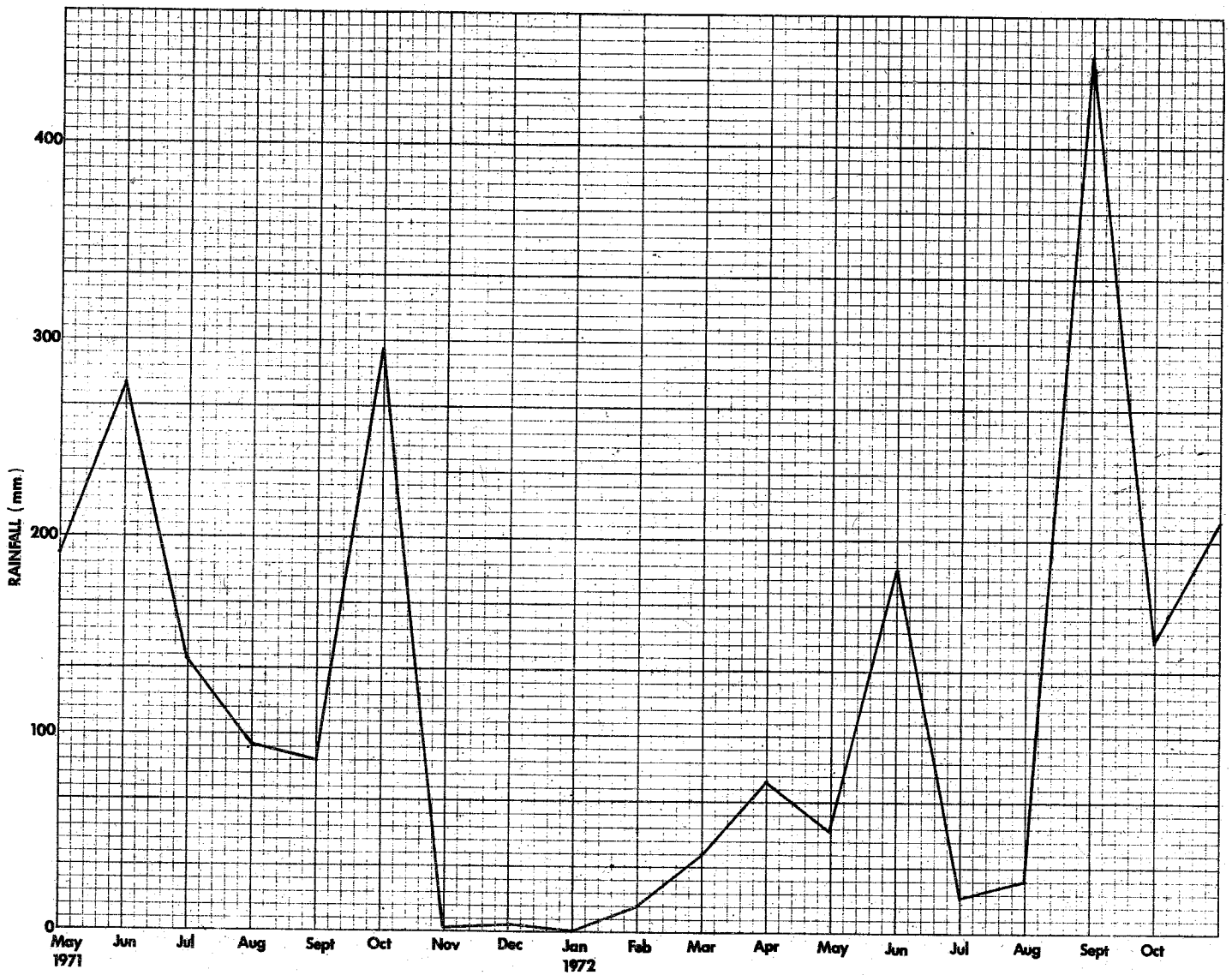

Figure 1. Monthly rainfall 1971-1972.

Planting was done during the rainy season; there was actually adequate moisture for plant growth. The first check in August 1971 indicated that most forage crops grew satisfactorily. The second check made in March 1972 showed distinct variation of adaptability and drought resistance of forage species. The last two checkings further demonstrated their recovery from the suppression due to drought in the cold and summer seasons. Certain species showed remarkable capability of recovery. They were common guinea, Hamil guinea, ruzi, zacate, Digitaria longiflora (Retz.) Pers., signal (decumbent type), signal (erect type), Napier, thin Napier, green panic, pangola, molasses, stylo (var. Q 8558), and centrosema (Table 1).

It was noted that Alice clover was heavily grazed by rabbits and never got a chance to recover.

Soil analysis indicated low fertility with 2.27% organic matter, 1.7 ppm phosphorus, 186 ppm potash, and pH value of 5.5.

DISCUSSION

The soils of natural grasslands of northeastern region have no doubt variable plant nutrient supply. The soil of the experimental plot was comparatively low in fertility, and no fertilization was given to the forage species under study. Certain species may give better performance if fertilized or grown in fertile grasslands.

It should be noted that dolichos and Townsville stylo are annual species in which self-seeding is common, especially in the latter. They should have done better recovery in the second year. A possible explanation was that their seeds were damaged or eaten by animals.

ACKNOWLEDGEMENT

We wish to express our sincere appreciation to Mr. Chanchai Manidool of the Department of Livestock Development who supplied most of the forage species used in this study.

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