Supplementary data

An Overview of Climate Change Impacts on Agriculture and their mitigation strategies

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Suppl. Table S1: Physiological and biochemical responses of plants upon abiotic stresses

Sr. No	Parameter	Crop	Physiological & biochemical responses to stress	Ref.
1	Heat stress (32 °C)	Tomato	Decrease in fruit yield, increase in antioxidant content in leaf and fruit	[1]
2	Heat Stress (35°C/25°C : day/night)	Lamb's Lettuce	Decrease in plant biomass and photosynthetic pigments, accumulation of high H2O2 in leaf	[2]
3	Salinity Stress (75mM NaCl)	Rice	Depletion in cellular water content, higher accumulation of Na+, decrease in photosynthetic pigments Chl a and Chl b, Activation of aquaponic genes	[3]
4	Heat stress (35-42 °C)	Rice	Decrease in seedlings growth and chlorophyll content, decrease in survival rate by 18-20%, increase in percentage of injury	[4]
5	Heat stress (38 °C/ 31 °C : day/night)	Wheat	Changes in rate of evapotranspiration, increased plants wilting, increase water loss in tissues, decrease in volume	[5]
6	Low temperature stress (9 °C/ 5 °C : day/ night)	Cucumber	Increased electrolytes leakage, hydrogen peroxide levels and intracellular concentration of CO2, decrease in relative water content, net photosynthetic rate, rate of transpiration, stomatal conductance, and leaf pigments	[6]

7	High CO2 levels	Wheat (heat tolerant genotype)	Decrease in lysine metabolism, and metabolites including N acetylonithine, overall yield did not improved	[7]
8	Elevated CO2 levels	Barley	Decrease in specific leaf area and stomatal conductance, decrease in transpiration rate	[8]
9	Salinity stress (150-300mM NaCl)	Sugarcane	Decrease in photosynthetic rate, stomatal conductance and photoassimilate transportation from leaves to other plant tissues	[9]
10	Salinity stress (250mM NaCl)	Soybean	Decrease in photosynthetic pigments, carbohydrates, phenolic content, flavonoids and antioxidants	[10]
11	Salinity + Heat Stress (75mM NaCl + 30 C/ 26 C : day/ night)	Rice	Reduced dry and fresh weight of shots, reduced relative water content of leaves	[3]

Suppl. Table S2: Effect of Biochar on crops and soil properties

Sr. No.	Type of Biochar	Crop	Treatment effect on soil	Treatment effect on crops	Ref.
1.	Pine needle Biochar	Chick pea	Treatment resulted in elevated water holding capacity, Buffered the soil pH to 6.5	Increase in Biomass and plant fresh weight	[11]
2.	Corn stalk Biochar	Sugar Beet	Reduction in soil fomesafen residues by 29-46%, increase in soil pH by 3.49%, increase in soil water content by 13. 8%, increase in soil nitrogen, potassium, soil organic matter by 9.68, 17.7 and 11.8%	Increase in growth, development and photosynthetic content of crop	[12]
3.	Sunflower Biochar	Millet	Increased soil water content by 47%, increased soil dissolved organic carbon by 90% and nitrogen by 74%	Increased plants nutrients sodium, potassium and phosphorus, increased leaf relative water content by 40%, improved overall yield by 58%	[13]

4.	Sunflower Plate Biochar	Rice	Increased soil pH and pH buffering capacity, reduced the available Cd content of soil	Reduced the potential risk of cadmium absorption by rice plants	[14]
5.	Biochar-Fertilizer	Chinese Cabbage	Increased the inorganic nitrogen content of soil	Increased leaf length, width and leaf number. Increased the nitrogen utilization efficiency, amino acids, sugars and vitamin C content	[15]
		Maize		Increased plants height, stem diameter, ear height and starch content of grains	

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