河套灌区玉米耐盐性分析及生态适宜区划分

Analysis of maize salt tolerance in Hetao irrigation district and its ecological adaptable region

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中文摘要：

　　为了探讨河套灌区盐碱地玉米对根区土壤盐分的生态适应性，本文基于田间定位观测，运用非线性最小二乘数值逼近法建立玉米耐盐函数模型；同时根据耐盐性分析，提出玉米在该灌区不同生态适宜区的划分标准。结果表明，盐碱地地膜覆盖在生产上有较好的控盐效果，可以使玉米苗期0～10、0～20和0～40?cm土壤盐分分别降低61.2%、53.8%、41.3%，能够增强玉米对盐碱地的生态适应性；分段式耐盐函数模型和S型耐盐函数模型均能较好地反应玉米相对产量对浅层土壤盐分变化的响应关系；浅层0～40?cm土壤盐分作为玉米根层盐分来分析玉米的耐盐性最具代表性，其对应中玉9号玉米的耐盐指数为6.583；根据耐盐性分析，将区域耕地划分为玉米最适宜区、适宜区、次适宜区和不适宜区，对应玉米苗期0～20?cm膜外土壤盐分分别为低于1.178?、1.178～2.036、2.036～3.465和高于3.465?g/kg。本研究将为当地玉米种植合理布局、高效生产提供理论指导。

英文摘要：

　　In order to investigate the ecological adaptability of maize to root-zone soil salinity in Hetao Irrigation District, salt tolerance functions of maize was established based on the located observation in fields and the nonlinear least squares numerical approximation method. Meanwhile, the division standard of different ecological adaptable regions of the maize in Hetao Irrigation District based on the salt tolerance was proposed. The results showed that plastic film mulching in saline land had a good effect on salinity control in production, which reduced 61.2%、53.8% and 41.3% of 0-10、0-20 and 0-40 cm soil salinity in maize seedling, respectively and improved maize ecological adaptability to salinity. Both the piecewise linear response function and the nonlinear S-shaped functions could effectively present the relationship between maize relative yield and electrical conductivity of soil saturation extract. soil salinity in the layer 0-40cm was the most representative of root-zone salinity to maize salt tolerance analysis , and salinity tolerance index of Zhongyu 9 maize was 8.303. According to the salt tolerance, the farm land into the most suitable region, suitable region, sub-suitable region and unsuitable region were divided, where the salinity of 0 to 20cm soil layer out of plastic film in maize seedling respectively were below 1.178, 1.178 to 2.036, 2.036 to 3.465 and exceed 3.465 g/kg. This research can provide theoretical guidance for maize reasonable arrangement and efficient production.

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