

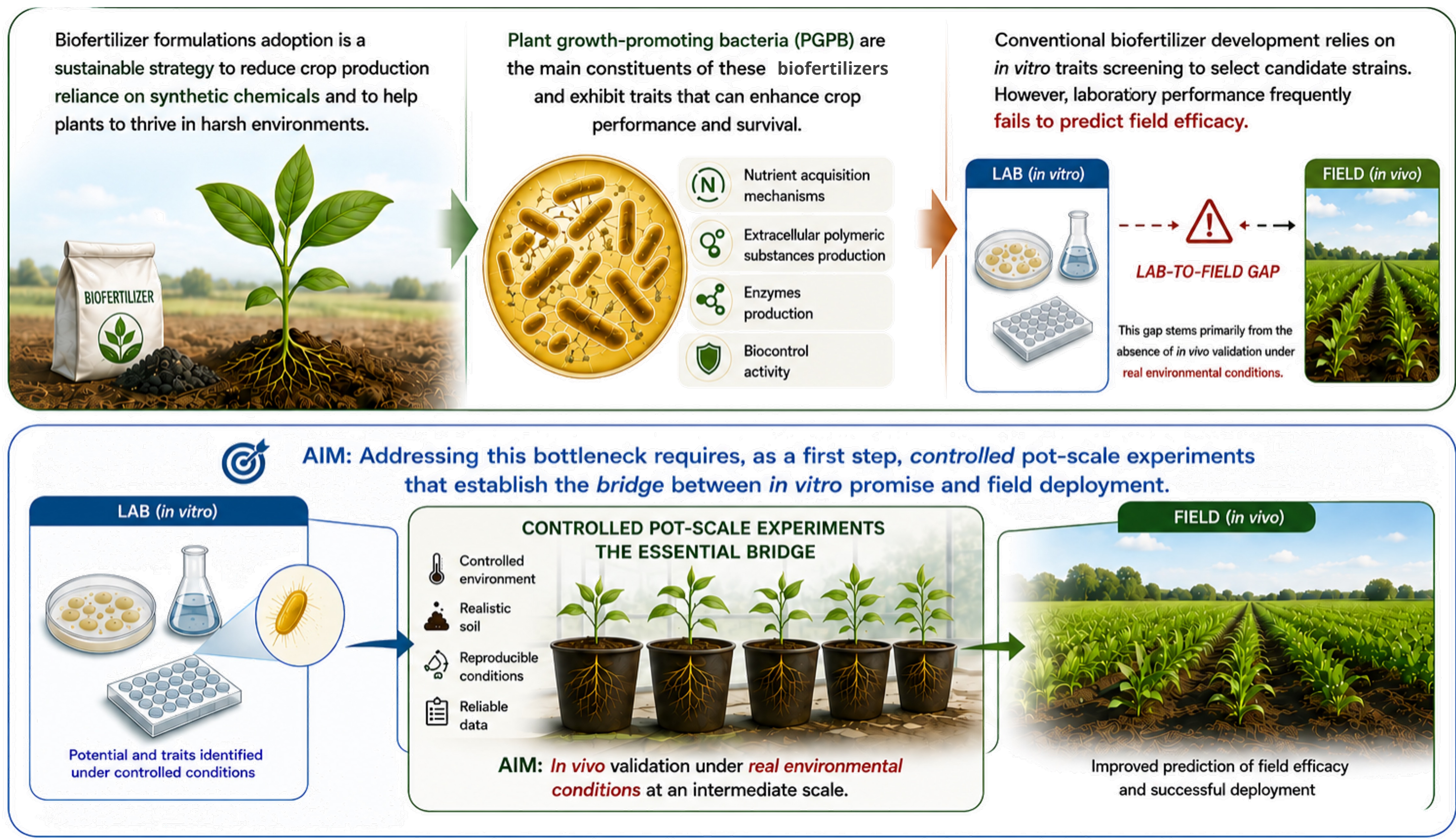
In vivo Performance of Plant Growth-Promoting Bacteria: Pot-Scale Validation for Biofertilizer Development

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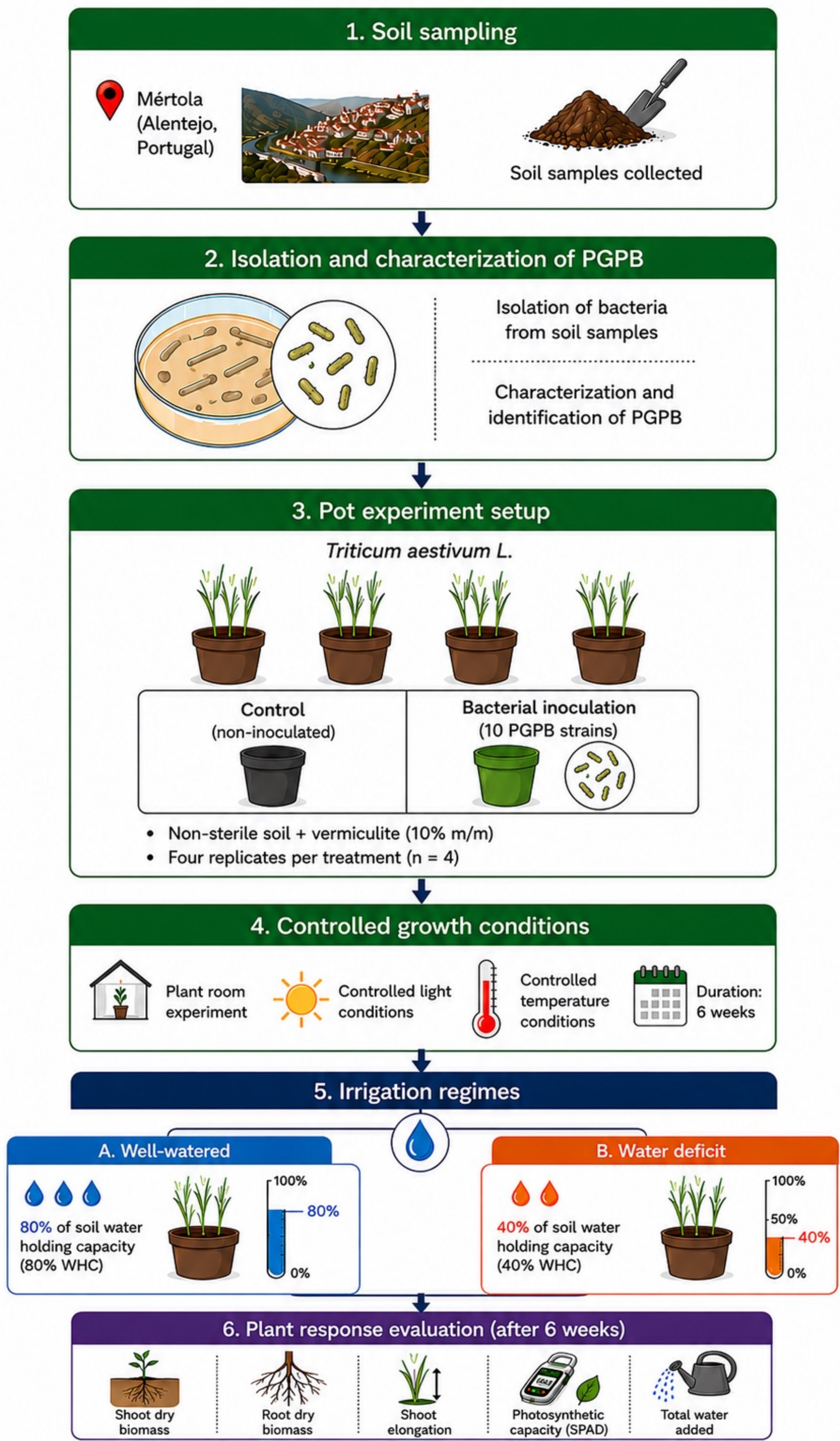
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Scope



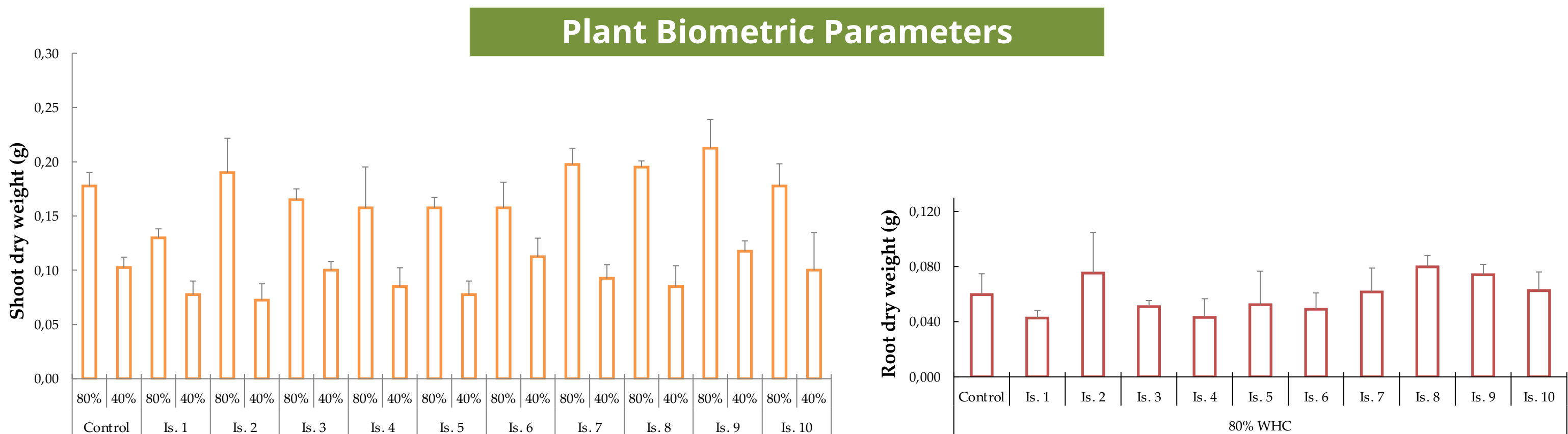
Experimental design



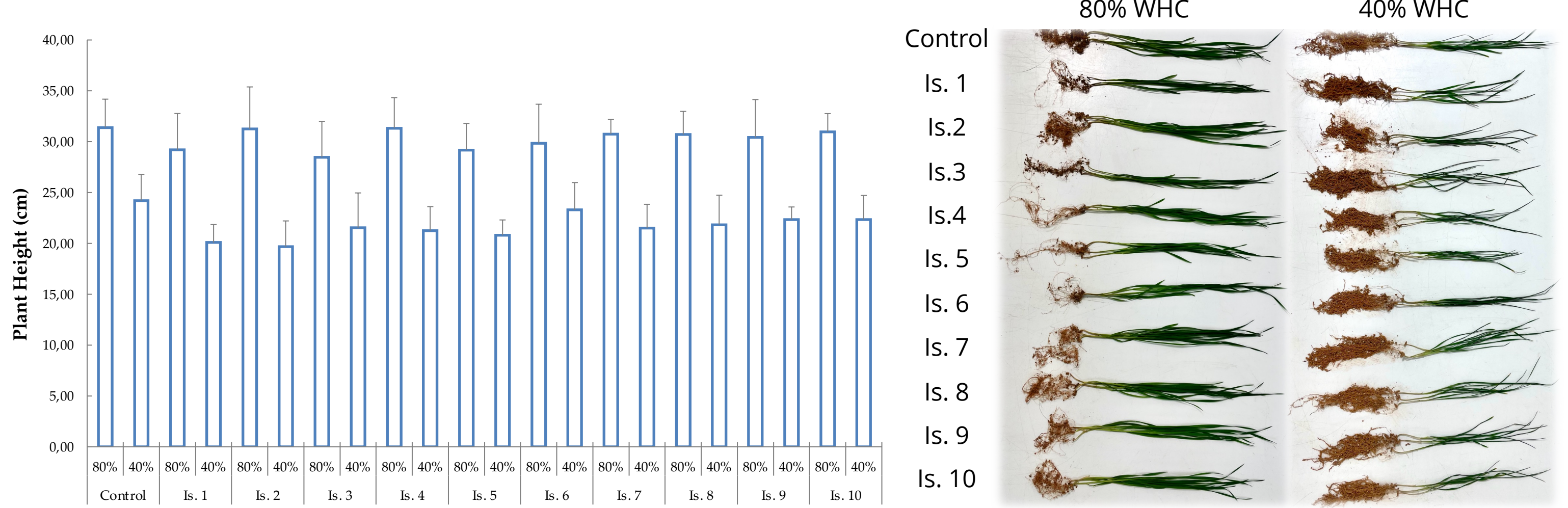
Main Results

Isolate	Closest relatives	Similarity %	P solubilization	N ₂ fixation	Extracellular enzymes production			EPS production
					Protease	Pectinase	Lipase	
Is. 1	<i>Neobacillus niacini</i>	98.09	+	+	+	+	-	-
Is. 2	<i>Bacillus mycoides</i>	98.86	-	-	+	-	+	-
Is. 3	<i>Staphylococcus pasteurii</i>	99.52	-	-	-	-	+	+
Is. 4	<i>Pseudomonas</i> sp.	99.61	+	-	+	-	+	-
Is. 5	<i>Pseudomonas</i> sp.	99.66	+	-	+	-	+	-
Is. 6	<i>Pseudomonas</i> sp.	100.00	+	-	-	-	+	-
Is. 7	<i>Chryseobacterium indoltheticum</i>	100.00	-	+	+	-	+	+
Is. 8	<i>Paenibacillus amylolyticus</i>	98.91	+	-	+	+	+	+
Is. 9	N.I.		-	-	-	-	-	-
Is. 10	<i>Kocuria</i> sp.	99.16	+	+	+	-	+	+

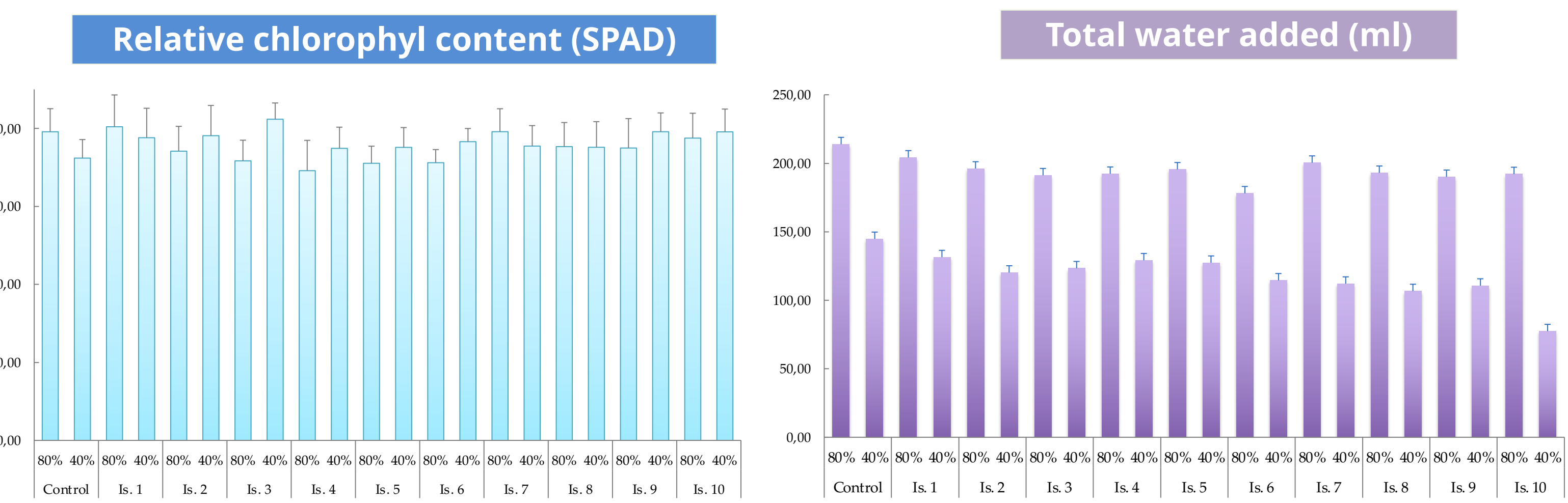
* N.I.: not identified



- ✓ An apparent **increase in the shoot dry biomass** is observed with the inoculation of **Is. 9**, in the **80% WHC** test condition.
- ✓ ***Neobacillus niacini*** also appears to have **reduced the shoot and root dry weight of plants in the 80% WHC** test condition.



- ✓ **Plant height** values appeared to be **consistent across the different treatments, under the well-watered (80% WHC) test condition**.
- ✓ Under the **water deficit (40% WHC) condition**, plants inoculated with ***Neobacillus niacini* and *Bacillus mycoides*** showed a **slight reduction in plant height and in shoot dry biomass**.



- ✓ **SPAD values** of plants inoculated with ***P. amylolyticus* (Is. 8) and *Kocuria* sp. (Is.10)** showed **no differences between the well-watered and water deficit conditions**.
- ✓ ***P. amylolyticus* (Is.8) and *Kocuria* sp. (Is.10)** appear to have **slightly reduced the need for irrigation, even under a water deficit condition**.
- ✓ ***Pseudomonas* sp. (Is. 6)** stood out for **requiring less water** under well-irrigated condition.



The results suggest that **validation of the different strains on plant performance is an essential step in defining microbial consortia**, as bacteria with the same positive traits resulted in different parameters outcomes.



- ✓ Soil aggregates stability, soil basal respiration, soil and shoot total N.
- ✓ New pot experiment to validate the performance of twenty more isolates.

Acknowledgements

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