

## Development of Drought Resilient Root-stock Grafting and Cell to Cell communications

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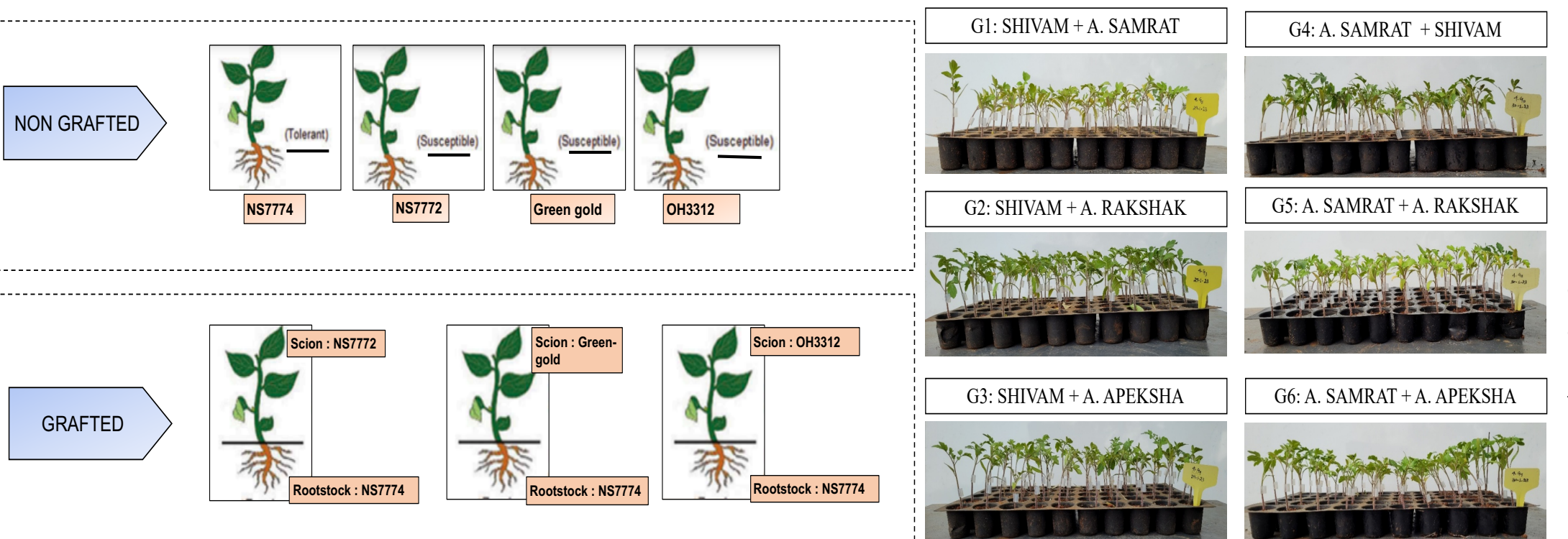
### INTRODUCTION & AIM

- Indian agriculture is a critical sector contributing approximately 17-18% of the GDP and supporting nearly 50% of the workforce.
- India's population is projected to reach 1.7 billion by 2050, requiring a significant increase in food production. **(Increased Demand for Food)**
- Overuse of water resources for irrigation is leading to acute water shortages. **(Water Scarcity)**
- Erratic weather patterns, rising temperatures, and reduced rainfall affect crop yields. **(Climate Change)**
- A majority of Indian farmers operate on small and fragmented plots, limiting economies of scale **(Fragmented Landholdings)**

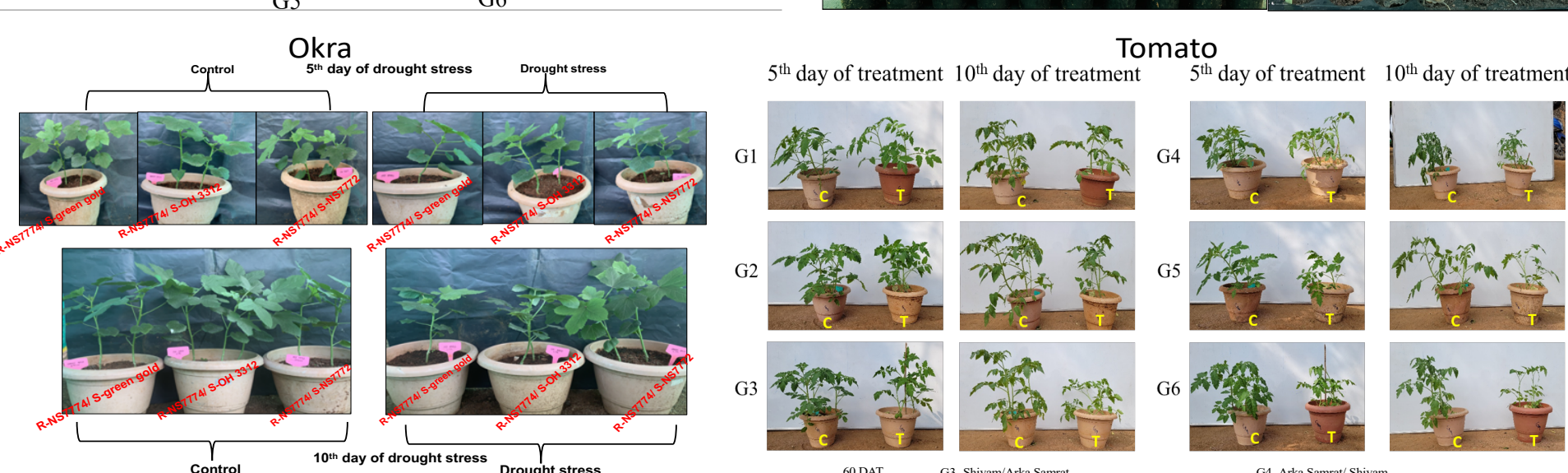
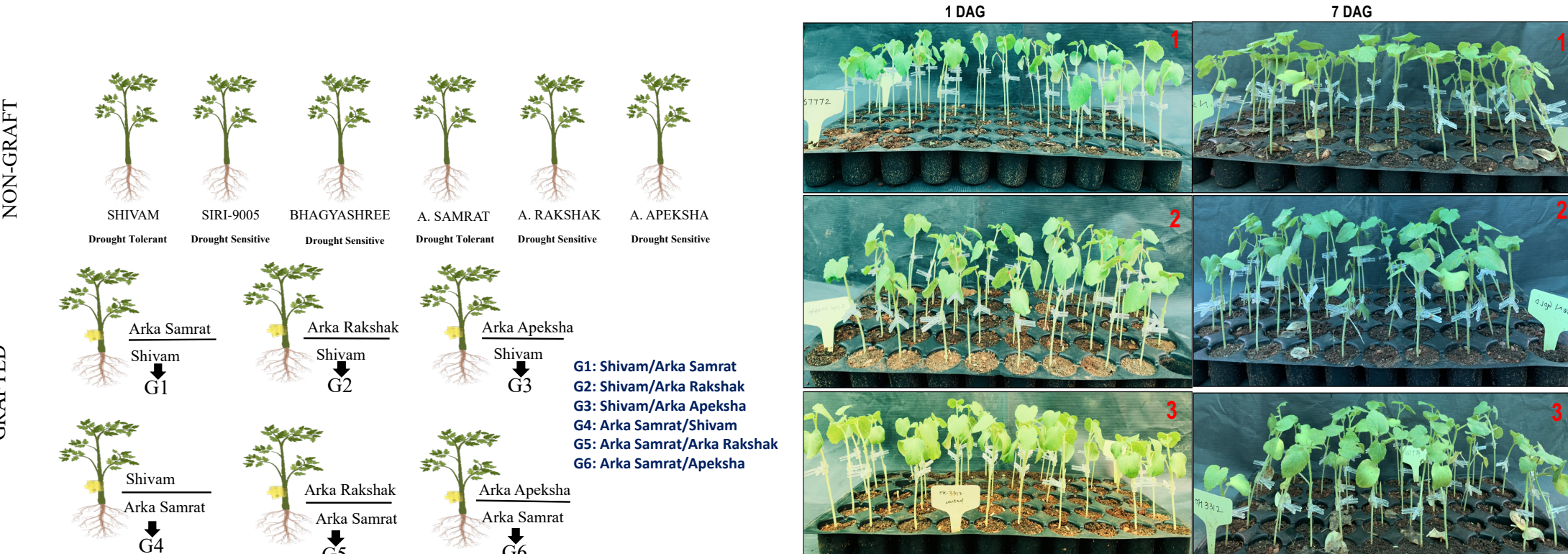
These challenges necessitate the adoption of innovative technologies, including AI and automation, to achieve sustainable and efficient agricultural practices

### METHOD

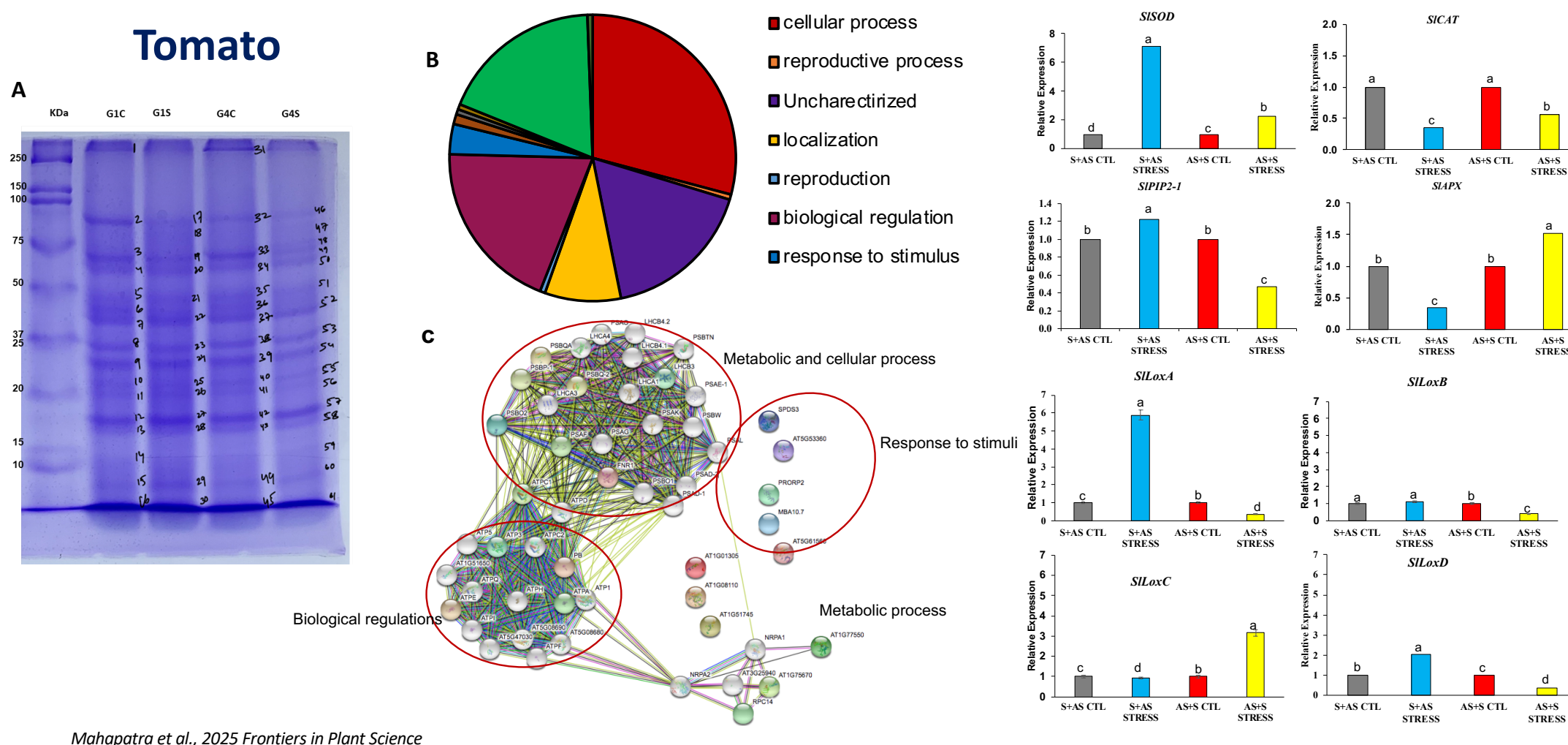
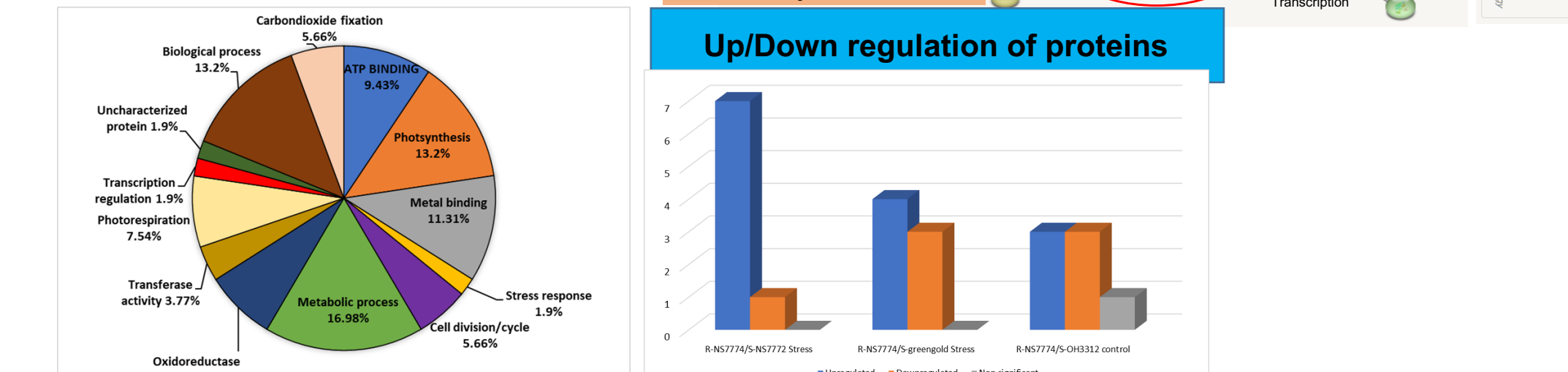
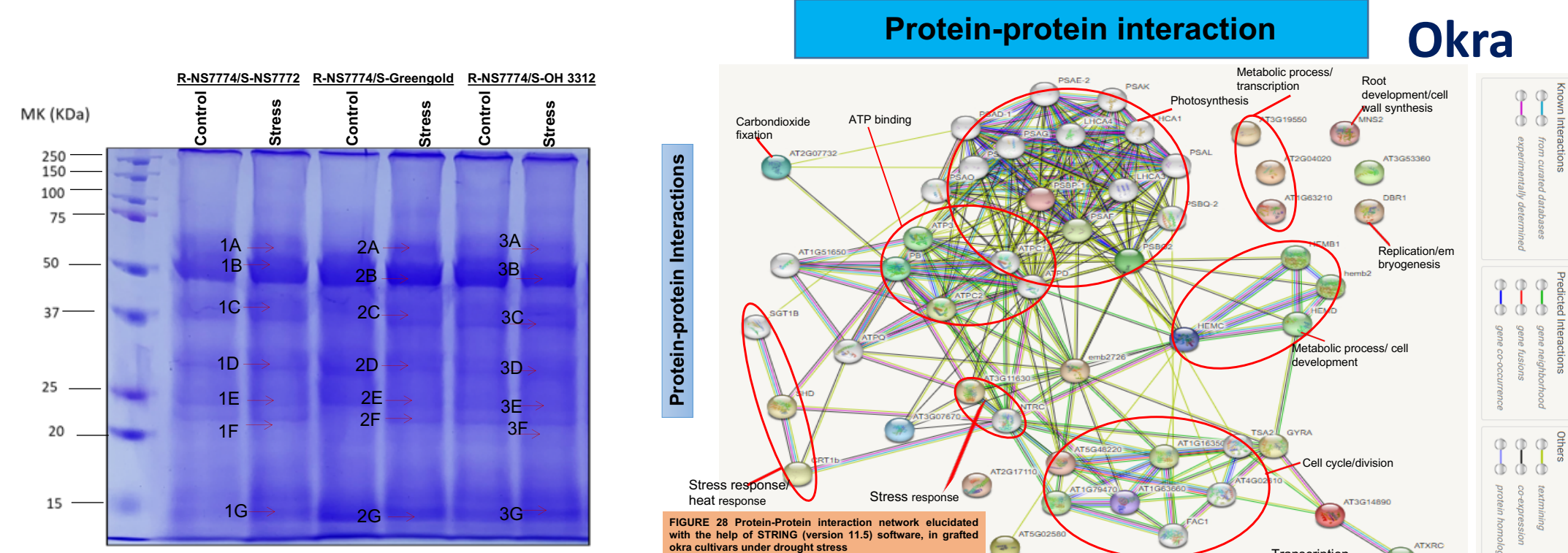
Okra



Tomato

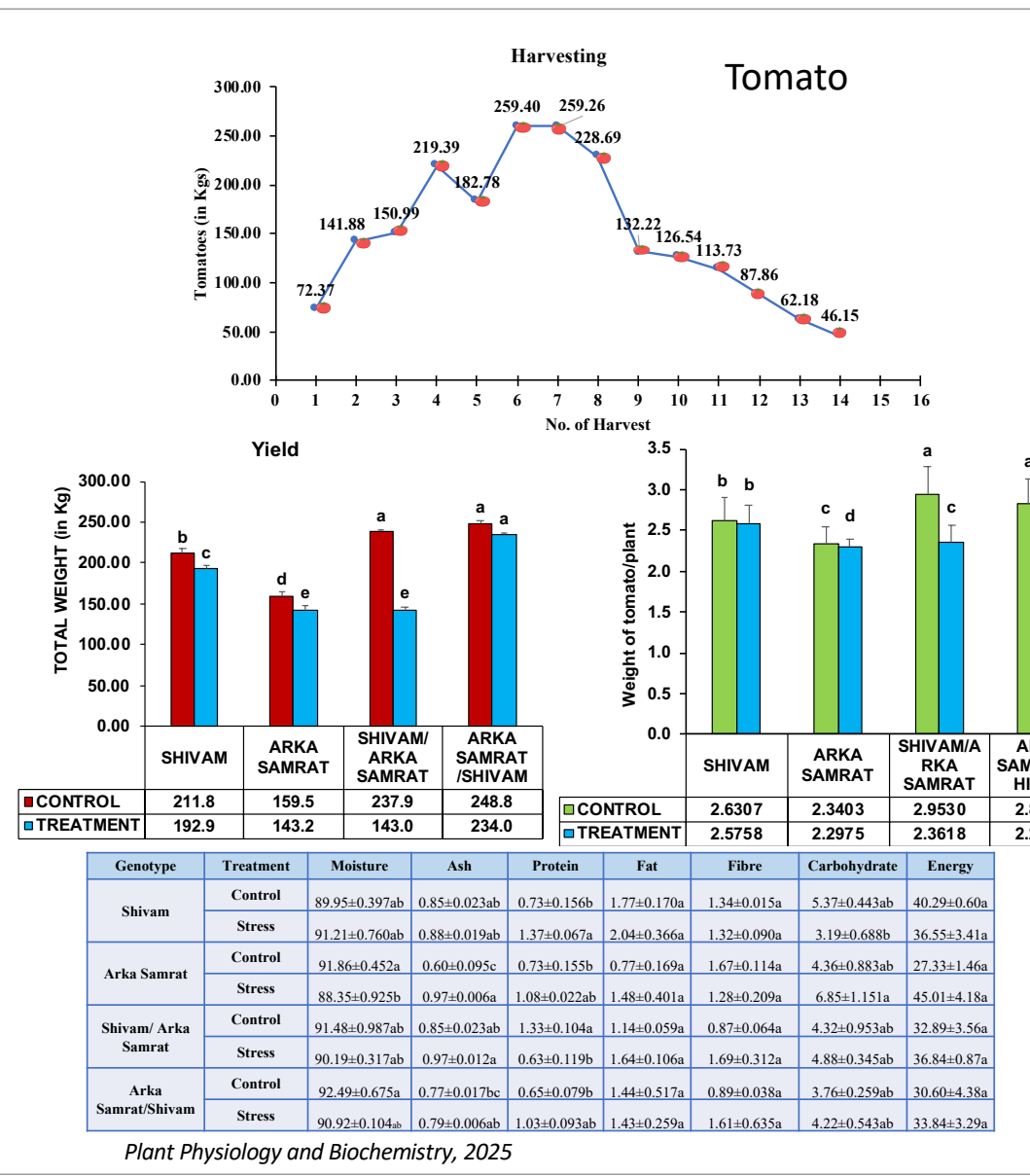


### RESULTS & DISCUSSION



Non grafted	Okra
	NS7774    NS7772    Green gold    OH 3312
Fruit diameter(mm)	16.51 <sup>a</sup> 14.1 <sup>a</sup> 14.8 <sup>b</sup> 14.23 <sup>ab</sup>
Shoot height (cm)	155 <sup>a</sup> 141 <sup>a</sup> 145 <sup>c</sup> 149 <sup>a</sup>
Stem diameter (cm)	6.5 <sup>a</sup> 6.3 <sup>b</sup> 6 <sup>a</sup> 6.2 <sup>a</sup>
Total no of fruits	40 <sup>a</sup> 32 <sup>b</sup> 32 <sup>a</sup> 33 <sup>b</sup>
Length of pod (cm)	10.54 <sup>a</sup> 8.19 <sup>b</sup> 8.68 <sup>b</sup> 9.2 <sup>ab</sup>
No of seeds per fruit	47 <sup>a</sup> 43 <sup>b</sup> 33 <sup>a</sup> 39 <sup>a</sup>
Total yield (g)	985 <sup>a</sup> 817 <sup>a</sup> 692 <sup>a</sup> 761 <sup>bc</sup>

Grafted	R- NS7774 / S- NS7772	R-NS7774 / S-green gold	R-NS7774 / S- OH 3312
Fruit diameter(mm)	17.9 <sup>a</sup>	15.57 <sup>c</sup>	16.12 <sup>b</sup>
Shoot height (cm)	161 <sup>a</sup>	151 <sup>c</sup>	155 <sup>b</sup>
Stem diameter (mm)	8.2 <sup>a</sup>	7.1 <sup>b</sup>	6.9 <sup>bc</sup>
Total No of fruits	75 <sup>a</sup>	49 <sup>cd</sup>	5 <sup>b</sup>
Length of pod (cm)	14.68 <sup>a</sup>	11.01 <sup>b</sup>	11.51 <sup>b</sup>
No of seeds per pod	61 <sup>a</sup>	47 <sup>b</sup>	53 <sup>b</sup>
Total yield (g)	1520.6 <sup>a</sup>	1223.7 <sup>c</sup>	1274 <sup>b</sup>



### CONCLUSION

- Grafting has increased the yield attributes under drought stress conditions than non-graft genotype
- Proximate analysis and shelf life of fruits also has been increased in grafted tomato and okra fruits Compared to non graft genotype
- Grafted seedlings can be introduced to nearby farmers for higher yield

### FUTURE WORK / REFERENCES

- Razi and Muneer 2021. Drought stress-induced physiological mechanisms, signaling pathways and 2 molecular response of chloroplasts in common vegetable crops. Critical reviews in Biotechnology.
- Razi et al 2021. Target-Based Physiological Modulations and Chloroplast Proteome Reveals a Drought Resilient Rootstock in Okra (*Abelmoschus esculentus*) Genotypes. International journal of molecular sciences .