

Management of acid soils in NEH Region

Area:

❖ Out of 25 m.ha of problematic acid soils of India with below pH 5.5, NE region represents 54% of the total area whereas, it occupies only 8% of the total geographical area.

Causes of soil acidity

- ❖ Natural process: high rainfall, acidic parent material, type of vegetation
- ❖ Human induced: Soil erosion accompanied by loss of top fertile acidic soils and exposure poor fertile subsoil. In few pockets acidity is also induced by application of nitrogenous fertilizers

Problems

- ❖ Toxicity of aluminium mainly
- ❖ Deficiency of bases (calcium , magnesium and potassium)
- ❖ Low availability of phosphorus caused by the high fixation capacity of soil
- ❖ Reduction of soil biological activities
- ❖ Impairment of nitrogen fixation by legumes and deficiency of molybdenum
- ❖ Iron and manganese toxicities in submerged soils

Management

- ❖ Liming of acid soils to raise the soil pH to 5.5 to neutralize toxic aluminum i.e. make the soil to suit the plant
- ❖ Growing of acid tolerant plants: select the plants to suit the acid soil condition
- ❖ Breeding of acid tolerant crops especially pulses, oilseeds and cereals

Technology available

- ❖ Ready Reckoner for acid soils to raise soil pH to 5.5 by liming
- ❖ Application of 500 kg lime in furrows to each crop
- ❖ Tolerant plants: pineapple, coffee, tea, rubber, sweetpotato, casava, potato, rice, pigeonpea, fingermillet, buckwheat, ricebean, colocasia, allocasia, ginger, turmeric, etc.

Extend of acid soils in NE region					
States	pH <5.5	pH, 5.5-6.5	Total acid soil	Geog. area	% G. area of acid soil
Arunachal Pradesh	6.52	0.27	6.79	7.786	81.08
Assam	2.33	2.33	4.66	7.844	59.41
Manipur	1.87	0.32	2.19	2.233	98.07
Meghalaya	1.19	1.05	2.24	2.243	99.87
Mizoram	1.27	0.78	2.05	2.208	97.20
Nagaland	1.60	0.05	1.64	1.658	99.50
Sikkim	0.60	-	0.60	0.710	84.51
Tripura	0.81	0.24	1.05	1.049	100.00
Total NE	16.19	5.04	21.23	26.219	80.97
India	30.00	58.94	89.95	328.726	27.36
% NE of India	53.97	8.41	23.60	7.97	6.45



Lime requirement of soils to achieve the pH 5.5 as affected by pH, organic matter and clay content of soils (t/ha)*.

Soil pH	Organic matter, 2%				Organic matter, 4%				Organic matter, 6%				Organic matter, 8%			
	Clay (%)				Clay (%)				Clay (%)				Clay (%)			
	10	15	20	25	10	15	20	25	10	15	20	25	10	15	20	25
4.5	3.56	3.83	4.11	4.39	3.72	4.00	4.28	4.56	3.89	4.17	4.44	4.72	4.05	4.33	4.61	4.89
4.6	3.15	3.42	3.70	3.98	3.32	3.59	3.87	4.14	3.49	3.77	4.04	4.32	3.66	3.93	4.21	4.49
4.7	2.74	3.01	3.29	3.60	2.91	3.18	3.34	3.62	3.08	3.36	3.63	3.91	3.24	3.52	3.80	4.08
4.8	2.25	2.53	2.81	3.09	2.42	2.70	2.98	3.26	2.59	2.87	3.14	3.42	2.76	3.03	3.31	3.59
4.9	1.93	2.22	2.49	2.75	2.10	2.38	2.66	2.93	2.27	2.54	2.82	3.10	2.43	2.71	3.00	3.27
5.0	1.52	1.80	2.08	2.35	1.69	1.97	2.24	2.52	1.86	2.13	2.41	2.69	2.02	2.30	2.58	2.86
5.1	1.11	1.40	1.68	1.94	1.29	1.56	1.84	2.12	1.46	1.73	2.01	3.29	1.62	1.90	2.18	2.46
5.2	0.71	1.00	1.27	1.56	0.90	1.16	1.43	1.71	0.06	1.33	1.61	1.90	1.22	1.50	1.78	2.06
5.3	0.31	0.59	0.86	1.13	0.48	0.76	1.03	1.31	0.64	0.92	1.20	1.48	0.81	1.09	1.37	1.64
5.4		0.18	0.44	0.72	0.07	0.34	0.62	0.90	0.23	0.51	0.82	1.10	0.40	0.68	0.96	1.23

•Agricultural dolomitic limestone passed through 100-mesh sieve and average neutralizing power 90% equivalent to pure limestone.