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EFFECT OF MULCHING ON PLANT GROWTH PERFORMANCE IN YOUNG PLANTATION PLOTS ON COAL MINE SPOIL

A. K. JHA, ARVIND SINGH, A. N. SINGH AND J. S. SINGH

Department of Botany,
Banaras Hindu University, Varanasi (U.P.)

Abstract

The recovery of mine spoils is a difficult task and mine spoils are generally infertile, particularly N and P deficient. Singh, 1991, 1992; Srivastava, et al., 1991, 1992; Srivastava, et al., 1993; therefore application of fertilizer improves the growth performance of plants raised on mine spoil. The main objective of the present study is to restore the growth performance of plants raised on mine spoils is to improve quickly to control soil characteristics (Singh, 1995).

The objective of the present study is to evaluate the effect of NPK on growth performance of *Dalmanella strictus*. *D. strictus* is a species for checking soil erosion and vegetation of coal mine spoil (Singh, 1995).

Materials and Methods

The study site is located at Jayant in Northern Coal Fields Ltd., (lat. 23°47'-24°12'N, long. 81°48'-82°00'E) and elevation 280-519 m above sea level, Pradesh, India. The climate is monsoonal and the year is

divisible into a mild winter (November-February), a hot summer (April-June), and a warm rainy season (July-September). Mean monthly minimum temperatures within the annual cycle range from 6.4-28°C and mean monthly maximum from 20-42°C. The annual rainfall averages 1069 mm, of which about 90% occurs during the period late June to September.

In July 1993 three random plots of 20 m x 20 m size were planted with *D. strictus* seedlings raised in nursery. In July 1994 each plot was divided into four sub-plots of 10 m x 10 m size. One subplot was treated with full dose of NPK, another subplot with half dose of NPK and two subplots were maintained as control (without fertilizer). In fertilizer treated subplots fertilizer mixture was spread in 20 cm wide and 5 cm deep furrows. Full dose of fertilizer was: N as urea (60 kg ha⁻¹), P as single superphosphate (30 kg ha⁻¹) and K as muriate of potash (40 kg ha⁻¹). Fertilizer application was done in July 1994 and July 1995.

Height and diameter growth and number of culms/clump was recorded in April 1996.

Results and Discussion

The number of culms/clump varied from 2-7 ($x = 3.73$), 3-8 ($x = 5.07$) and 3-12 ($x = 6.60$) in control, half dose and full dose NPK treated plots, respectively. The use of full dose of NPK treatment increased the mean number of culms/clump greater (177%) than that in half dose of NPK treatment (136%) compared to control condition (Table 1).

The influence of half dose of NPK treatment was greater on height growth of culms compared to full dose of NPK treatment (Table 1). The full dose of NPK treatment increased the diameter growth greater than half dose of NPK treatment.

Thus the influence of full dose treatment was greater on number of culms/clump and on diameter growth to half dose of NPK treatment.

Influence of half dose of NPK was greater on the height growth compared to full dose of NPK.

Conclusion

This study suggests that development of plant cover and for of plant biomass fertilizer the beneficial in drastically ecosystems such as coal mine spoils check the soil erosion and will soil fertility status.

Table 1

Influence of NPK fertilization on growth performance of *Dendrocalamus strictus* plantation spoils. Per cent increase after half and full dose of NPK treatment compared to control condition given in parentheses

Treatment	Number of culms/clump		Maximum height of culm (m)		Minimum height of culm (m)		Maximum diameter of culm (cm)		Mean diameter of culm (cm)
	Range	Mean	Range	Mean	Range	Mean	Range	Mean	
Control	2-7	3.73	2-5	3.01	0.40-3.09	1.46	1.91-3.82	2.52	0.47
½ dose of NPK	3-8	5.07 (135.9)	2-6.5	4.11 (136.5)	0.40-2.50	1.47 (100.8)	1.59-3.82	2.90 (115.1)	0.63
Full dose of NPK	3-12	6.60 (176.9)	2.25-5.0	3.97 (131.9)	0.25-3.00	1.45 (99.3)	2.38-4.14	3.16 (125.4)	0.54

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SUMMARY

Plantation of *Dendrocalamus strictus* was raised on coal mine spoil at Jayant project, Singrauli in June 1993. Half and full dose of NPK fertilizer was applied. Full dose of NPK was nitrogen as urea (60 kg ha⁻¹), phosphorus as single superphosphate (30 kg ha⁻¹) and potassium as muriate of potash (40 kg ha⁻¹). Half dose of NPK treatment increased the height of culms whereas full dose of NPK treatment enhanced markedly the number of culms/diameter growth of *D. strictus*.

निष्कर्षों पर समग्र कम उमर वाले रोपवन प्यारुओं का पापय वृद्धि पर छायाकरण करने का

प्रभाव

ए.के. शा. अरविंद सिंह, ए.एन. सिंह व जे.एस. सिंह

संग्राही

रिजिस्ट्रार, राष्ट्रीय समाज प्रयोगशाला, सिंगरौली में जून 1993 में कोयला खान निष्कर्षों पर डैन्डोकैलेस स्ट्रिक्टस की रोपण गथा । इसमें नाइट्रोजन - फास्फोरस - पोटेशियम उर्वरक की आधी और पूरी मात्रा दी गई । नाइट्रोजन - पोटेशियम की पूरी मात्रा यूरिया रूप में नाइट्रोजन (60 किग्रा/हेक्टे.) , एकल सुपरफास्फेट रूप में (30 किग्रा/हेक्टे.) और म्यूरिएट ऑफ पोटेशिया रूप में पोटेशियम (40 किग्रा/हेक्टे.) रखी गई । नाइट्रोजन - पोटेशियम की आधी मात्रा उपयोग से ऊंचाई बढ़ने में वृद्धि हुई जबकि नाइट्रोजन - फास्फोरस - पोटेशियम की पूरी मात्रा से सतिशस्तम्भ संख्या/बीड़ा और डै. स्ट्रिक्टस की व्यास वृद्धि में उल्लेखनीय बढ़ोतरी हुई ।

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die forest fires, seedling devel- Many species ved thick seed or escape the dispersal and fire ion of fruits or nent by scarifi- species of the eated CO₂ has leaf area and e dry tropical f the effect has o to the avail- ege seeds show eater seedling iginating from- nple *Prosopis malauensis* and n (for example stress resistance gta sissoo). The ed, long-term, f multiple cues and seedling within-species uitable prove- nd community mpulations of recruitment of of undesirable seed size, seed nites growing in asonality in rain- uring which the (r) is greater than occur over large a, India, South-