

## 土壤压实对土壤物理性质及小麦氮磷钾吸收的影响(英文)

### Effects of soil compaction on soil physical properties and nitrogen, phosphorus, potassium uptake in wheat plants

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中文摘要:

为了研究土壤压实对土壤物理性质以及小麦养分吸收情况的影响,在2006和2007年进行了两轮田间试验。试验中,先用旋耕机对田块进行旋耕,耕深10 cm,然后使用手扶式、轮式、履带式拖拉机在旋耕后的田块中通过1次(T1)、2次(T2)、4次(T3)以对土壤进行压实处理,对照组(T4)不作任何压实处理。压实处理后再次对土壤表层进行浅旋耕,耕深5 cm,耕后用播种机进行小麦播种,小麦品种为南京-601。试验结果发现,次表层土壤的压实处理显著影响次表层土壤的容重,孔隙度,小麦蛋白质含量以及植物中N、P、K的含量。除次表层的土壤容重在T3组中最大,T4组中最小外,其他参数在T4组中最大,T3组中最小。并且,随着次表层土壤压实程度的增加,几乎所有的参数(土壤容重除外)都有所减少。不过,与第一年相比,参数值在第二年略有增加。总之,土壤压实严重破坏土壤结构,不利于小麦对养分的吸收。

英文摘要:

The field experiments were conducted in 2006 and repeated in 2007. The effects of soil compaction on physical properties and nutrient uptake in plants were studied. In the experiments, soil was tilled by rotary tiller at the depth of 10 cm, and compacted by holder/walking tractor, wheel tractor and crawler tractor in one pass (T1), two passes (T2) and four passes (T3), while no compaction (T4) was applied as control. The topsoil (0~5 cm) was re-tilled by rotary tiller; and Nanjing-601 was sown by grain drill. Compaction of the subsurface soil significantly affects subsurface soil bulk density, soil porosity, grain protein content, content of N, P, K in plants (%). The maximum values of above parameters were recorded by T4 and the minimum ones by T3 except subsurface soil bulk density which the maximum value was recorded by T3 and the minimum by T4. Almost all parameters except bulk density of showed a decreasing trend with the increasing of subsurface soil compaction. However, slightly higher values were observed during the second year of experiment as compared to the first year. In a word, soil compaction badly affects the soil structure and unfavorable to nutrient uptake in wheat plants.

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