CPPU Foliar Sprays Increase the Growth of 'Red Caturra' Coffee Plants in the Nursery

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Mexican coffee nurseries are intensively renewing or establishing plantations with highly productive cultivars. Growers prefer to plant vigorous young trees in the field with the potential to grow rapidly and tolerate adverse conditions. Several treatments have been employed to increase the growth of coffee plants in nurseries. They include soil amendment with organic matter (Salazar and Mestre, 1993), soilless growth media (Argueta et al., 1996), inoculation of the soil with mycorrhizae (Vaast and Zasoski, 1992), shade (Valencia, 1973), and application of ethephon and gibberellic acid (GA_3) (Oyebade, 1975). The synthetic cytokinin CPPU [N_1 -(2-chloro-4-pyridyl)- N_3 -phenylurea] promotes growth in some plants by inducing cell division and expansion (Fellman et al., 1987; Lawes et al., 1991). The objective of the present study was to investigate the influence of CPPU on the vegetative growth of young 'Red Caturra' coffee plants.

The experiment was carried out in the coffee nursery at the Centro Regional Universitario Oriente of the Universidad Autónoma Chapingo in Huatusco, Veracruz, Mexico (19°0'9N, 96°57'W), at 1344-m elevation. Five-month-old 'Red Caturra' plants that had been grafted 55 d after germination on 'Robusta' [*Coffea canephora* (Pierre ex Froehner)] seedling rootstocks were established in 30-cm plastic pots (3.0 L) filled with clay loam soil. Pots were spaced 0.20 m

apart under shade provided by 2.5-m-high cuernavaca (*Solanum wrightii* Benth) trees. A random sample of 120 coffee plants was selected for the experiment. Half of the plants were sprayed to runoff with CPPU (Sitofex EC 1.0%; SKW, Trostberg, Germany) at 30 mg·L⁻¹ in Jan. 1995. The application was repeated 35 d later. Treated and control plants were randomly situated in the nursery the day after this application. The measured variables included stem diameter at 2.5 cm above the ground, and shoot and root length. Leaf area of the four largest leaves on each plant was determined by a nondestructive method (Rodriguez-Hernández et al., 1983), and fresh and dry mass of the roots and the aerial plant parts were obtained. Data were recorded in the nursery 3 months after the last CPPU application and analyzed using the procedure TTEST of SAS for independent samples (SAS, 1989).

Stem diameter, fresh and dry mass of both aerial portions and whole plants, and leaf area of the CPPU-treated plants were all significantly higher ($P \leq 0.05$) than those of the controls (Table 1). Fresh and dry mass of the roots, and root and stem length were not significantly affected by the CPPU treatment.

Table 1. Effect of the synthetic cytokinin CPPU [N_1 -(2-chloro-4-pyridyl)- N_3 -phenylurea] on the growth of 'Red Caturra' coffee plants in the nursery. Chemical application was repeated 35 d after beginning the experiment.

CPPU (mg·L ⁻¹)	Stem diam (mm)	Fresh mass (g)		Dry mass		Leaf area (mm ²) ^y
		Aerial portion ^z	Total	Aerial portion ^z	Total	
0	5.3 b ^x	25.9 b	33.9 b	6.1 b	7.8 b	63.5 b
30	7.2 a	36.0 a	45.4 a	8.5 a	10.5 a	99.8 a

^zIncluding leaves with petioles, lateral shoots, and stem.

^yMean value of the four largest leaves visually identified per plant.

^xMean separation within columns by *t* test at $P \leq 0.05$.

Treated plants were a darker, more intense, green, when assessed visually, than were the nontreated controls. Pigment syntheses can be influenced by CPPU (Karanov et al., 1992; Lawes et al., 1991). Whether or not the early benefits of CPPU treatment on coffee plant establishment will result in increases in yield of coffee beans remains to be determined.

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