

BAD IRRIGATION WATER CORRECTION

The desertification is an incipient phenomenon involving wide parts of coastal areas all over the world. Such phenomenon consists in the destruction or degradation of vegetative cover soil. This will cause the formation of desert. Generally, this is caused by increased salinity of soil because of intensive crops, drought, deforestation, fire.

In the agricultural areas next to the coasts, subject to fruit and vegetables intensive crops, both in open field and in greenhouses, the irrigation underground waters are undergoing an increasing salinization progressive and irreversible.

This is cause of damages to agricultural production both in qualitative and in quantitative aspect, at same time, such process is causing severe damages also to soils who are drying up and they are losing their fertility.



A module for correction of bad irrigation water
960 mm dia

Because the Sodium level is considered the main responsible of these negative effects, the evaluation of quality for an irrigational water generally is based on SAR index (Sodium Absorption Ratio) which establishes that a good irrigation water is only if it has a SAR index below 6.

$$\text{SAR} = \frac{\text{Na}}{\sqrt{(\text{Ca} + \text{Mg}) / 2}} \text{ in meq.}$$

It was seen that, under certain conditions, some special categories of minerals are capable to perform an interesting ionic exchange in respect of some cationic species, including Sodium. This gives us the possibility to realize some special devices capable to reduce the Na level of irrigation water transforming a bad irrigational water (SAR>6) into a good one (SAR<6).

By use, the mineral used as media in these devices, will be exhausted. For this reason, time by time, will be required a regeneration of the same, by means some low cost chemicals.

CONCLUSION

The selective Sodium removal from irrigational water represents a possibility to treat at very low cost waters not suitable with agricultural usage. The method is compatible with waters which salinity is constituted mainly by Sodium salts and with Sodium level up to 650 ppm.

Under these conditions, such method allows to obtain:

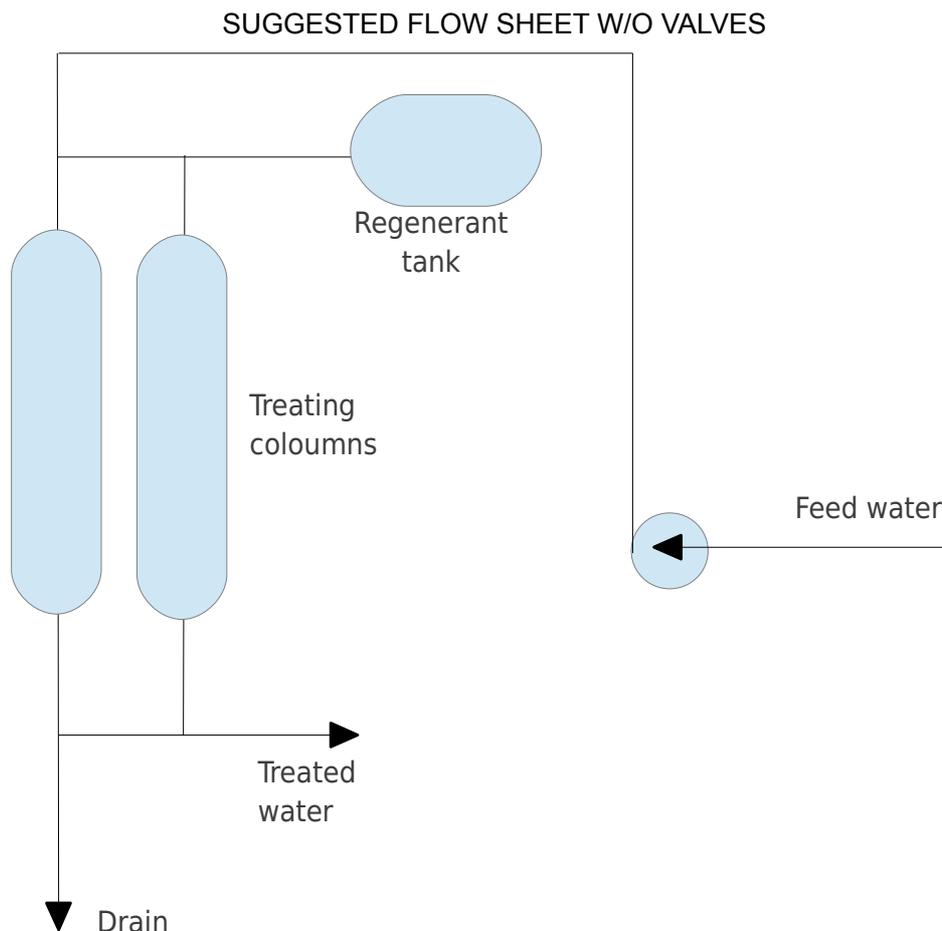
Na up to 250 ppm – SAR up to 7 – Regeneration chemical: NH4

Average Sodium Removal Capability: 4500 ppm/kg of media - Average SAR variation: -20%

Na up to 650 ppm – SAR up to 12 – Regeneration chemical: K

Average Sodium Removal Capability: 5100 ppm/kg of media - Average SAR variation: -52%

Systems based on this method, generally are realized in pairs to have the possibility to regenerate one while the other one is operational.



For water more charged of salts, our Agricultural Desalination systems are preferable because they are capable to remove all contaminants from waters.