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Research note :

Rapid appraisal of salinity for the soils of Porbandar, Gujarat

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Seventy three surface (0-15 cm) soil samples were collected from the cultivated soils of Porbandar district, and were analyzed for EC and pH from saturation extract and 1:2.5 soil water ratios. The results revealed highly significant correlations between ECe and $EC_{2.5}$ and between pHs and $pH_{2.5}$. High correlation coefficient (r) and regression coefficient (b), high percentage of variance (R^2) in case of $EC_{2.5}$ and $pH_{2.5}$ were observed and hence, prediction of ECe from $EC_{2.5}$ and pHs from $pH_{2.5}$ with greater precision was possible by using the regression equation for the soils of Porbandar district.

Soil salinity can be categorized by determining electrical conductivity (dSm^{-1}) and pHs of saturation extract of the soil, which is a time consuming, laborious and expensive process. Contrary to this determination of EC and pH from various dilute soil:water extract is rapid and inexpensive. High degree of correlation has, however, been obtained between ECe and EC and pHs and pH of dilute solutions of the salt affected soils (Polara *et al*., 2004; Kabaria *et al.*, 2006), which needs to be validated for the soils of coastal Porbandar district of Gujarat. With a view to rapidly appraise the salinity using EC of 1:2.5 soil water aqueous extracts of coastal soils of Porbandar district, present investigation was undertaken.

Twenty surface (0-15 cm) soil samples from Kutiyana, 11 from Ranavav and 42 from Porbandar talukas of Porbandar district were collected from the cultivated fields during May-2004 and were subsequently analyzed for EC and pH from saturation extract (ECe and pHs) of the soil and from 1:2.5 soil water extract using standard methods (Richards, 1954). The regression equation for ECe and pHs was calculated from the analyzed values of 67 samples from three talukas of Porbandar district. In order to test validity of the developed equation, the values of EC and pH from saturation extract and from 1:2.5 soil water extract of rest of the two samples each from Kutiyana, Ranavav and Porbandar talukas(6 samples) were evaluated using χ^2 test.

The data presented in Table 1 indicate highly significant correlation coefficient between ECe and EC of 1:2.5 soil water extracts for the soils of three talukas of Porbandar district. It was observed that the regression coefficient (b value) between ECe and EC of 1:2.5 soil water extracts were highly significant. Similar results were also observed between pHs and pH of 1:2.5 soil water extract. These results are in direct line with those reported by Patel and Patel (1992) for the Bhal-Nal soils, Polara *et al*. (2004) for the soils of north-west agro-climatic zone of Gujarat and Kabaria *et al*. (2006) for the soils of Coastal Amreli district of Gujarat.

The χ^2 test of six data set of observed and expected values of ECe and pHs were nonsignificant (Table 2) suggesting the goodness of fit of regression equation. Similar results were also observed for pHs. The expected values derived from the

Table 1 : Regression equation and correlation coefficient between $EC_{2.5}$ and $pH_{2.5}$ with ECe and pHs and their statistical test of significance

Regression equation (Y=a+bx)	Correlation coefficient (r)	Coefficient of determination (%)	Standard error of estimate (S.E. of byx)
$ECe=0.681+2.710^{**}EC_{2.5}$	0.987*	97.5	0.686
$pHs=-2.174+1.245^{**}pH_{2.5}$	0.885	78.3	0.113