

不同水分状况对红壤和黄褐土速效钾含量的影响

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Effects of water conditions on available potassium contents in red soil and yellow-cinnamon soil

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摘要 通过120 d的实验室恒温(25±1℃)培养试验,研究了不同水分条件(含水量0、25%和40%及干湿交替)对红壤和黄褐土速效钾(K)变化的影响。结果表明,无论施钾与否,红壤恒湿处理(25%和40%)的速效K高于干燥土壤,并且随着培养时间的延长有增加的趋势;黄褐土与红壤相反,恒湿处理的速效钾低于干燥土壤。同一土壤25%和40%含水量恒湿处理的速效钾含量差异不显著,表明土粒表面水膜的厚薄不是影响土壤钾有效性的控制因素。干湿交替条件下,红壤速效钾变化不明显,黄褐土速效钾逐渐增加,干燥过程可促进黄褐土层间K⁺的释放。随着干湿交替次数的增加,红壤固钾能力有增加的趋势,黄褐土的固钾能力逐渐下降。

关键词: 红壤 黄褐土 土壤速效钾 土壤水分 干湿交替 红壤 黄褐土 土壤速效钾 土壤水分 干湿交替

Abstract:

Water content plays a crucial role in the soil K content and availability. In this paper, laboratory incubated experiments were carried out to study the effects of different water contents (0, 25% and 40%) and alternative drying-wetting condition on soil available potassium (K) change in red soil and yellow-cinnamon soil at a constant temperature (25±1)°C for 120 days. Results show that compared with the control (dry condition), available K in red soil is increased significantly under two constant contents of 25% and 40%, and the increasing trend is increased with incubated time prolonged. While for yellow-cinnamon soil, available K for 25% and 40% water content treatments are lower than that of control. There are not any significant differences for the available K between the two constant contents of 25% and 40% for same soil, which indicate that the water film thickness of soil particle surface might not be the controlling factor to influence potassium availability in soils. Under the alternative drying-wetting condition, available K in red soil is not changed obviously, while available K is increased gradually in yellow-cinnamon soil, which indicates that the drying process promoting the release of inter-layer K of yellow-cinnamon soil. With the increase of times of the dry replace the humid, the K fixation capacity of yellow-cinnamon soil is decreased, while that of red soil is increased.

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