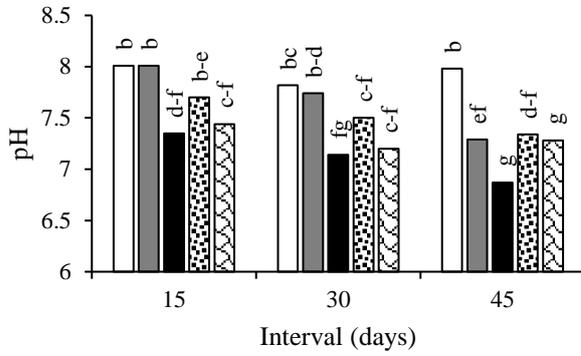
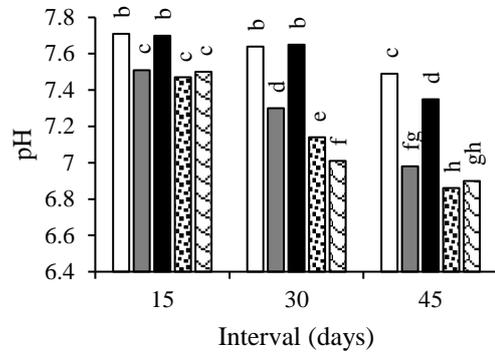


List of figures

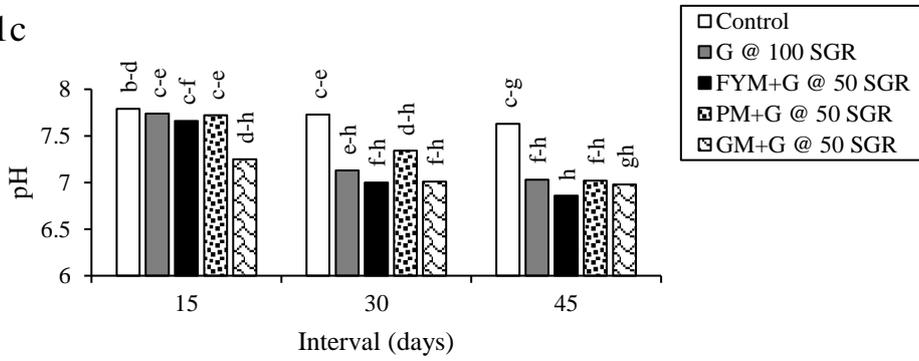
1a



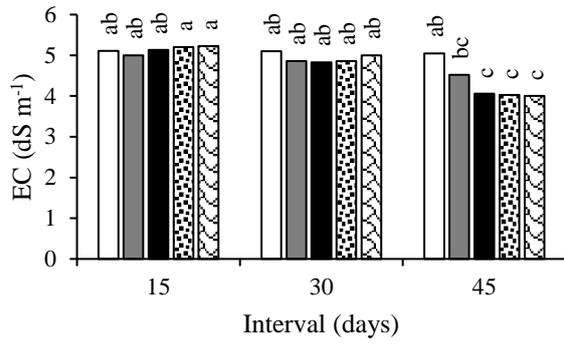
1b



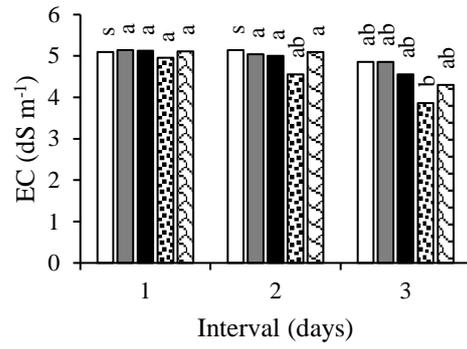
1c



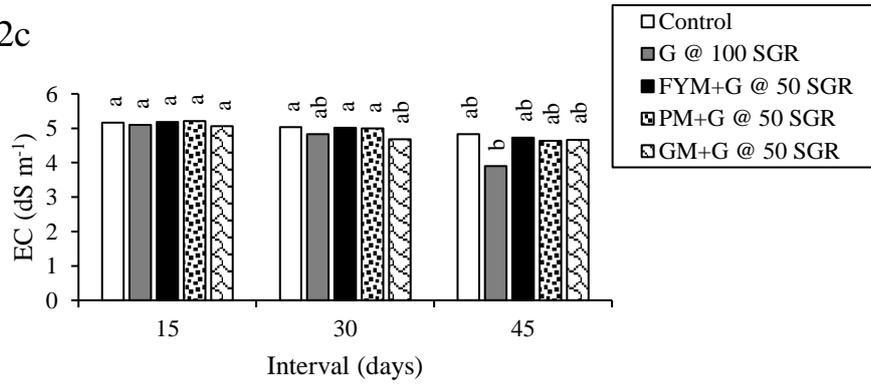
2a



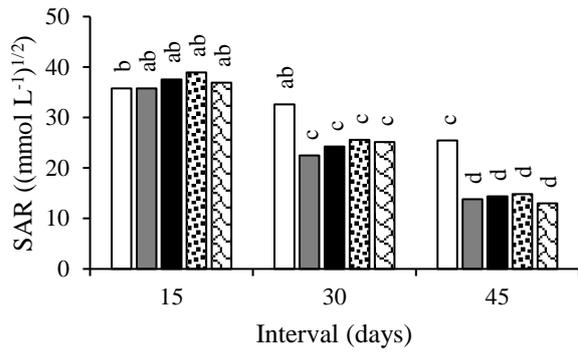
2b



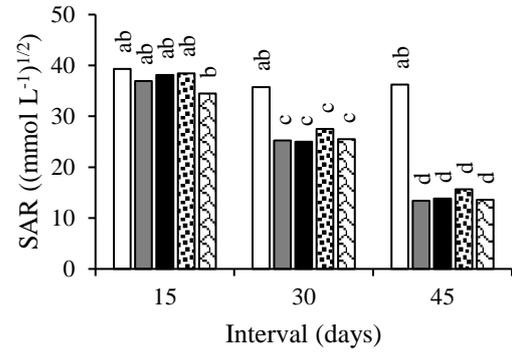
2c



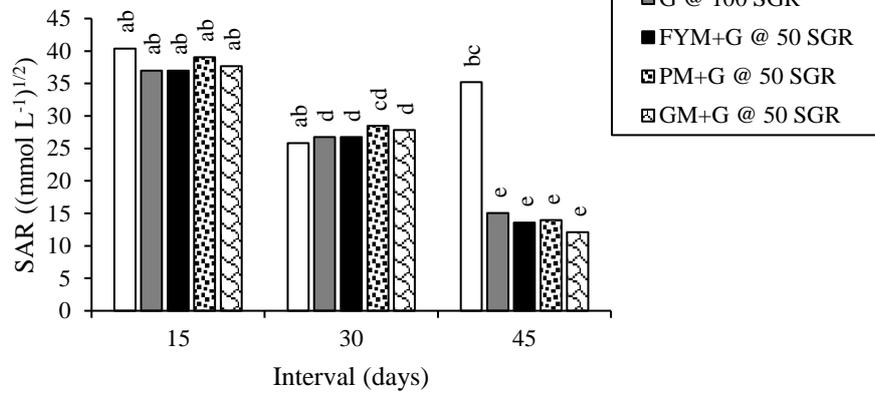
3a



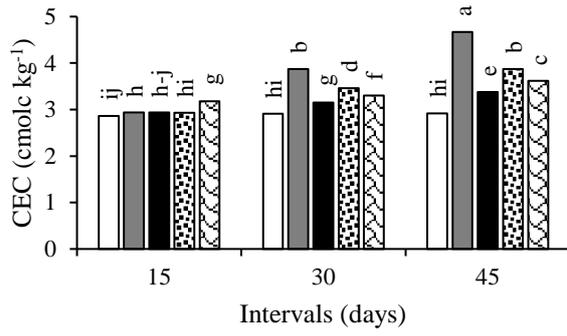
3b



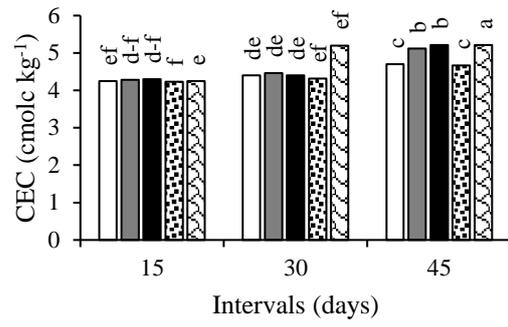
3c



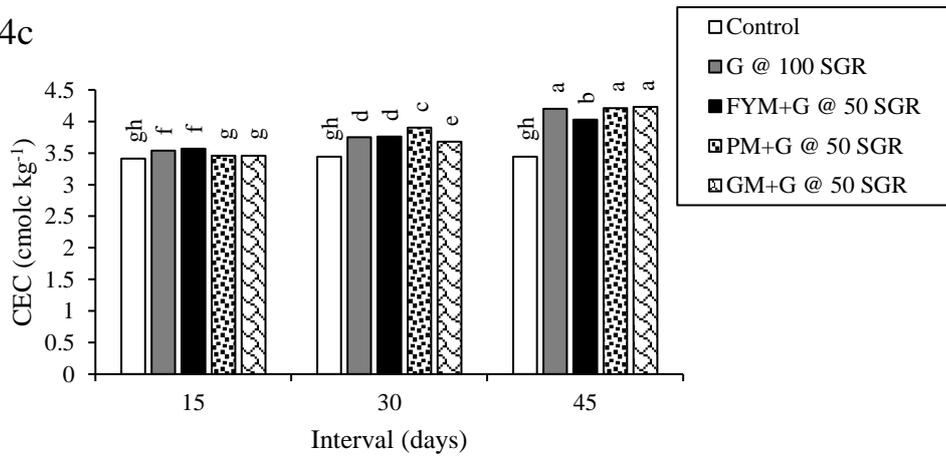
4a



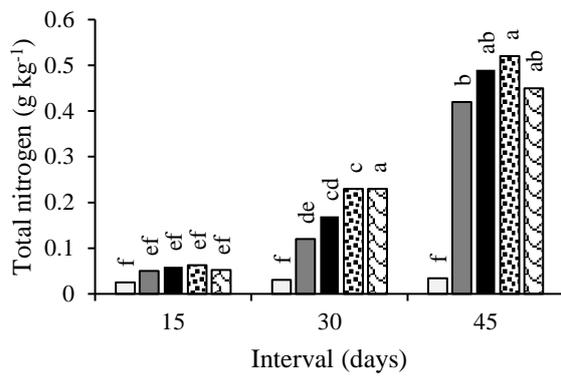
4b



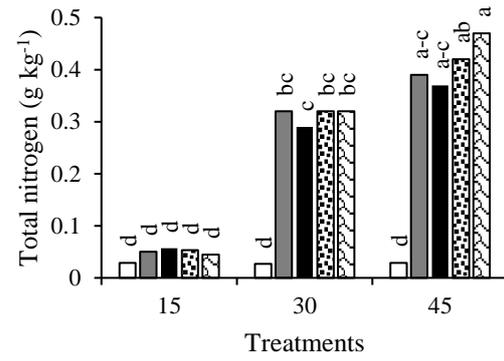
4c



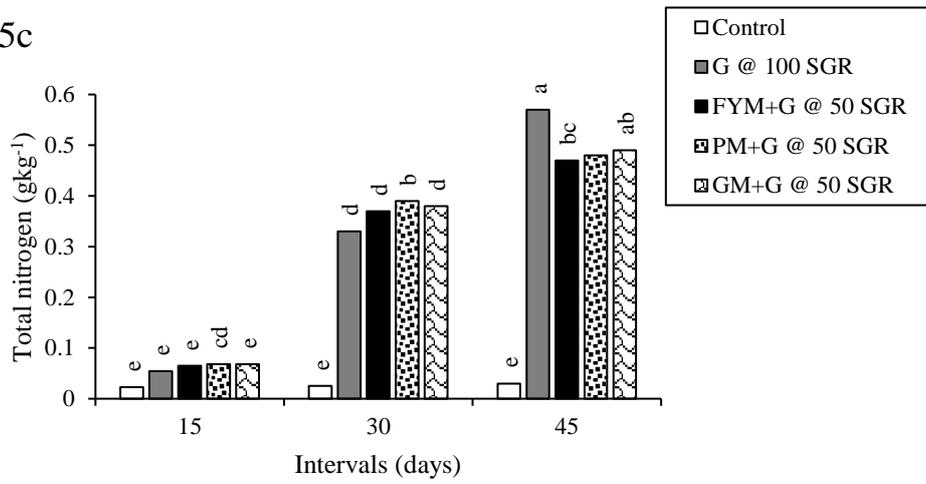
5a



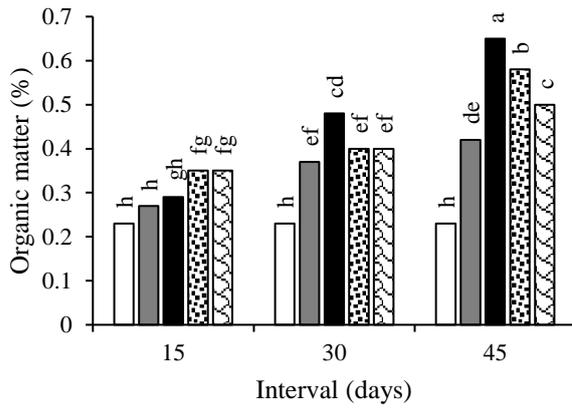
5b



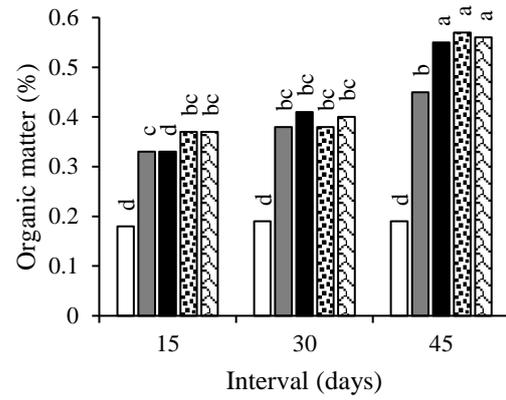
5c



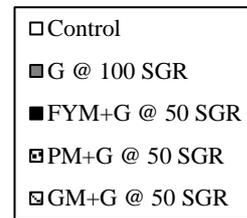
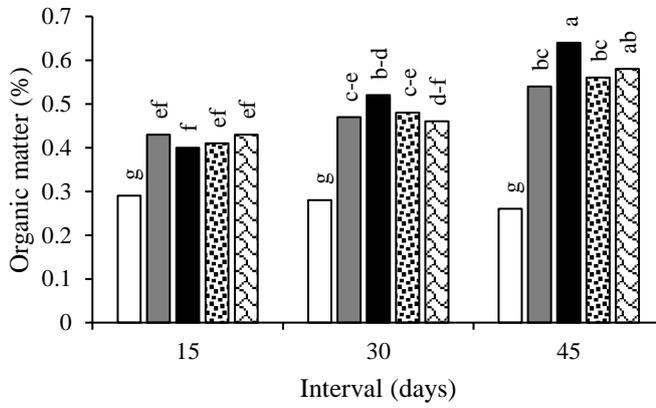
6a

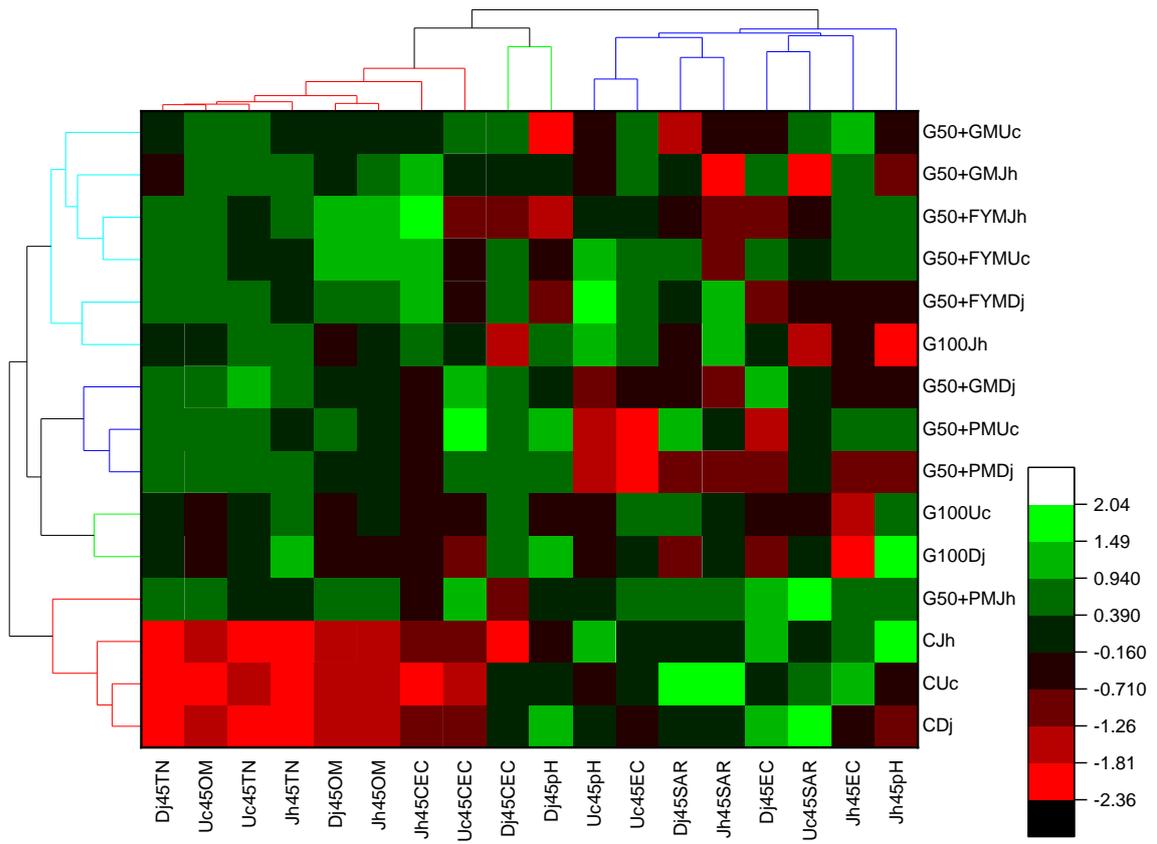


6b



6c





**Fig. 1** Temporal variations in soil pH of Dijkot (1a), Uchkera (1b), and Jhang (1c). Values annotated with different letters are significantly different among treatments at  $p < 0.05$ .

**Fig. 2** Temporal variations in soil EC of Dijkot (2a), Uchkera (2b), and Jhang (2c). Values annotated with different letters are significantly different among treatments at  $p < 0.05$ .

**Fig. 3** Temporal variations in soil SAR of Dijkot (3a), Uchkera (3b), and Jhang (3c). Values annotated with different letters are significantly different among treatments at  $p < 0.05$ .

**Fig. 4** Temporal variations in soil CEC of Dijkot (4a), Uchkera (4b), and Jhang (4c). Values annotated with different letters are significantly different among treatments at  $p < 0.05$ .

**Fig. 5** Temporal variations in soil TN of Dijkot (5a), Uchkera (5b), and Jhang (5c). Values annotated with different letters are significantly different among treatments at  $p < 0.05$ .

**Fig. 6** Temporal variations in soil OM of Dijkot (6a), Uchkera (6b), and Jhang (6c). Values annotated with different letters are significantly different among treatments at  $p < 0.05$ .

**Fig. 7** Pearson's correlation coefficients and dendrogram showing the effects of applied treatments on soil physico-chemical properties. **Horizontally**, DpH=pH in Dijkot, UpH=pH in Uchkera and JpH=pH in Jhang, DEC=EC in Dijkot, UEC=EC in Uchkera, and JEC=EC in Jhang, DSAR=SAR in Dijkot, USAR=SAR in Uchkera, JSAR=SAR in Jhang, DCEC=CEC in Dijkot, UCEC=CEC in Uchkera, JCEC=CEC in Jhang, DTN=total nitrogen in Dijkot, UTN=total nitrogen in Uchkera, JTN=total nitrogen in Jhang, DOM=organic matter in Dijkot, UOM=organic matter in Uchkera, JOM=organic matter in Jhang. The green color indicates strong positive correlation (at  $p < 0.05$ ), light green color showing weak positive correlation among parameters whereas brown color showing strong negative correlation and mustard color indicates weak negative correlation among the parameters. **Vertically**, CDj=control Dijkot, Cuc=control Uchkera, CDj=control Dijkot, G100Dj=gypsum application @ 100% soil gypsum requirements in Dijkot, G100Uc= gypsum application @ 100% soil gypsum requirements in Uchkera, G100Jh= gypsum application @ 100% soil gypsum requirements in Jhang, G50+FYMDj=gypsum application @ 50% soil gypsum requirements+ farmyard manure in Dijkot, G50+FYMUc= gypsum application @ 50% soil gypsum requirements+ farmyard manure in Uchkera, G50+FYMJh= gypsum application @ 50% soil gypsum requirements+ farmyard manure in Jhang, G50+PMDj=gypsum application @ 50% soil gypsum requirements+ poultry manure in Dijkot, G50+PMUc=gypsum application @ 50% soil gypsum requirements+ poultry manure in Uchkera, G50+PMJh=gypsum application @ 50% soil gypsum requirements+ poultry manure in Jhang, G50+GMDj=gypsum application @ 50% soil gypsum requirements+ green manure in Dijkot, G50+GMUc=gypsum application @ 50% soil gypsum requirements+ green manure in Uchkera, G50+GMJh=gypsum application @ 50% soil gypsum requirements+ green manure in Jhang.