

Experiment IV. Inoculation trial: Pot and field trials were conducted in the 1985-1987 rainy (mid-June through October) and postrainy (mid-October through January) seasons with four replications using a randomized complete block design. In the pot trials, the soil from Field 1 was used for Trials 4, 5, and 6; the soil from Field 2 for Trials 1 and 3; and the soil from Field 3 for Trial 2 (Table 2). In the field trials, the soil from Field 1 was used for Trials 1, 2, and 3; the soil from Field 2 for Trials 4 and 5; the soil from Field 3 for Trials 6 and 7; and the soil from Field 4 for Trials 8 and 9, respectively. Before sowing, all the pot trials received P fertilizer at 2 mg P kg⁻¹ soil in pots containing 6 kg soil (Trials 1 and 3) or 15 kg soil (Trials 2, 4, 5, and 6), and all the field trials at 17 kg P ha⁻¹, respectively. Fertilizer N treatments were added in four pot trials and in four field trials as shown in Table 2. In one field trial, pearl millet crop residues were incorporated in the soil at a rate of 4 t ha⁻¹.

For the pot trials, culture broth containing 10⁸ cells mL⁻¹ suspension was used as the inoculum. At 3 d after emergence (DAE) and 10 DAE, 200-mL broth of *Azospirillum*

Table 2. Total biomass production of pearl millet or sorghum inoculated with *Azospirillum lipoferum* and/or with *Azotobacter chroococcum*.

Trial	Crop ^a	Treatment	Total biomass production		SE ^b and statistical difference
			Control	Inoculated	
Pot trial			— g pot ⁻¹ —		
1	PM	Sterilized soil	13.9	16.3	+0.53**
2	PM	0 N	36.9	33.6	± 1.19 ^{ns}
		4 mg N kg ⁻¹ soil	47.6	44.9	
		8 mg N kg ⁻¹ soil	55.3	54.9	
3	PM	0 N	14.6	13.2	± 0.81 ^{ns}
		4 mg N kg ⁻¹ soil	21.3	22.4	
		8 mg N kg ⁻¹ soil	27.4	27.3	
4	PM	0 N	77.6	85.8	+2.85 ^{ns}
		4 mg N kg ⁻¹ soil	165.3	165.3	
		8 mg N kg ⁻¹ soil	169.9	164.5	
5	PM	0 N	73.5	74.5	± 1.55 ^{ns}
		4 mg N kg ⁻¹ soil	89.7	93.5	
		8 mg N kg ⁻¹ soil	109.5	104.2	
6	PM		84.7	89.9	± 5.79 ^{ns}
7	S		89.0	77.1	± 3.11 ^{ns}
Field trial			— kg ha ⁻¹ —		
1	PM	0 N	3,400	3,170	± 188 ^{ns}
		30 kg N ha ⁻¹	4,570	4,610	
		4 t straw ha ⁻¹	3,960	4,130	
2	PM	20 kg N ha ⁻¹	2,470	2,730	± 144 ^{ns}
3	S		4,330	4,100	± 234 ^{ns}
4	PM		1,750	1,560	± 210 ^{ns}
5	PM		1,590	1,680	± 194 ^{ns}
6	PM	0 N	2,000	1,560	± 148 ^{ns}
		20 kg N ha ⁻¹	1,850	1,740	
7	S	0 N	2,810	2,640	± 158 ^{ns}
		40 kg N ha ⁻¹	2,870	3,190	
8	S		918	980	± 36 ^{ns}
9	S		801	820	± 74 ^{ns}

^a PM, pearl millet; S, sorghum. ^b To compare control and inoculate treatment. ** Significant at the $p=0.01$ level of probability; ^{ns} Not significant at $p \geq 0.05$.

