



平衡施肥及土壤改良剂对连作条件下三七生长与产量的影响

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中文摘要:目的: 探讨三七连作障碍的解决途径。方法: 采用间隔3年的三七连作土进行盆栽试验, 比较大、中、微量元素配合施用和施用甘蔗渣、粉煤灰、糖泥、牛粪、发酵烟灰、沸石、玉米秆等改良剂, 对三七出苗率、存苗率、植株生长和产量影响。结果: 间隔3年的三七连作土中全氮、全磷、全钾、碱解氮、有效磷等成分的含量较新土大幅度增加, 速效钾含量及土壤钾素与氮素养分间比例则是大幅降低, 有效钾和有效磷等微量元素比较缺乏。三七连作土采用“底氮+钙镁磷+高钾+石灰+微肥”的平衡施肥方式可显著改善连作条件下三七的存苗率, 促进三七植株生长, 并显著提高三七植株生物量和总产量。使用甘蔗渣做土壤改良剂也可显著缓解三七连作土的连作障碍效应, 提高连作三七的存苗率, 促进三七植株生长, 增加三七总产量, 但对照相比(不施改良剂), 其存苗率增加31.6%, 三七地下部分总产量增加19.5%。使用粉煤灰做土壤改良剂对缓解三七连作土的连作障碍效应也有一定效果, 其他土壤改良剂效果较差。结论: 连作三七时应采用“调酸(施用石灰)、减氮(低氮)、保磷(钙镁磷)、增钾(高钾)和补充微量元素”的平衡施肥方法, 并增施甘蔗渣作为土壤改良剂。

中文关键词: 三七; 连作障碍; 平衡施肥; 土壤改良剂; 产量

Effects of balanced fertilization and soil amendment on growth and yield of Sanqi in continuous cropping

Abstract: Objective: To explore the solution of continuous cropping obstacle of *Panax notoginseng*. Method: The effects of balanced fertilization and soil amendment on the emergence rate, survival rate, growth and yield of *P. notoginseng* were studied with a pot culture experiment in 3-year-interval continuous cropping soil. Result: The result showed that the content of total N, total P, available N, available P and other available components in continuous cropping soil were higher than those in fresh soil while available K and the rate of K/N were declined, and available Cu and some other micro elements were lack. The way of balanced fertilization "low N + fused calcium-magnesium-phosphate fertilizer + high K + lime + micro elements" would significantly enhance the rate of survival, biomass and yield. It also promoted the growth of *P. notoginseng* in continuous cropping. The bagasse could relieve the continuous cropping obstacle obviously, the survival rate was improved for 31.6% and the yield of medicinal materials was 19.5%. The fly ash had also some effect in relieving the continuous cropping obstacle. Conclusion: The overall results suggested that the adequate fertilization plan is the applying lime, reducing N, applying calcium-magnesium-phosphate fertilizer, improving K and supplying microelement as well as applying bagasse to resolve the problem of continuous cropping obstacle of *P. notoginseng*.

keywords: *Panax notoginseng*; continuous cropping obstacle; balanced fertilization; soil amendment; yield

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