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Supplementary table

Microorganisms for increasing sugarcane productivity: a way to complement and reduce chemical fertilization

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Supplementary Table 1. Description of sowing and harvesting dates, location (latitude and longitude), altitude, soil type and climate of the experiments carried out to evaluate the efficiency of the inoculants Azotrop, Biofree, BTP143-20 and BTP167-20 in corn crops.

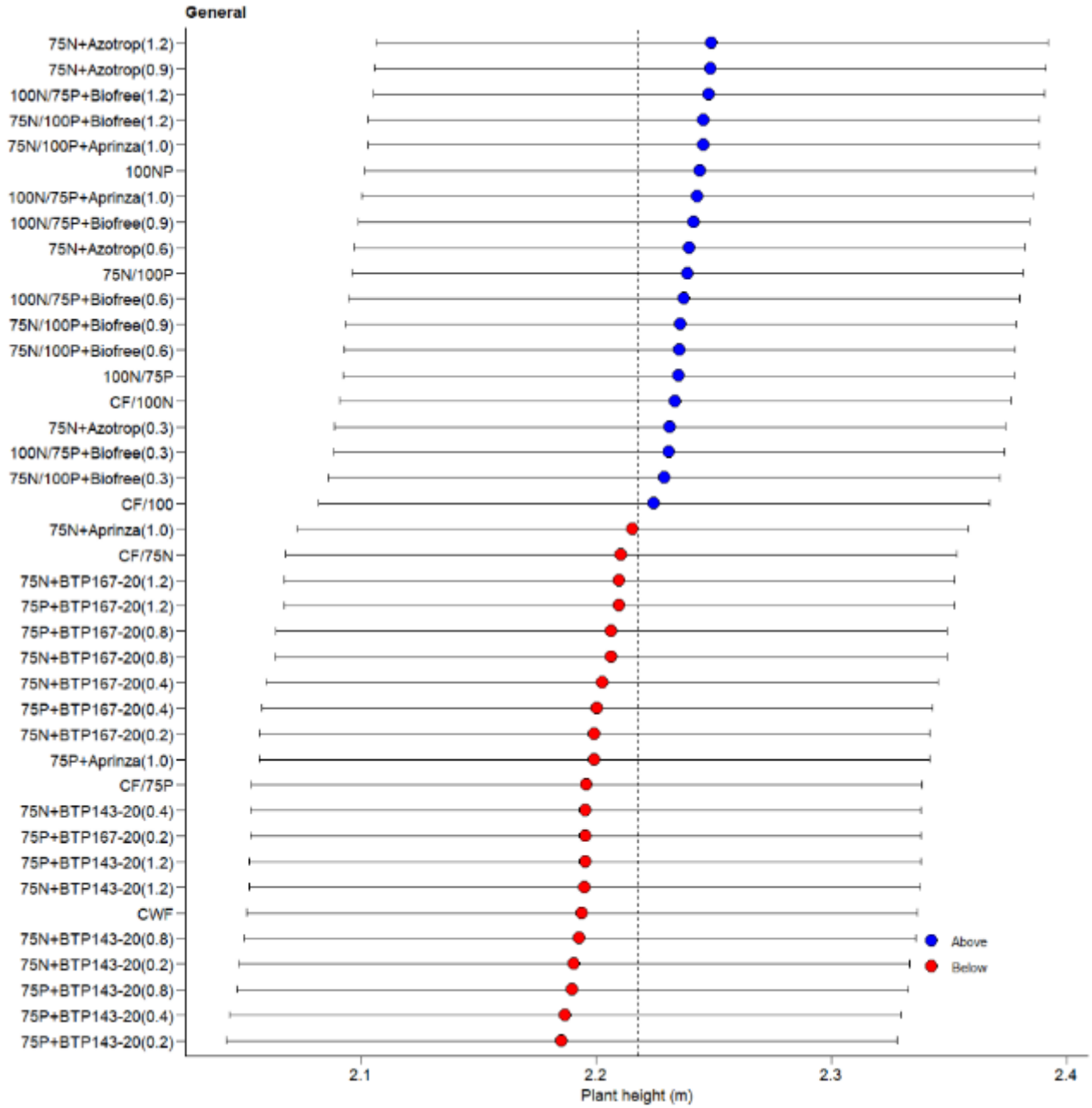
Inoculant	Local	Sowing Date	Harvest Date	Latitude	Longitude	Altitude	Soil Type	Climate
Azotrop	Chapadão do Céu-GO	2/10/2023	12/5/2023	18º35'88.1"S	52º85'39.8"W	826 m	Dystrophic Red Latosol	Am
Biofree		02/10/23	12/05/23					
BTP167-20		04/08/23	12/05/23					
BTP143-20		04/08/23	12/05/23					
Azotrop	Chapadão do Sul-MS	07/19/2022	06/22/2023	18º47'05.6" S	52º52'53.5" W	840 m	Dystrophic Red Latosol	Am
Biofree		07/19/2022	06/22/2023					
BTP167-20		07/19/2022	06/21/2023					
BTP143-20		07/19/2022	06/23/2023					
Azotrop	Piracicaba-SP	10/22/2022	08/22/2023	22º40'16.03" S	47º39'0.27" W	553 m	Dystrophic Red Yellow Latosol	Cwa
Biofree		10/24/2022	08/23/2023					
BTP167-20		10/24/2022	08/25/2023					
BTP143-20		10/24/2022	08/24/2023					
Azotrop	Andirá-PR	10/05/22	08/22/2023	23º00'24.0" S	50º12'54.08" W	444 m	Dystrophic Red Latosol	Cfa
Biofree		10/05/22	08/21/2023					
BTP167-20		10/05/22	08/22/2023					
BTP143-20	Lavras-MG	08/26/2022	06/23/2023	21º12'39.5" S	45º03'34.9" W	922 m	Dystrophic Red Latosol	Cwa

Am: intermediate tropical monsoon; Cfa: humid subtropical with hot summer; Cwa: dry winter subtropical climate.

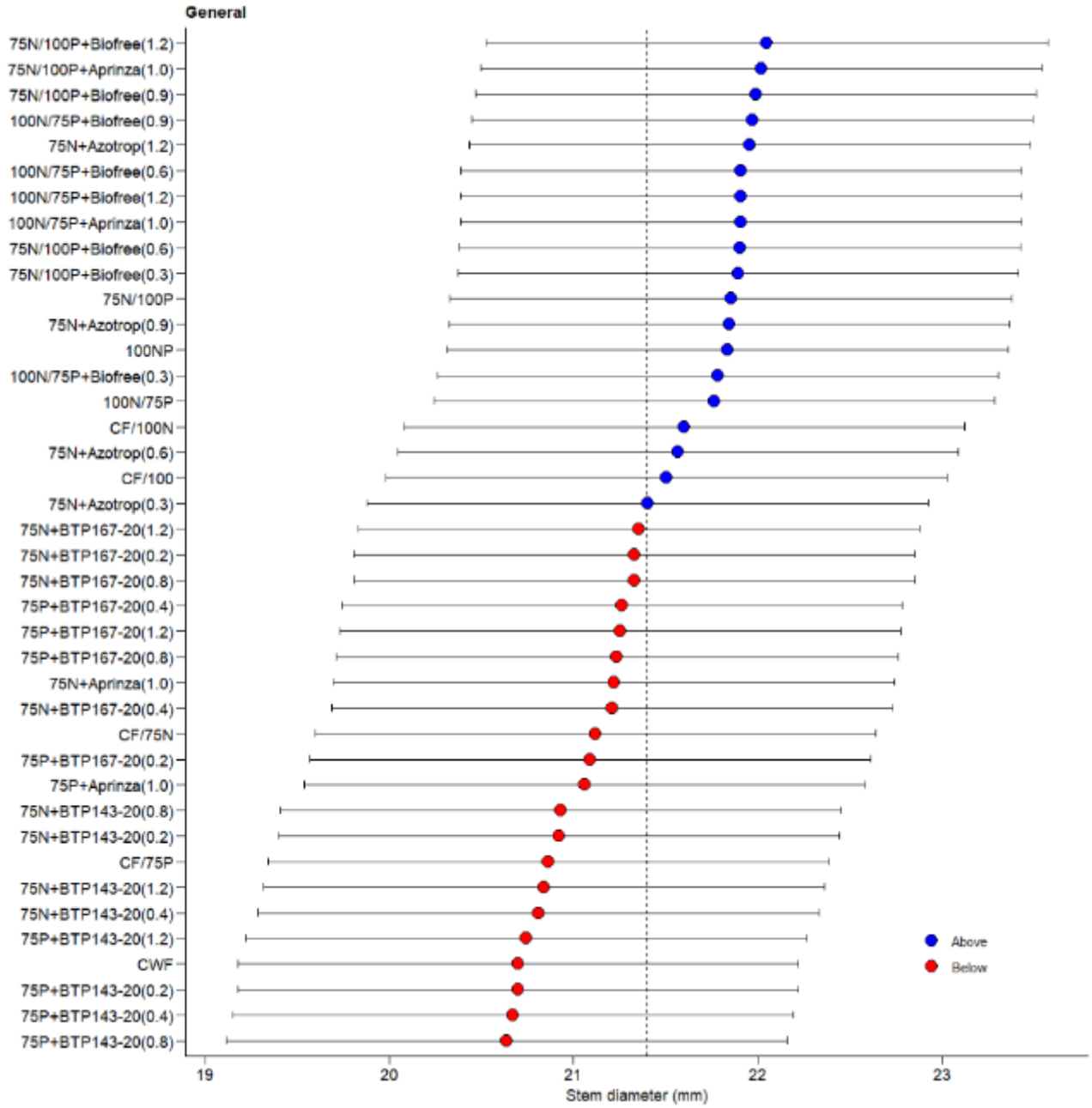
Supplementary Table 2. Description of active ingredients and treatments for each product evaluated in the experiments with sugarcane.

Product Reviewed	Treatment	Description	Active ingredient
Azotrop	CWF	Control without fertilizer	-
	CF/100N	Control with fertilizer (100% N)	-
	CF/75N	Control with fertilizer (75% N)	-
	75N+Aprinza(1.0)	75% N + 1.0 L ha^{-1} Aprinza	*Nitrospirilum amazonense* (isolated BR11145)
	75N+Azotrop(0.3)	75% N + 0.3 L ha^{-1} Azotrop	*Azospirillum brasilense* (isolated Ab-V5 e Ab-V6)
	75N+Azotrop(0.6)	75% N + 0.6 L ha^{-1} Azotrop	
	75N+Azotrop(0.9)	75% N + 0.9 L ha^{-1} Azotrop	
	75N+Azotrop(1.2)	75% N + 1.2 L ha^{-1} Azotrop	
Biofree	CWF	Control without fertilizer	-
	100NP	Control with fertilizer (100% N+P)	-
	75N/100P	Control with fertilizer (75% N)	-
	100N/75P	Control with fertilizer (75% N)	-
	100N/75P+Aprinza(1.0)	100% N + 75% P + 1.0 L ha^{-1} Aprinza	*Nitrospirilum amazonense* (isolated BR11145)
	75N/100P+Aprinza(1.0)	75% N + 100% P + 1.0 L ha^{-1} Aprinza	
	75N/100P+Biofree(0.3)	75% N + 100% P + 0.3 L ha^{-1} Biofree	*Azospirillum brasilense (isolated Ab-V6) + Pseudomonas fluorescens* (isolated CCTB04)
	75N/100P+Biofree(0.6)	75% N + 100% P + 0.6 L ha^{-1} Biofree	
	75N/100P+Biofree(0.9)	75% N + 100% P + 0.9 L ha^{-1} Biofree	
	75N/100P+Biofree(1.2)	75% N + 100% P + 1.2 L ha^{-1} Biofree	
	100N/75P+Biofree(0.3)	100% N + 75% P + 0.3 L ha^{-1} Biofree	
	100N/75P+Biofree(0.6)	100% N + 75% P + 0.6 L ha^{-1} Biofree	
	100N/75P+Biofree(0.9)	100% N + 75% P + 0.9 L ha^{-1} Biofree	
	100N/75P+Biofree(1.2)	100% N + 75% P + 1.2 L ha^{-1} Biofree	
BTP143-20	CWF	Control without fertilizer	-
	CF/100	Control with fertilizer (100% N+P)	-
	CF/75N	Control with fertilizer (75% N)	-
	CF/75P	Control with fertilizer (75% N)	-
	75P+Aprinza(1.0)	100% N + 75% P + 1.0 L ha^{-1} Aprinza	*Nitrospirilum amazonense* (isolated

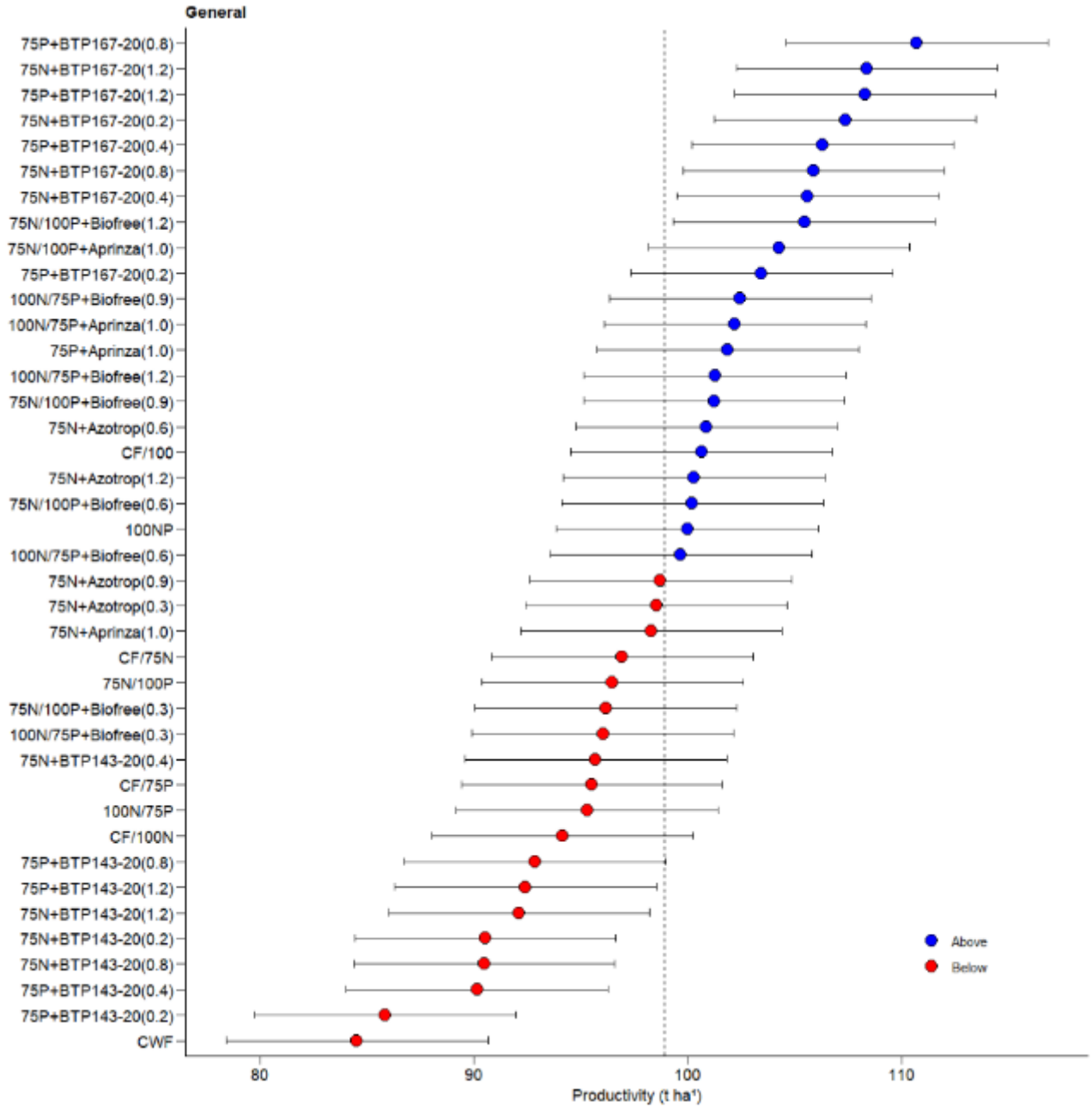
	75N+Aprinza(1.0)	75% N + 100% P + 1.0 L ha^{-1} Aprinza	BR11145)
	75N+BTP143-20(0.2)	75% N + 100% P + 0.3 L ha^{-1} BTP143-20	*Bacillus aryabhattai* (isolated CBMAI1120) + *Bacillus circulans* (isolated CCT0026) + *Bacillus haynesii* (isolated CCT7926)
	75N+BTP143-20(0.4)	75% N + 100% P + 0.6 L ha^{-1} BTP143-20	
	75N+BTP143-20(0.8)	75% N + 100% P + 0.9 L ha^{-1} BTP143-20	
	75N+BTP143-20(1.2)	75% N + 100% P + 1.2 L ha^{-1} BTP143-20	
	75P+BTP143-20(0.2)	100% N + 75% P + 0.3 L ha^{-1} BTP143-20	
	75P+BTP143-20(0.4)	100% N + 75% P + 0.6 L ha^{-1} BTP143-20	
	75P+BTP143-20(0.8)	100% N + 75% P + 0.9 L ha^{-1} BTP143-20	
	75P+BTP143-20(1.2)	100% N + 75% P + 1.2 L ha^{-1} BTP143-20	
BTP167-20	CWF	Control without fertilizer	-
	CF/100	Control with fertilizer (100% N+P)	-
	CF/75N	Control with fertilizer (75% N)	-
	CF/75P	Control with fertilizer (75% N)	-
	75P+Aprinza(1.0)	100% N + 75% P + 1.0 L ha^{-1} Aprinza	*Nitrospirilum amazonense* (isolated BR11145)
	75N+Aprinza(1.0)	75% N + 100% P + 1.0 L ha^{-1} Aprinza	
	75N+BTP167-20(0.2)	75% N + 100% P + 0.2 L ha^{-1} BTP167-20	*Paenibacillus azotofixans* (isolated CCTB10) + *Bacillus subtilis* (isolated CCTB04) + *Bacillus licheniformis* (isolated CCTB07) + *Bacillus circulans* (isolated CCTB15) *Bacillus aryabhattai* (isolated CBMAI1120) + *Bacillus circulans* (isolated CCT0026) + *Bacillus haynesii* (isolated CCT7926)
	75N+BTP167-20(0.4)	75% N + 100% P + 0.4 L ha^{-1} BTP167-20	
	75N+BTP167-20(0.8)	75% N + 100% P + 0.8 L ha^{-1} BTP167-20	
	75N+BTP167-20(1.2)	75% N + 100% P + 1.2 L ha^{-1} BTP167-20	
	75P+BTP167-20(0.2)	100% N + 75% P + 0.2 L ha^{-1} BTP167-20	
	75P+BTP167-20(0.4)	100% N + 75% P + 0.4 L ha^{-1} BTP167-20	
	75P+BTP167-20(0.8)	100% N + 75% P + 0.8 L ha^{-1} BTP167-20	
	75P+BTP167-20(1.2)	100% N + 75% P + 1.2 L ha^{-1} BTP167-20	



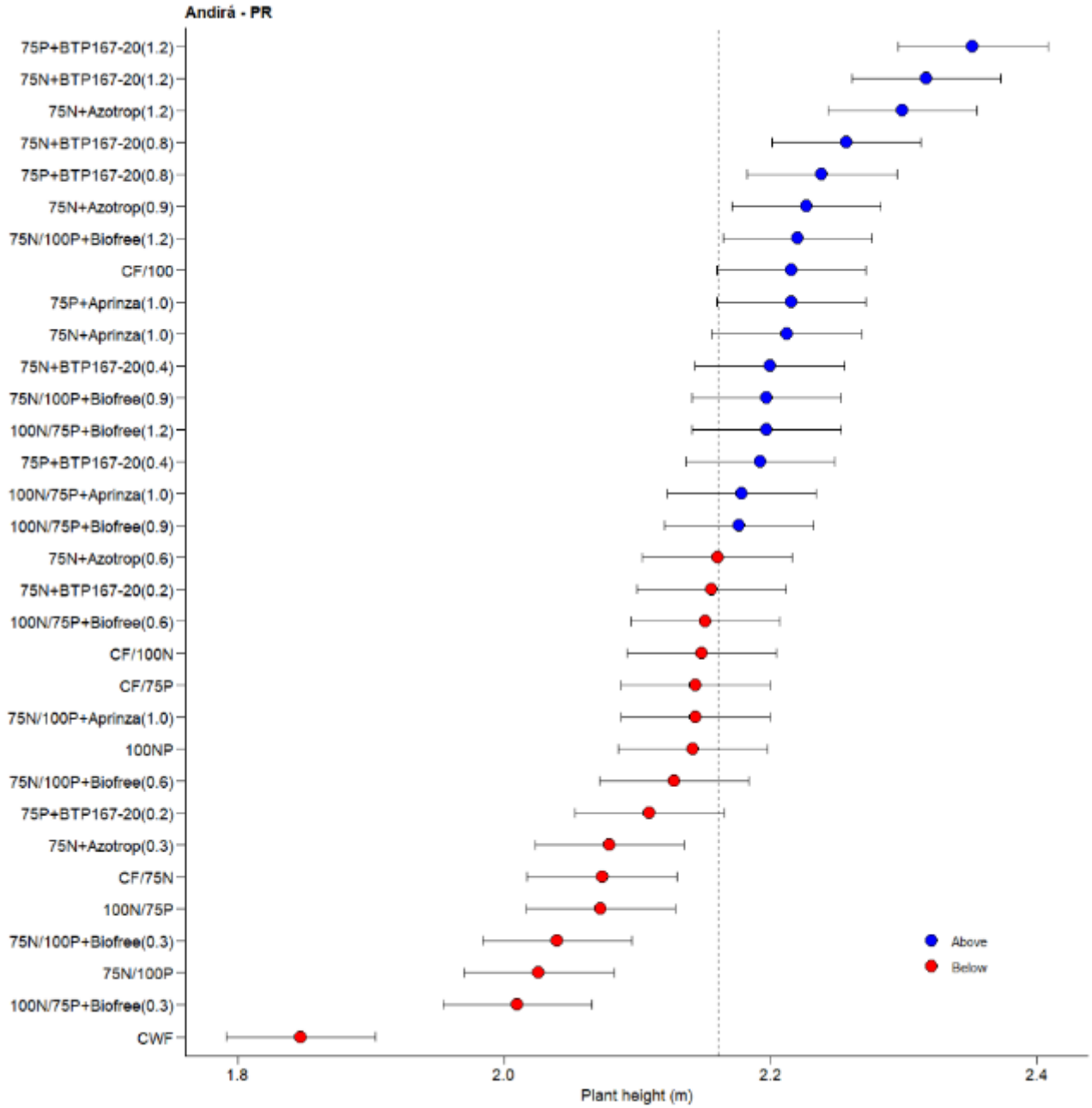
Supplementary Figure 1. General ranking of the performance of inoculants in complementing chemical fertilization for plant height (PH, m) of sugarcane.



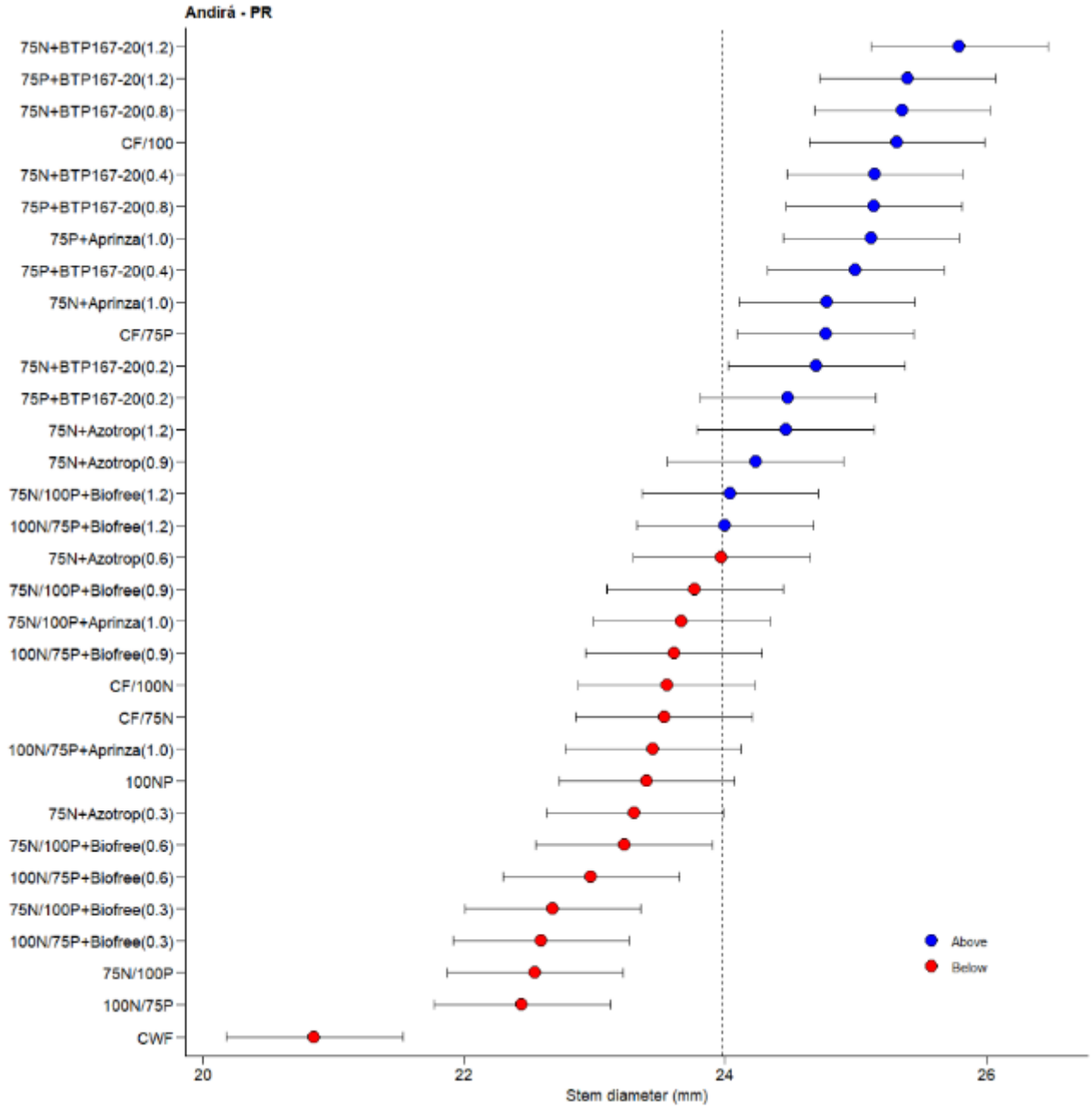
Supplementary Figure 2. General ranking of the performance of inoculants in complementing chemical fertilization for stalk diameter (SD, mm) of sugarcane.



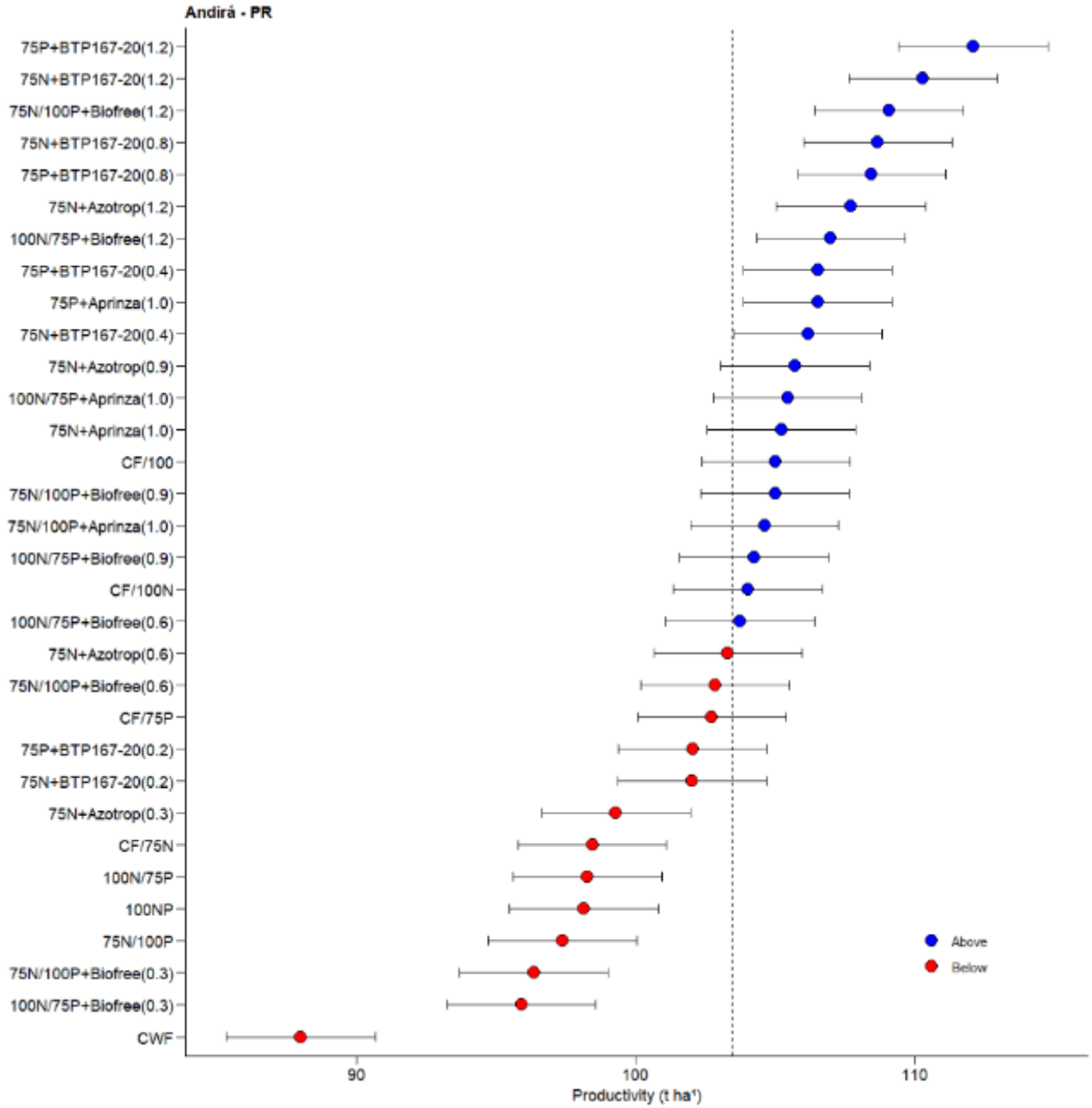
Supplementary Figure 3. General ranking of the performance of inoculants in complementing chemical fertilization for stalk productivity (PROD, t ha^{-1}) of sugarcane.



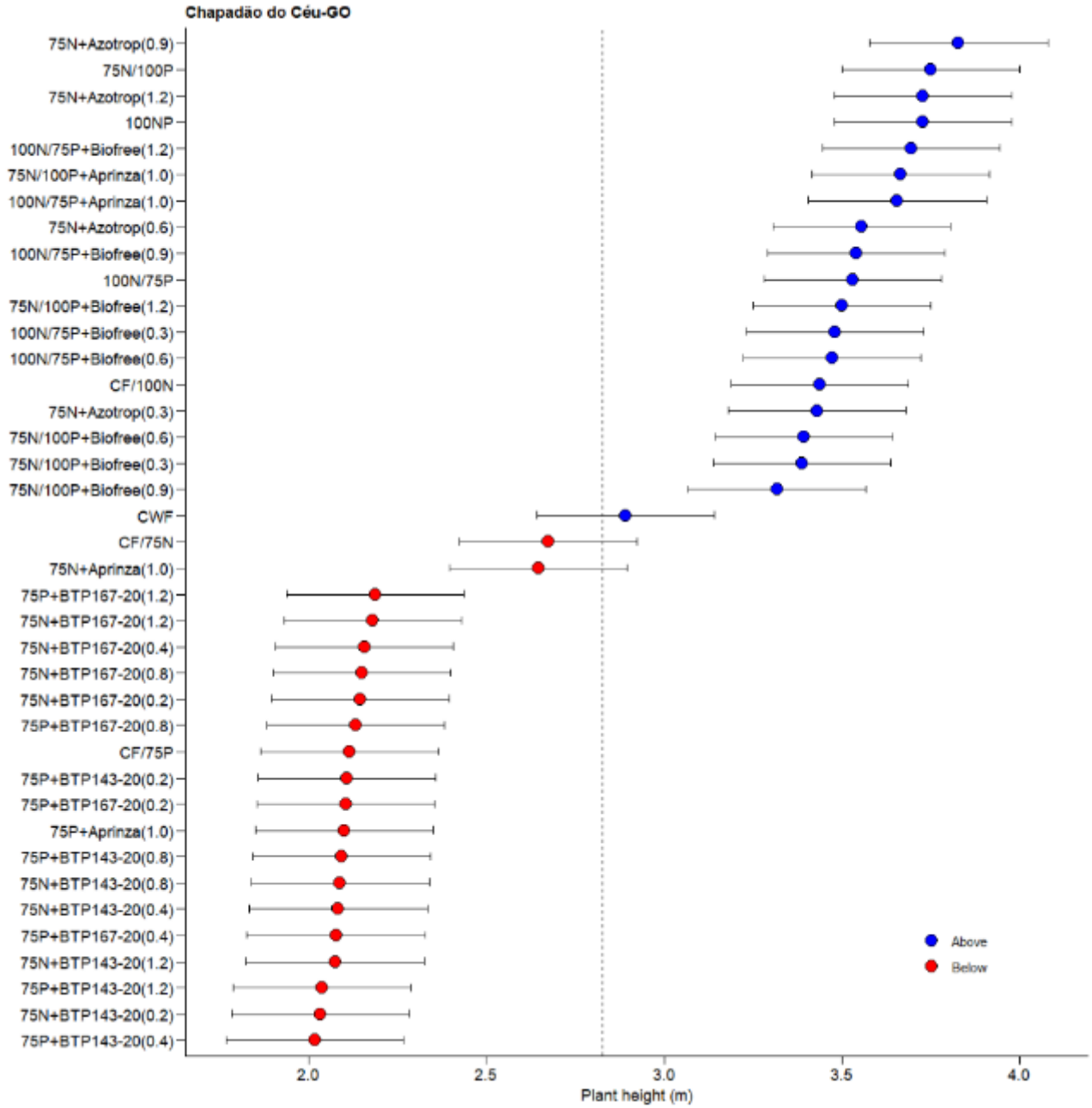
Supplementary Figure 4. Ranking of the performance of inoculants in complementing chemical fertilization for plant height (PH, m) of sugarcane in the Andirá-PR environment.



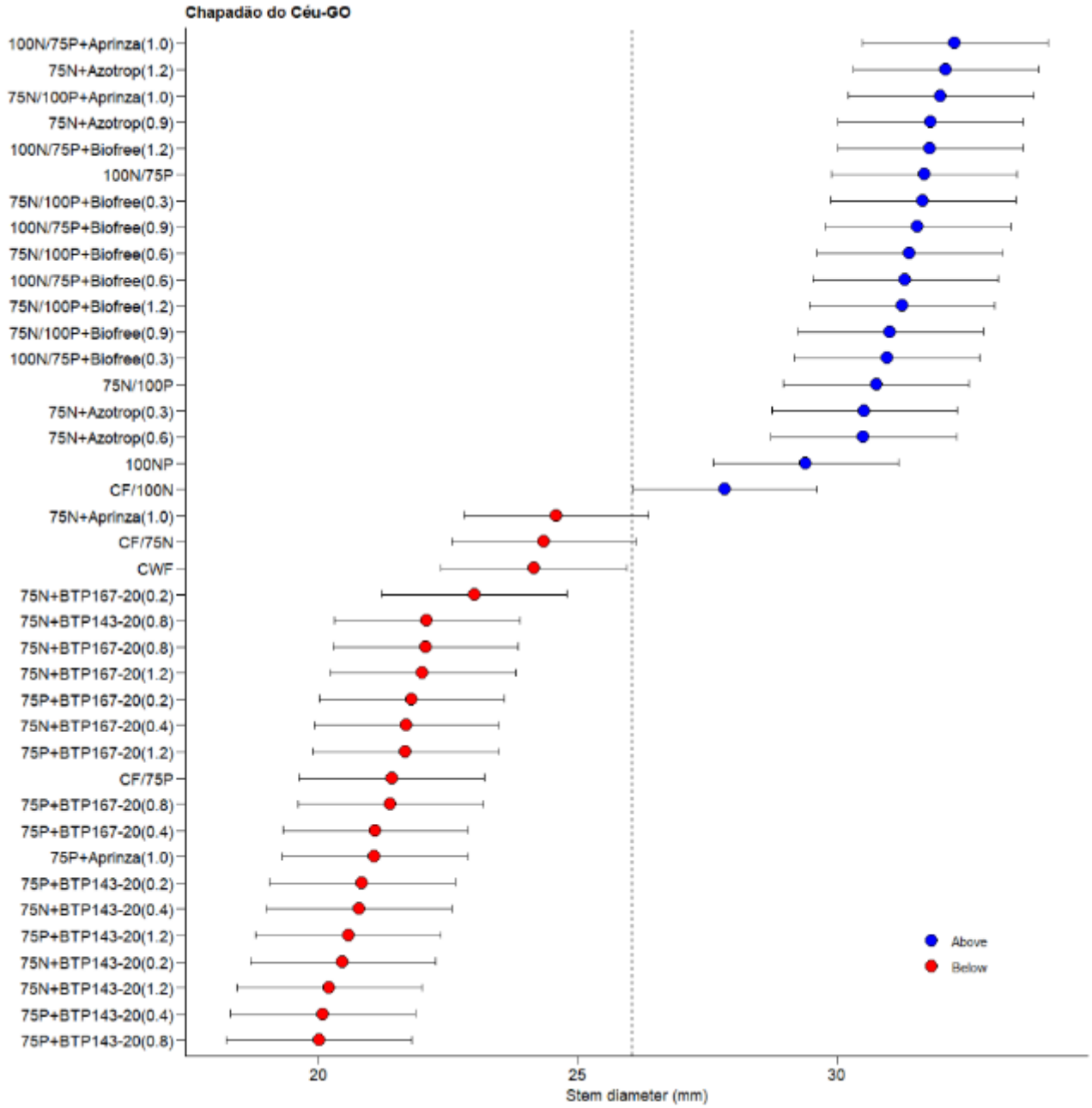
Supplementary Figure 5. Ranking of the performance of inoculants in complementing chemical fertilization for stalk diameter (SD, mm) of sugarcane in the Andirá-PR environment.



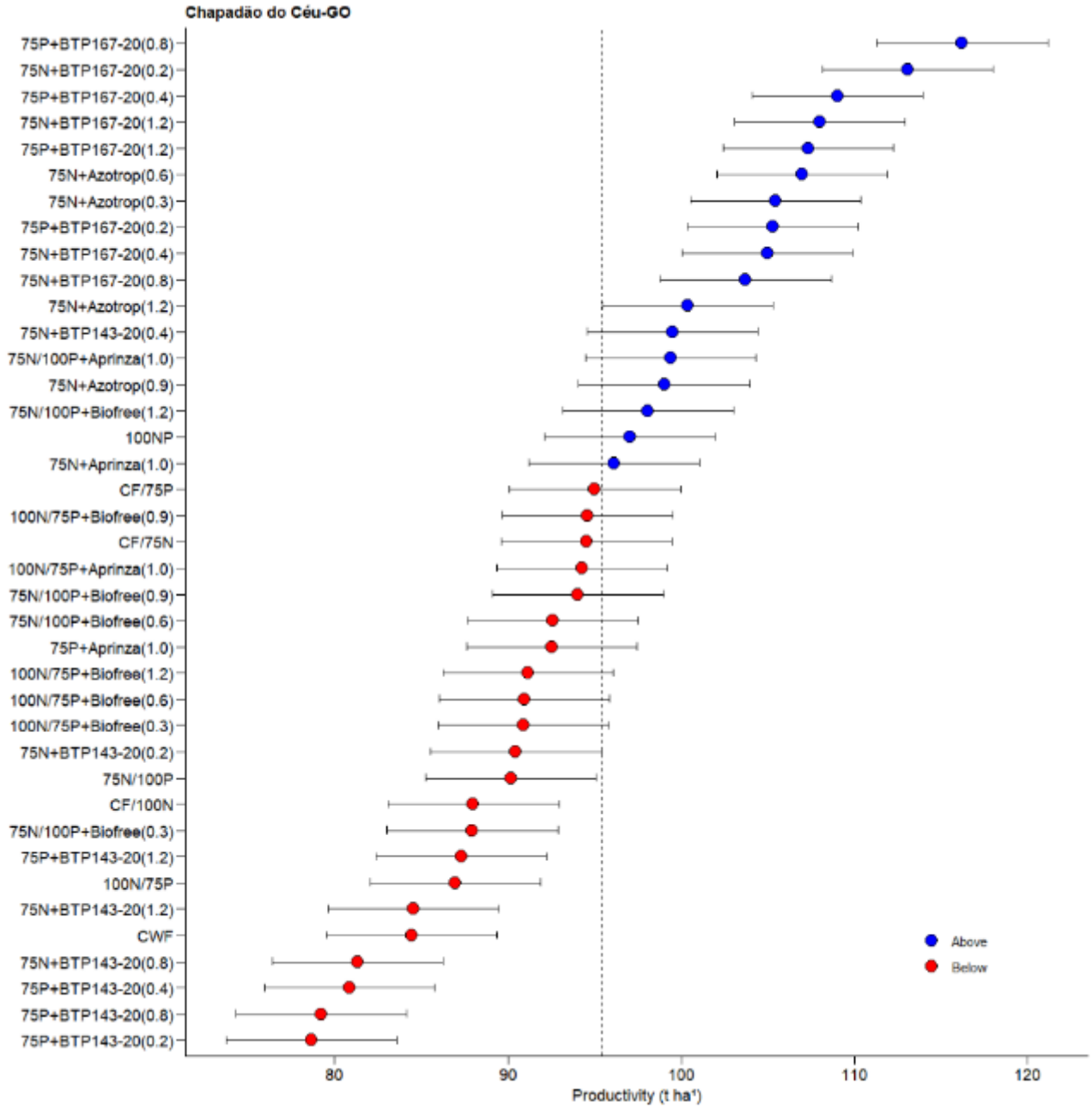
Supplementary Figure 6. Ranking of the performance of inoculants in complementing chemical fertilization for stalk productivity (PROD, t ha^{-1}) of sugarcane in the Andirá-PR environment.



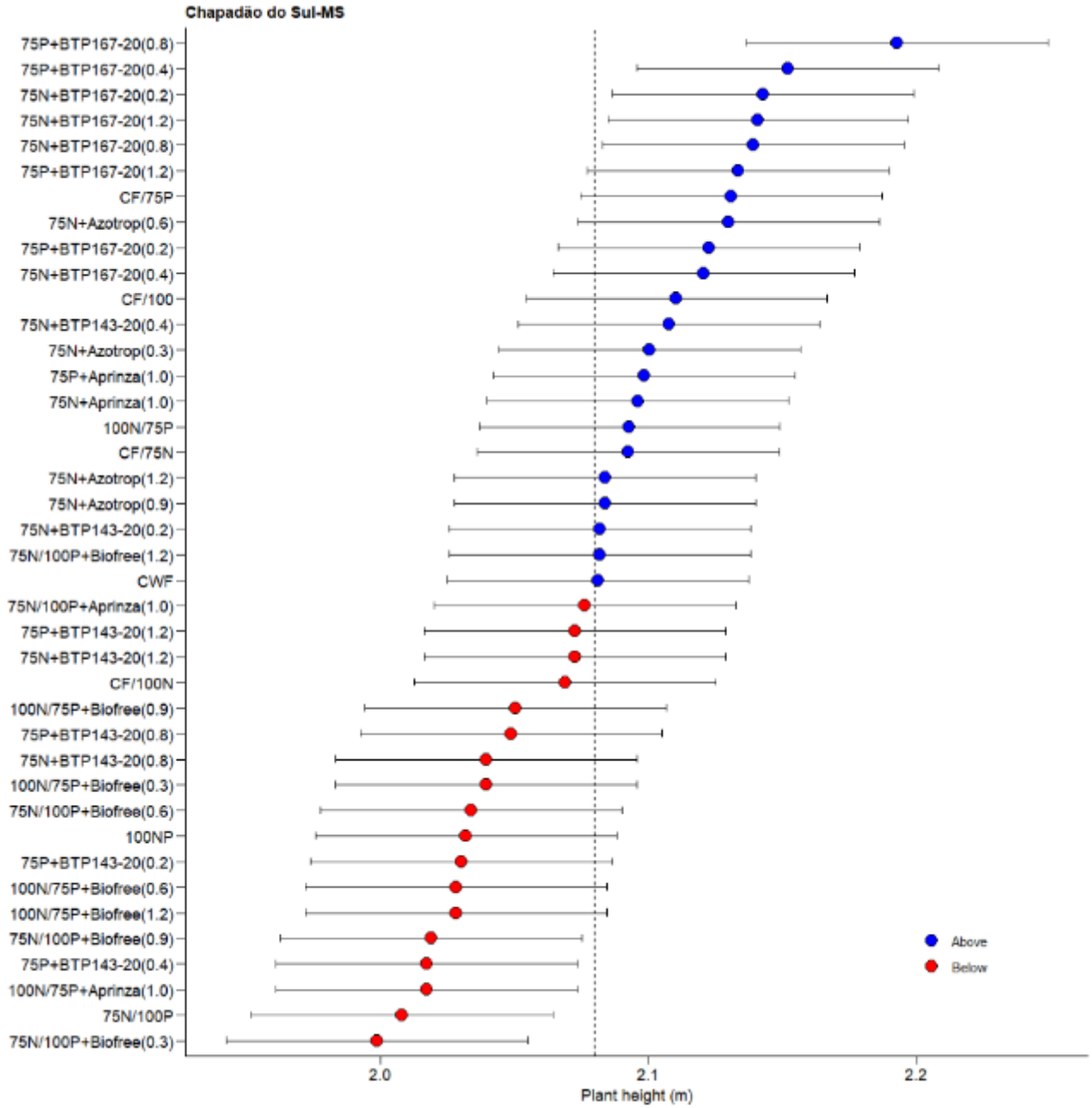
Supplementary Figure 7. Ranking of the performance of inoculants in complementing chemical fertilization for plant height (PH, m) of sugarcane in the environment of Chapadão do Céu-GO.



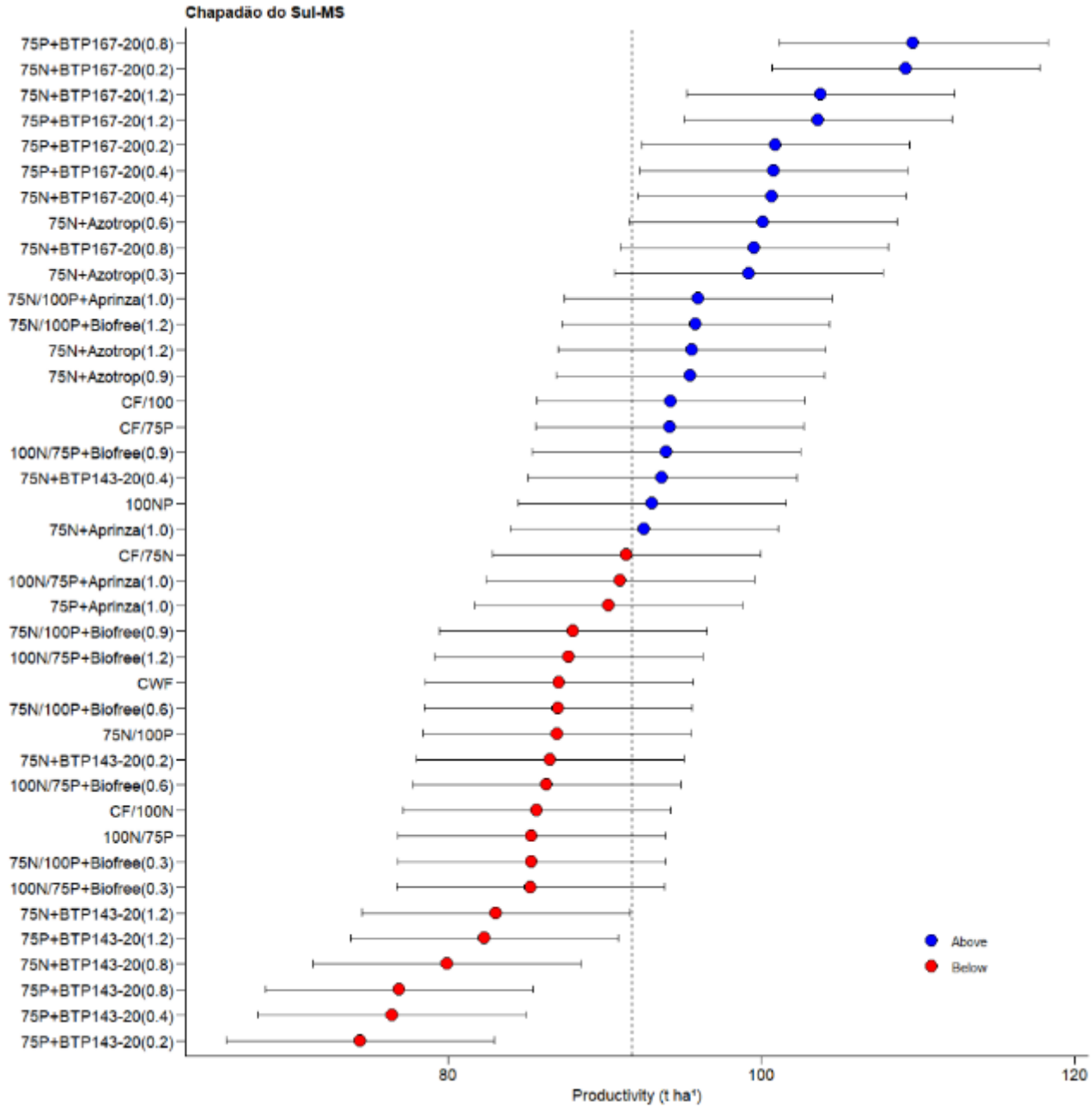
Supplementary Figure 8. Ranking of the performance of inoculants in complementing chemical fertilization for stalk diameter (SD, mm) of sugarcane in the environment of Chapadão do Céu-GO.



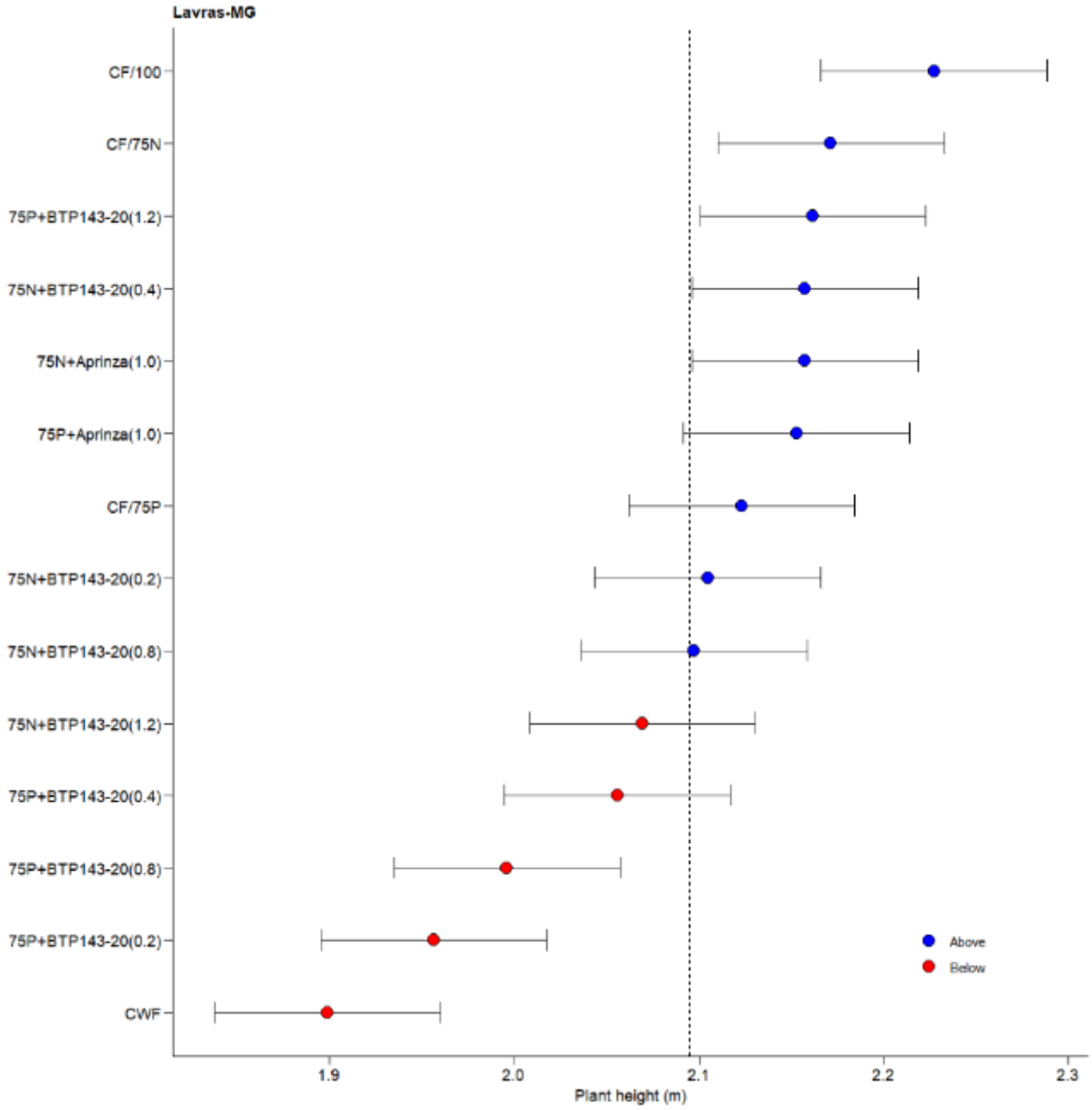
Supplementary Figure 9. Ranking of the performance of inoculants in complementing chemical fertilization for stalk productivity (PROD, t ha^{-1}) of sugarcane in the environment of Chapadão do Céu-GO.



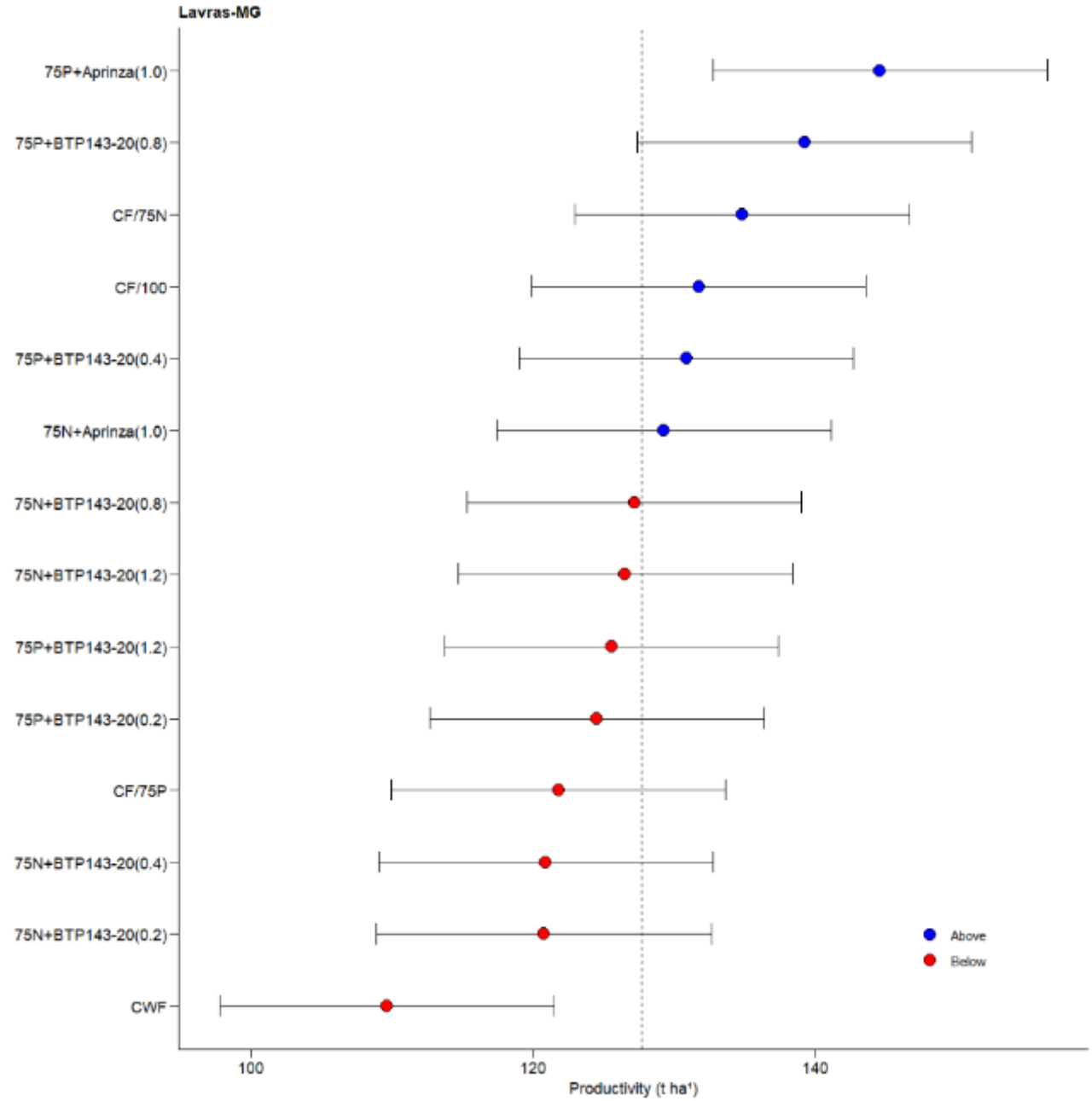
Supplementary Figure 10. Ranking of the performance of inoculants in complementing chemical fertilization for plant height (PH, m) of sugarcane in the environment of Chapadão do Sul-MS.



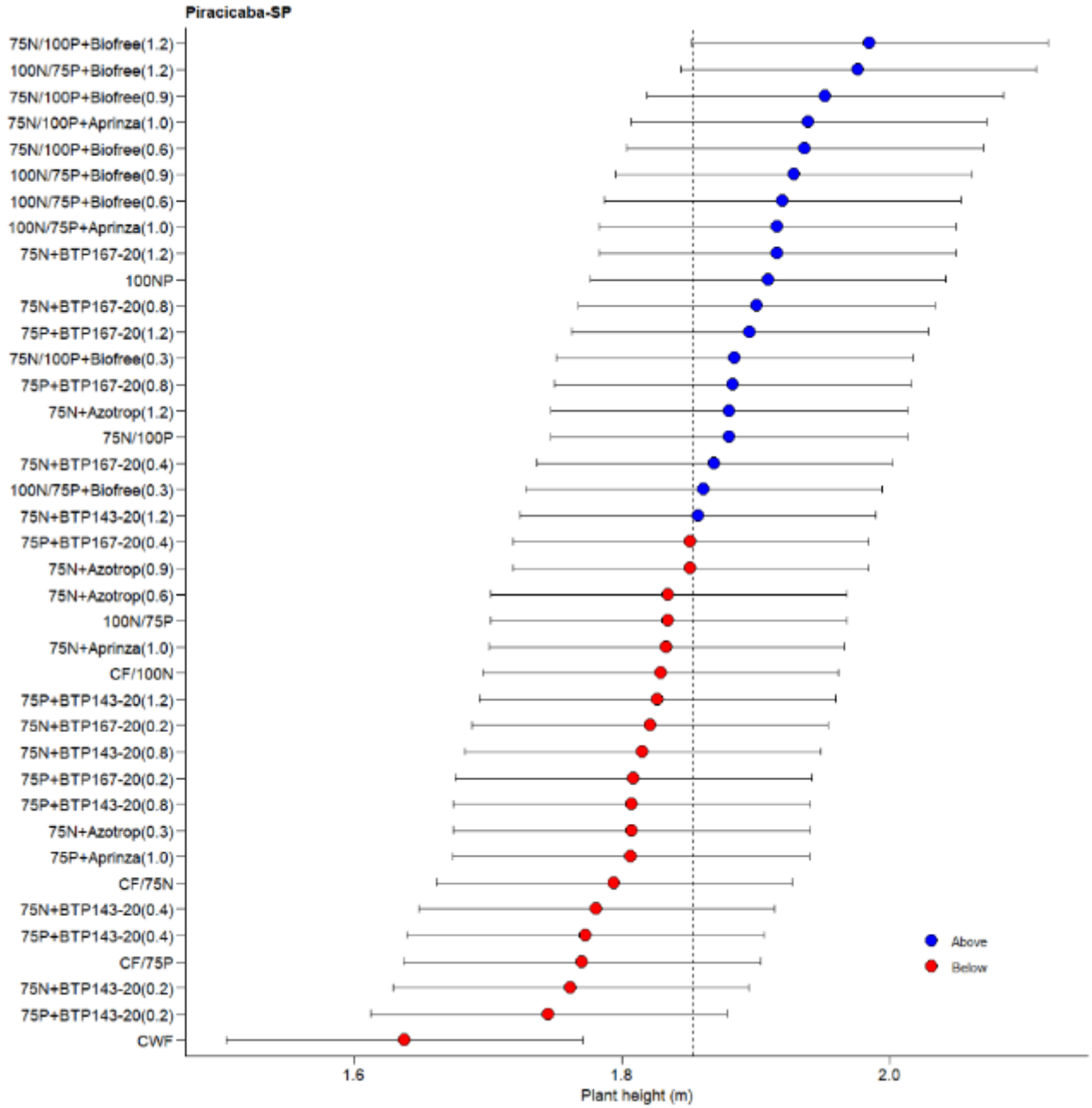
Supplementary Figure 11. Ranking of the performance of inoculants in complementing chemical fertilization for stalk productivity (PROD, t ha^{-1}) of sugarcane in the environment of Chapadão do Sul-MS.



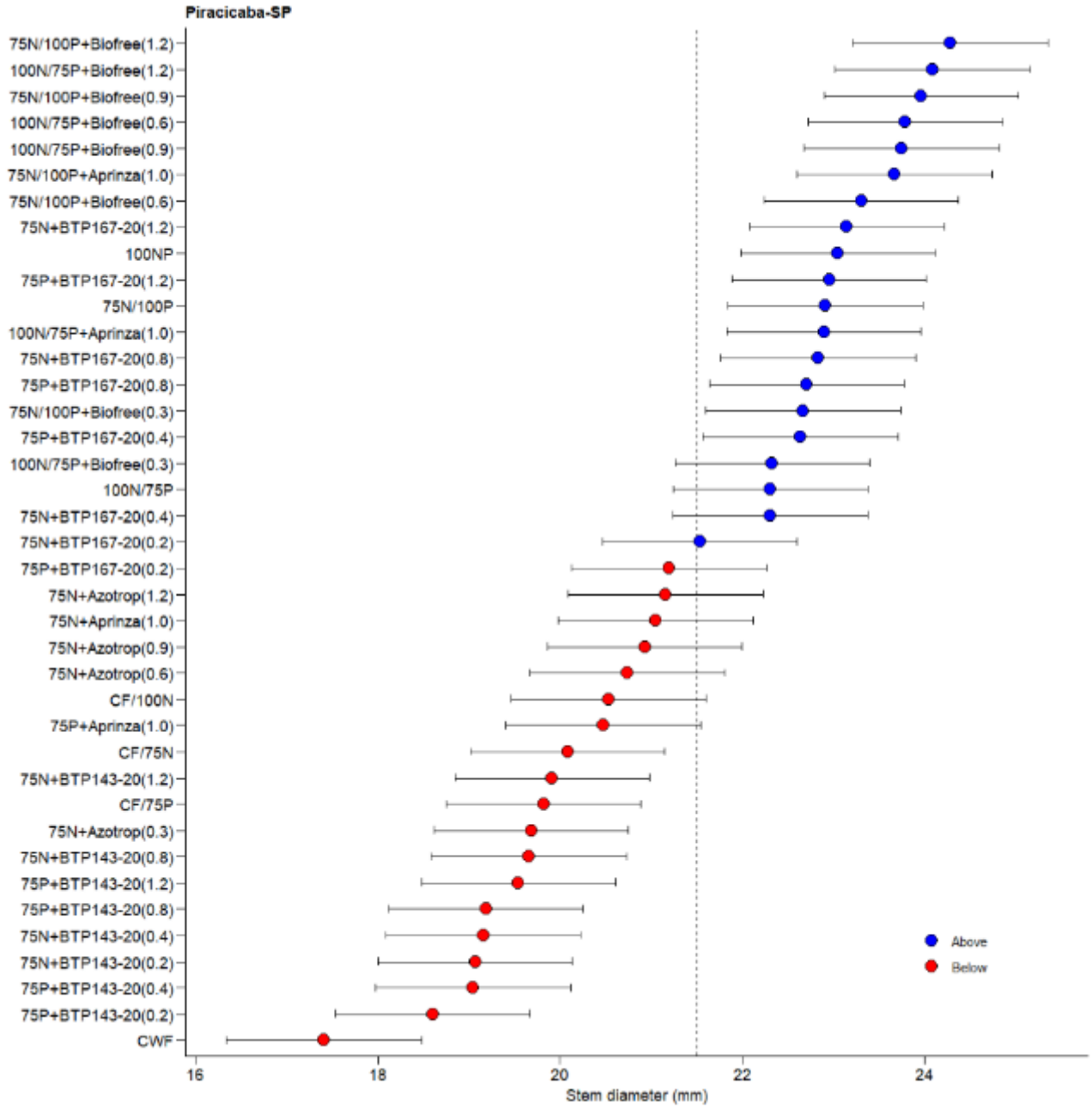
Supplementary Figure 12. Ranking of the performance of inoculants in complementing chemical fertilization for plant height (PH, m) of sugarcane in the Lavras-MG environment.



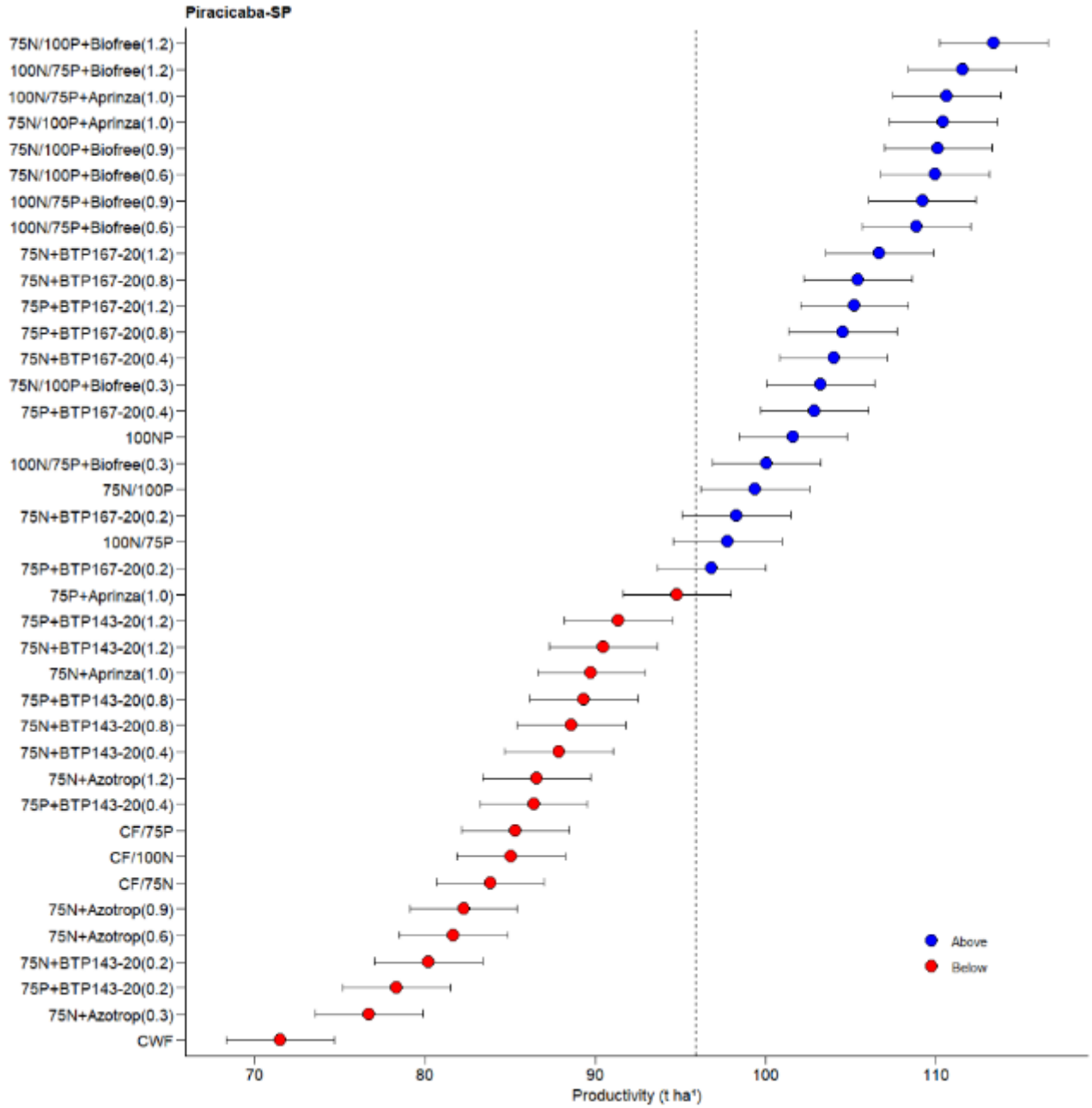
Supplementary Figure 13. Ranking of the performance of inoculants in complementing chemical fertilization for stalk productivity (PROD, t ha^{-1}) of sugarcane in the Lavras-MG environment.



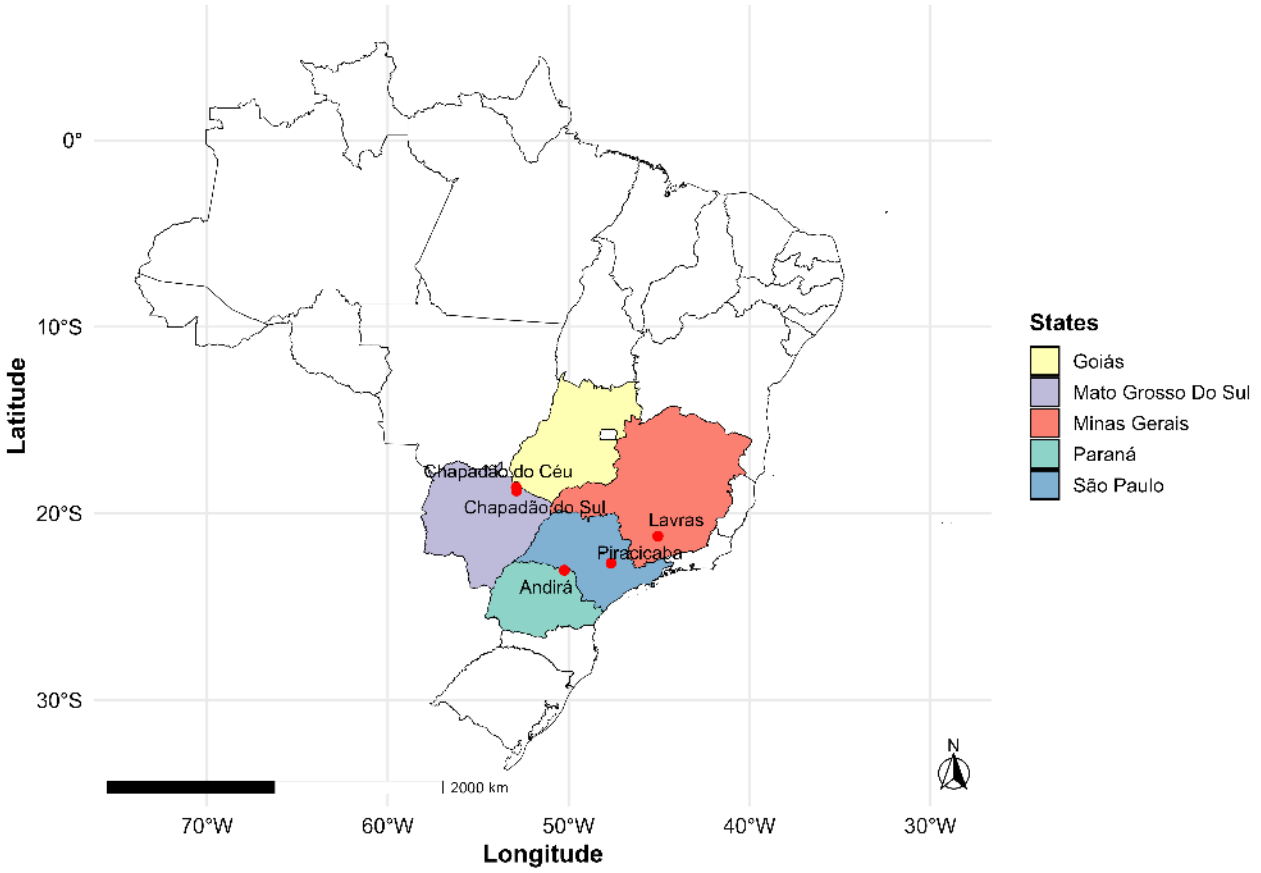
Supplementary Figure 14. Ranking of the performance of inoculants in complementing chemical fertilization for plant height (PH, m) of sugarcane in the environment of Piracicaba-SP.



Supplementary Figure 15. Ranking of the performance of inoculants in complementing chemical fertilization for stalk diameter (SD, m) of sugarcane in the environment of Piracicaba-SP.



Supplementary Figure 16. Ranking of the performance of inoculants in complementing chemical fertilization for stalk productivity (PROD, t ha^{-1}) of sugarcane in the environment of Piracicaba-SP.



Supplementary Figure 17. Geospatial location of the municipalities where the sugarcane experiments were conducted. Source: Map ploted using the 'geobr', 'sf' and 'ggspatial' package