# Studies on reclamation of sandy soils

## AbdeI Moniem Abd El Magid El Toukhy

Conditioning the soils means improving their physical and chemical properties by the use of natural or synthetic substances.The current work is carried out to investigatethe possibility of using so11 conditioners and theirrole in developing better physical and chemical propertiesof sandy soila. AlsO, to compare the effect ofsoil conditioners on the properties of sandy Boll withthose brought about due to the addition of shales andnatural organio compounas.A sandy 8011 from an area adjacent to the westernside of Cairo-Alexandria Desert Road (at the kilometer.25 from Cairo), was-investigated.A green house experiment with peanut a8 indicatorplant was conduoted to study the effect of curaeol AI,planterra, superhumas, polyvinyl alcohol, polyaorylamide,bentonite and shales on seed germination. Ofthese r~terials, curseol AB, planterra, shale., f~--yard tnQDure and gTben manure (Egyptian cyspan andalfalfa) were 1nve.tigated in a field experiment.Results obtained can be summarized .a follo.asI. PreliminarY green house:Seed germination:Conditioners used tended to delay germination anddecrease its percentage as compared to the untreatedsandy soil. HyDROPhobic oonditioner, (curasol AE) didnot materially del$Y the germination process, 8S thenumber of germinated seeds were similar to those of thecontrol treatment after three weeks of germina'tion.HyDROPhilio soil condItioners (PAM, PYA and shales)beside decreasing germination percentage, aleo increasedthe time needed for germination especially whenapplied at the hip.h conoentration. Delaying eerminationand/or decreasing the germination peroentage seemsto be related to the hyDROPhobicity or hyDROPh11ioit7of the added soil conditioner.II. Field experimentA. Physical properties:(1) Treating the sandy so11 with the. oonditioners orcultivating it with Egyptian cyspan and/or alfalfa,d3creased the values of bulk density in the so11eepec1ally at the surface layers, and consequentlythe void ratio and total porosity were inoreased.(2) The effect of conditioners on the fOrmation ofstable aggregates could be arranged in the following decreasing order: cura.ol ~:>shales).planterra> tarrqard manure. Increasing stableagare&at •• of 84~. in diameter decreased erosioDindex due to the incresse of non-erodiable olod.forlDatio~.() Maximumwater holding capacity of ihe so11 retention(1.e. at Pp.o) was increased with the applicationot .011 conditioners and with cultivation.This 1ncl ••se was ~ore pronounoed with increas1nsth, rate of applied materials.(4) Th. apPtloatloD of ourssol AE (hyd:Ophoblc) atthe tllghelt rate (lJ) reduoed the ,.mount at availablewater. Tn- rever •• was tr~. in bOth oa.'.of hyDROPh1110material' and oultivation.'.5) Values of the b.YClfaul1c oonductivity and the Int1l-'trat1on rate ot 8C4y sot18 conditioned. with curaeol1IJI el.nowed an 1nol'••••• wh10h l'OI3 be due to the ~rmatlonof lara-&~'aat •• (4-8 .m. in diameter).On the other hand, planterra, ,hal ••• tarDITard andgreen manure d.or •••• d the hydrauli0 oODauot1vit7and infil tl'at1on rate .•allotesa whioh .., be due tobloo~1ng of the wide pore. between sand particle.through lrr1sat1on and/or bl bind1na .~••ralgrains .formiDi aaareaat •• owing to the pre •• noe ottine tr.,ot10111 ud Oll gaIli0 .""er.11' B. Chemioal properties:(1) Addition of curasol AE to the sandy soil increasedslightly its content ot soluble salts. SUchincrease may be resulted from improving the waterrelations of the sandy soil which lead" to a better chance for water retention and consequentlyhigher rate of salt accumulation especiall,. if theirrigation water was of high salt content.. Plantingsandy soil with alfalfa or Egyptian cyspan,slightly decreased the soil content of TSS in bothsurface and subsurface layers, which tllay be attributedto the reduced evaporation rate.(2) SOil organic matter content «as slightly increasedas a result of adding 80il conditioners espeoially when high conc8D~rations were used.(J) CEO of sandy soil tended to inorease alightly, withthe addition ot conditioners and by planting

alfalfaor Eg,yptian cyspan. The applioation of eht.&lesand faI’myard Ql8Ilure increased the solI CEO by factor of about 5~ and 40.” respect1ve17. !headdition ot soil conditioners to sandy 8011 O~planting 1t w1th alfalfa 01” I&yptlan 01.pan, Sl’&-dually improved their content. of I,P an4 X.Prom the o_vious studied one can concluded thathyDROPh!lic conditioners considered more effectivethan the hyDROPhobic condi~ioners in reclam1ng sandy 8011s.