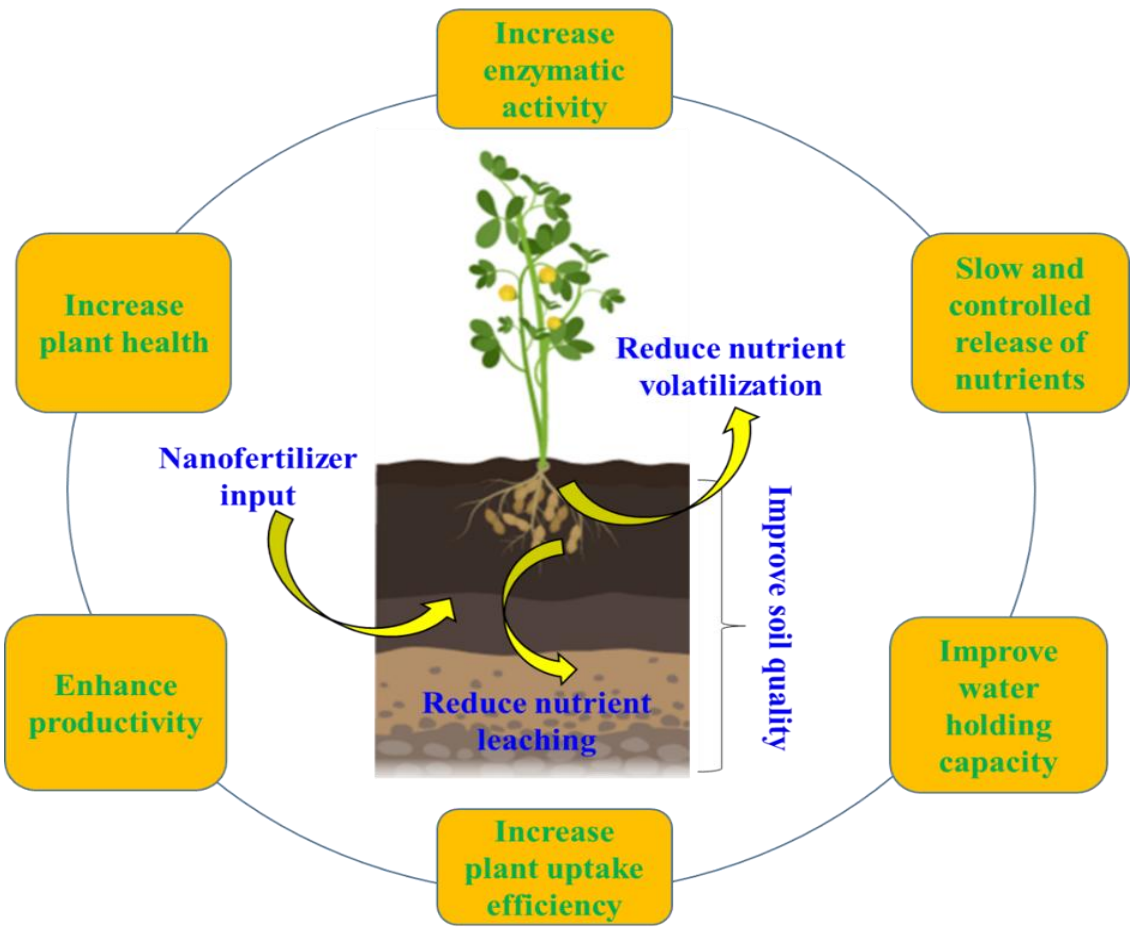
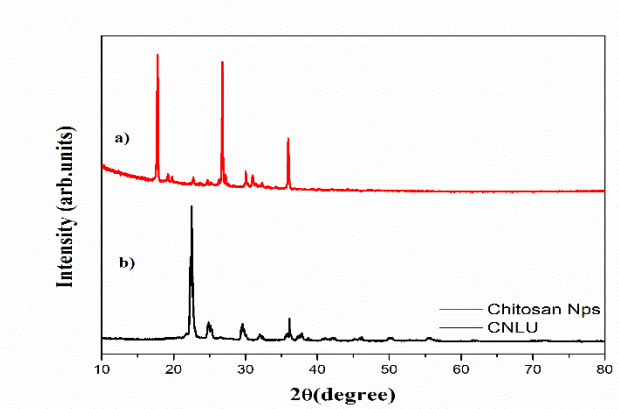


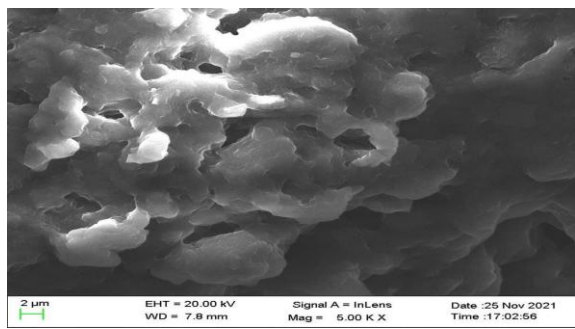
Background problem and Introduction



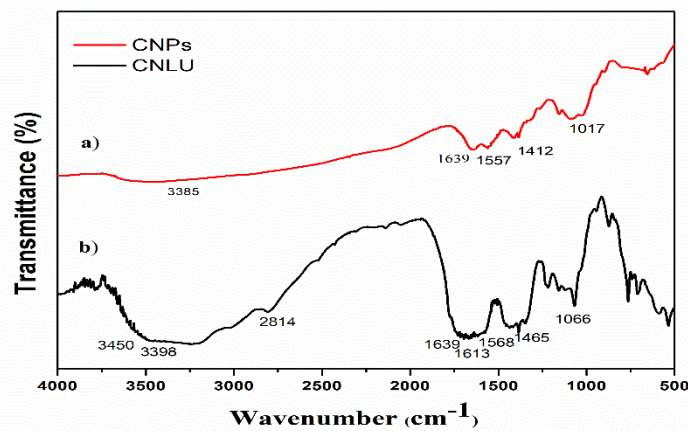
Characterization



XRD



FESEM



FTIR

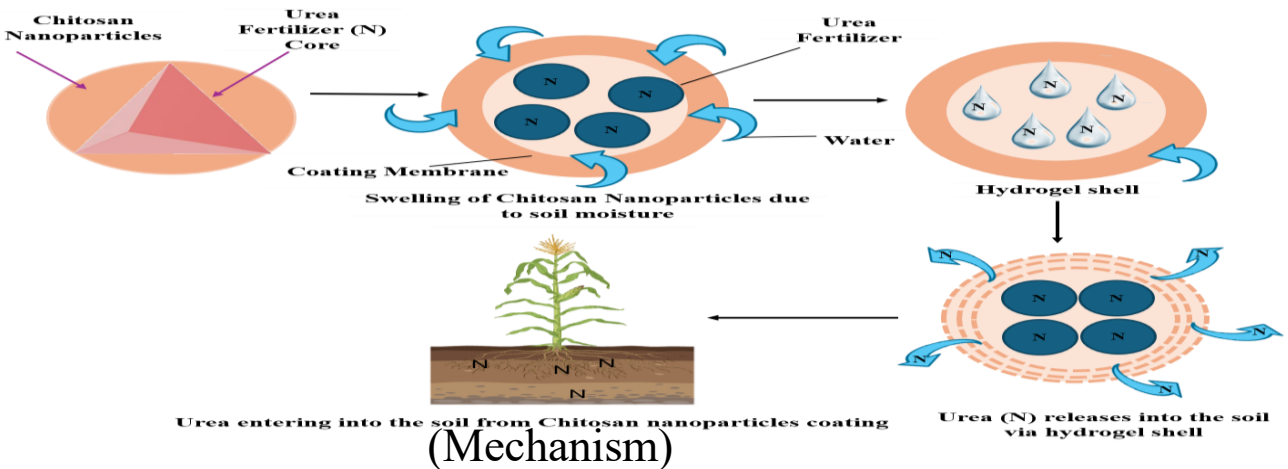
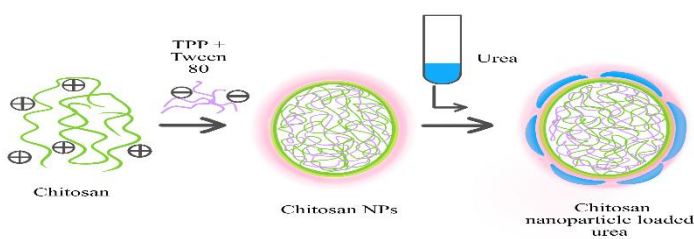
- ❖ The slight shifting of N-H bands in CNLU suggests that there is significant interaction between the urea and the chitosan molecules most likely through carbonyl and amine groups.
- ❖ CNLU displays crystalline reflections of chitosan at $2\theta = 17^\circ, 20^\circ, 24^\circ, 29^\circ, 34^\circ$, as well as urea, indicating the presence of urea in chitosan..
- The surface coating of nanourea is rough, disorganized and have very small pores into it. The chitosan deposits in several agglomeration forms serves as a physical barrier .

Results

Total Phenolic Content, DPPH scavenging activity, protein, TSS, proline, and Nitrogen content

S. No	Concentration (mg/Kg)	Total Phenolic Content (mg GAE/g)	Free Radical Scavenging activity (μg/g)	Protein (μg/g)	Total Soluble Sugars (mg/g)	Proline Content (mg/g)	Nitrogen content (mg/g)
1	Commercial urea @5	172±2.08a	51±3.21a	96±3.2a	108±2c	88±1.5c	2.16±0.2a
2	CNLU @1	215±1c	95±4.35c	108±1.3c	91±1.5a	70±1.1a	2.6±0.3b
3	CNLU @3	206±0.57b	74±4.16b	102±1.1b	95±1.5b	73±1.5ab	3.36±0.3c
4	CNLU @5	192±1b	71±1b	101±6.5b	98±1b	75±1.7b	4.2±0.1d

Synthesis



Conclusion

- The present study investigates the potential efficacy of CNCU as an environmentally friendly slow-release nitrogen fertilizer on *Zea mays* L.
- The efficacy of CNCU was compared with commercial urea at different doses and 1 mg/g of CNCU showed best results.
- The pot studies further confirmed that the application of CNCU enhances the growth and development of *Zea mays* L., showing higher values for germination percentage and index, plant height, biomass, and chlorophyll as compared to bare NU and commercial urea.
- Furthermore, the protein and total phenolic content and free radical scavenging activity were also observed to be highest in plants fertilized with CNCU.
- The findings imply that coating nano-urea with chitosan could not only improve the plant's growth, acting as a slow-release fertilizer, but also help in mitigating the environmental issues associated with the use of conventional urea.