

碱性土壤施硫磺对油菜生长、土壤pH和有效磷含量的影响吴曦^{1;2};陈明昌^{1;2};杨治平²

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Effects of sulfur application on the growth of cole, soil pH and available P in alkaline soil

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摘要 通过盆栽试验研究了不同硫磺施用量对碱性土壤pH、速效磷和磷酸酶活性以及油菜生物量、植株体内硝酸盐含量、硝酸还原酶活性和植株吸磷量的影响。研究表明,施用硫磺能显著降低土壤的pH值,增加土壤有效磷含量。与对照相比,施硫磺后土壤pH值最大降幅为0.5个单位。当硫磺用量为120.mg/kg时土壤有效磷含量最高,比对照增加了68.6%。对油菜生长状况的研究表明,施用硫磺能增加油菜植株生物量,降低油菜植株体内硝酸盐含量,提高硝酸还原酶的活性和植株吸磷量。施硫磺与对照相比,油菜植株生物量最大增加了29.64%,植株体内硝酸盐含量降低了58.6%,硝酸还原酶活性提高了近1.8倍,吸磷量增加了1.55倍。研究结果还显示,虽然高硫处理对土壤pH值降低具有明显的作用,但同时也会抑制油菜生长和发育。

关键词: 碱土 硫磺 pH 有效磷 生物量 硝酸盐 油菜 碱土 硫磺 pH 有效磷 生物量 硝酸盐 油菜

Abstract: Pot experiment was conducted to determine the effects of sulfur application on pH, available P content and phosphatase activity of alkaline soil, cole biomass and NO_3^- -N concentration, nitrate reductase activity in plants and P uptake. Results showed that soil pH was remarkably reduced, and an available P content in soil was increased greatly. Comparing to CK, the largest decrease of pH was 0.5. When the amount of the applied sulfur was 120 mg/kg, P content in soil reached the highest value, increased by 68.6% compared with CK. The experiment conducted on the growth status of cole showed that sulfur improved cole biomass, reduced the content of NO_3^- -N, increased the activity of nitrate reductase and P uptake. Compared with CK, the largest biomass increase was 29.64% and the largest decrease of NO_3^- -N was 58.6%. Nitrate reductase activity and P uptake were nearly 1.8 and 1.55 more than those of CK, respectively. When the amount of the applied sulfur was 120 mg/kg, the cole biomass, NO_3^- -N content, nitrate reductase activity and P uptake were all in the optimum range. Meanwhile, high rate of sulfur NO_3^- -N application reduced pH value, but hindered the growth of cole.

Keywords:

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