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EFFECTS OF BURNING AND GRAZING ON NATIVE SAVANNA IN THE COLOMBIA EASTERN PLAINS (CARIMAGUA)

Haruo Hayashi

OBJECTIVE

To investigate the effects of burning and grazing on seasonal changes of native savanna vegetation in the Colombian Eastern Plain.

Native South American savanna plays an important role in animal production, but it remains low in utilization and productivity. In order to develop the savanna for agricultural use, it is necessary to understand several characteristics of savanna under various management practices.

This report summarizes preliminary information of the processes and causes of succession of *Trachypogon vestitus* savanna and *Paspalum pectinatum* savanna after burning and grazing at Carimagua.

METHOD

Experiments were conducted on a *P.pectinatum* savanna with a 1-ha protein bank of *Desmodium ovalifolium*. The stocking rates were 0.2 (low), 0.4 (medium) and 0.6 animals/ha (high), without burning and 0.2 an/ha with burning on 1 December, 1981.

Another experiment was conducted on a *Trachypogon vestitus* savanna with a 0.2-ha protein bank of *Pueraria phaseoloides* and a stocking rate of 0.25 an/ha at low and 0.5 an/ha at high levels, respectively.

The last burning of the three sections of each plot was conducted on March 1981, 1 December1981 and 15 March 1982, respectively.

The line intercept method was used to measure plant coverage, duration of bare land, and frequency and density of each species on each twenty 1-meter line placed on the permanent diagonal line of each plot. Plant height denoted by the longest green leaf of grasses and erect types or by the natural height of prostrate and vine types was measured on each species. Then the SDR (Summed Dominance Ratio) proposed by M. Numata and K.Yoda (1957) was calculated as follows:

$$SDR = (C' + H')/2$$

Where C' is the cover ration calculated by $100\ N_i/N_{max}$ and H' is the height ratio calculated by $100\ N_i/N_{max}$ and where N_i is the total coverage or height of each species and N_{max} is the maximum total coverage ir height of the dominant one. SDR signifies the relative dominancy of each species on each grassland at each time.

SUMMARY

1. Plant coverage trended to be higher on the burned plot than on the unburned plots. Under burning conditions plant coverage was higher at the high stocking rate than at the low stocking rate. Plant coverage was higher on the burned plot at the beginning than at the end of the dry season, because of the high percentage of under-layer plant which was below 15 cm.
2. The area of bare land was higher on the unburned plots than the burned plot because litter and standing dead litter disturbed new emergence or new establishment.
3. Burning and grazing did not affect the number of emergent species.
4. *T.vestitus* predominated after burning on the low stocking rate in the *P.pectinatum* savanna. Coverage of *T.vestitus* returned rapidly based on increasing of density and frequency. Tillering habit seems to be related to the resistance to burning.
5. *P.pectinatum* predominated on all unburned plots and on the burned plot before burning in the *P.pectinatum* savanna.

When burning at the beginning of the dry season was combined with a high stocking rate, the SDR of *T.vestitus* decreased and more markedly in *P.pectinatum* on the *T.vestitus* savanna.

6. *Leptocoryphium lanatum* codominated on all plots of both burned and unburned savannas. Burning time did not affect the SDR of *L.lanatum* but it declined with time during the rainy season because of another dominant species growth.
7. *Andropogon bicornis* seems to be resistant to burning but to be sensitive to grazing intensity.
8. *A.selloanus* is very stable under burning and grazing condition.
9. *A.brevifolius* was not affected by burning because it had matured at the beginning of the dry season as it is an annual plant.
10. *Panicum* spp. was affected by burning combined with the high stocking rate, so it SDR decreased.
11. There were several legumes on both the observed savannas but all were minor species of each community.
12. It seems that the effects of burning time are complicated by the distribution of main species along the sites where there may be some gradual change of soils.

These observations will be continued to clarify the savanna characteristics and to determine a certain relationship between SDR and productivity of native savanna under different management conditions. This information will be very valuable to be able to predict changes in the vegetation succession associated with utilization that might affect the stability of the floristic composition of the native pastures; or deteriorate the dominance of the good quality species.

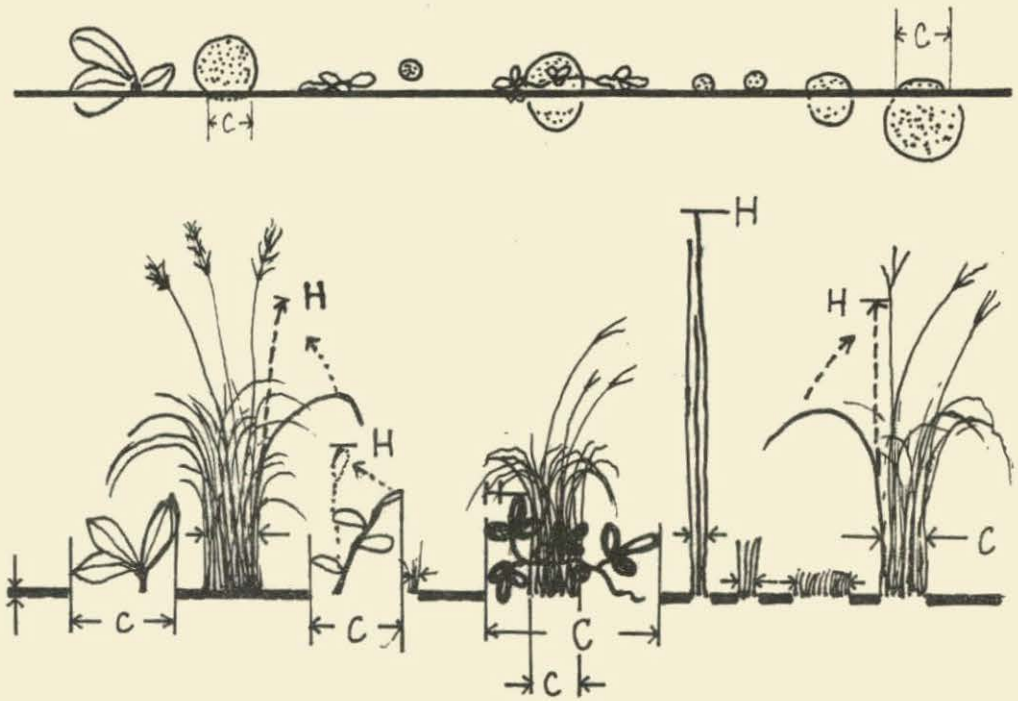

Figure 1. Measuring method of plant height and coverage

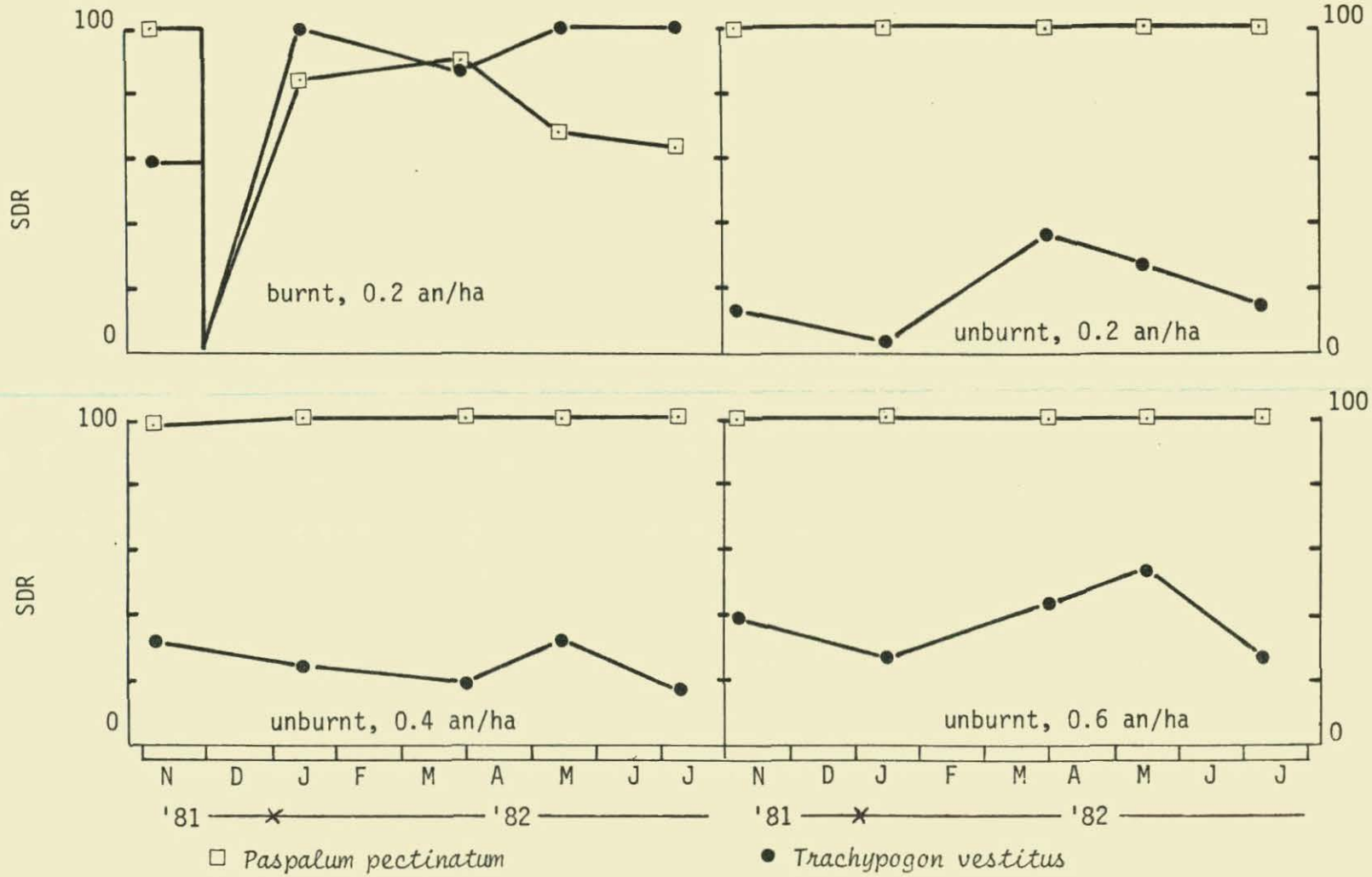

Figure 4. Seasonal changes of the SDR of *Paspalum pectinatum* and *Trachypogon vestitus*

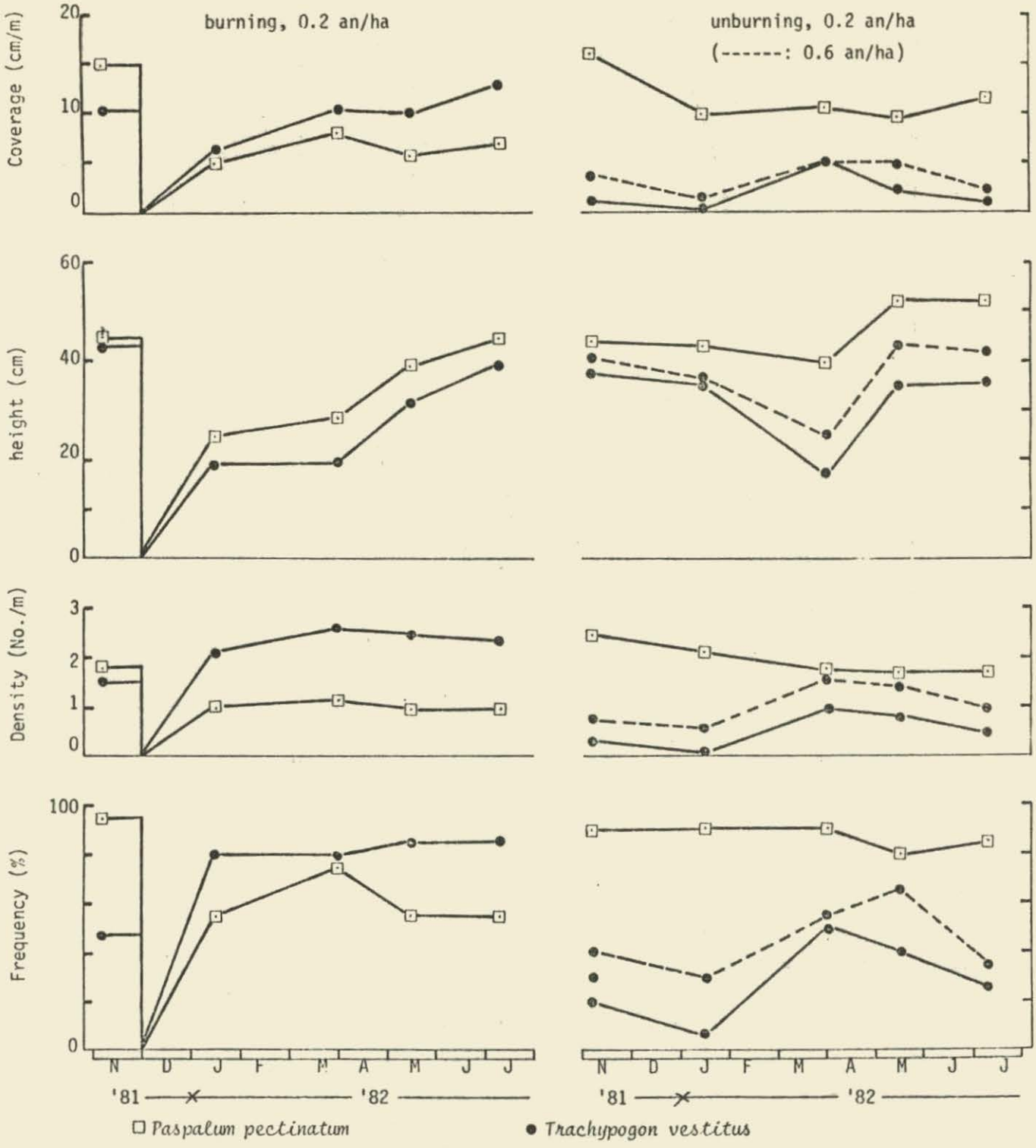

Figure 6. Seasonal changes of coverage, plant height, density and frequency of *Paspalum pectinatum* and *Trachypogon vestitus*

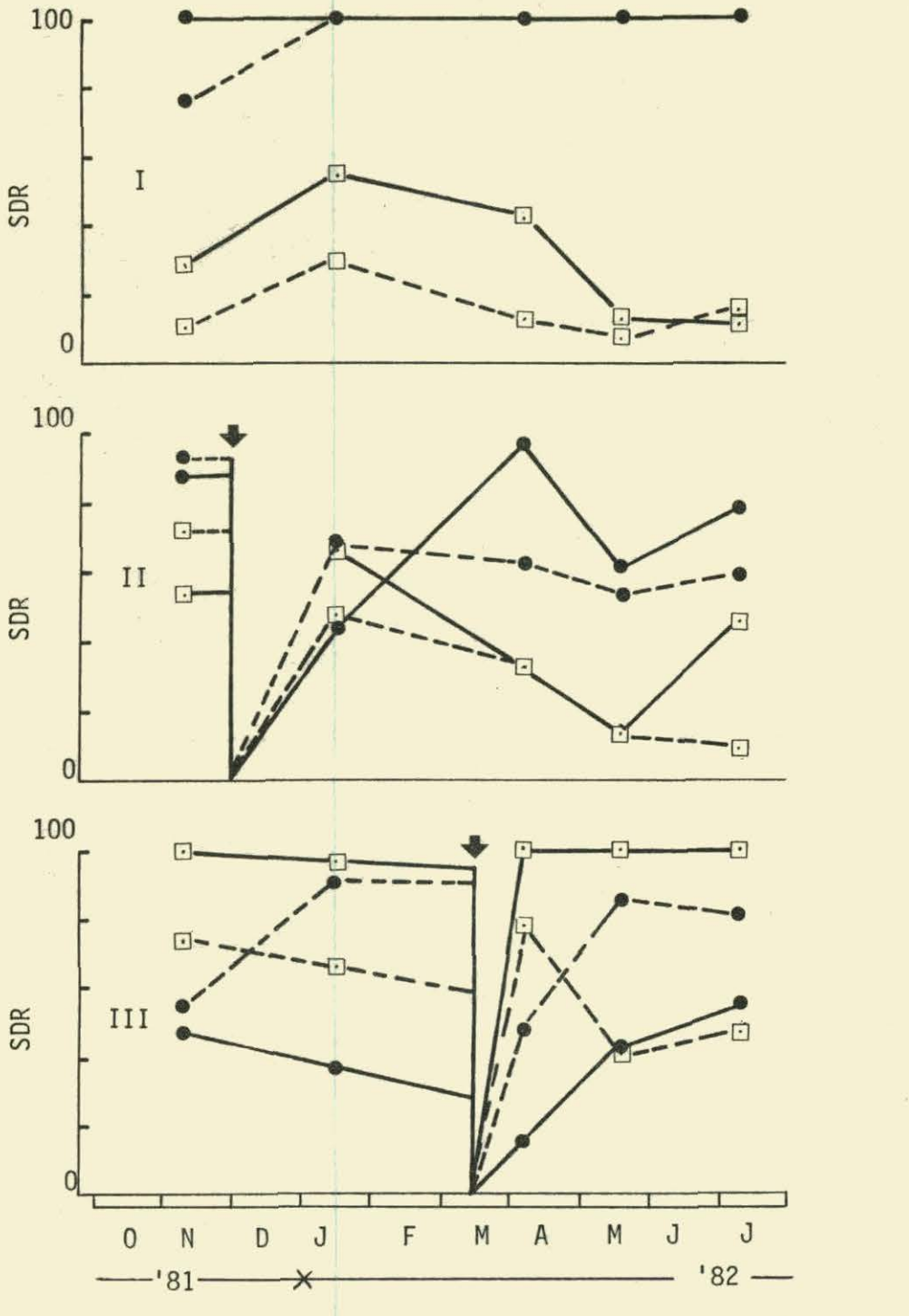

Figure 8. Seasonal changes of the SDR of *Paspalum pectinatum* and *Trachypogon vestitus* on the different burning-time savannas under grazing condition.

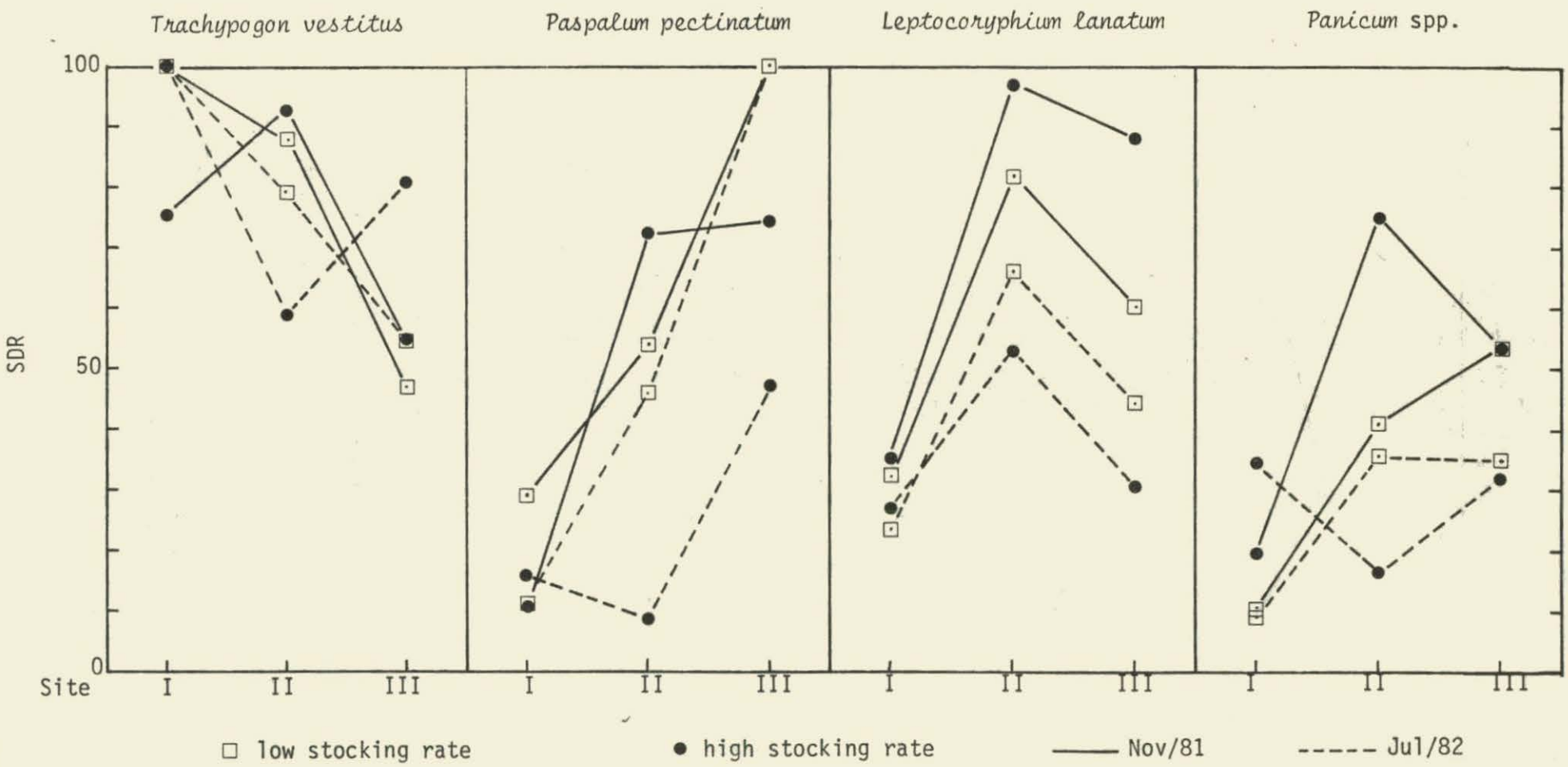

Figure 12. The SDR tendencies of *T.vestitus*, *P.pectinatum*, *L. lanatum* and *Panicum* spp. before and after burning