新型微生物菌肥对马铃薯产量的影响

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摘要:为了筛选适合内蒙古马铃薯高产无公害生产的微生物肥施用浓度,采用2因素3水平二次回归正交旋转组合设计,以菌肥浓度和种植密度为自变量,以马铃薯产量为目标函数,建立了数学回归模型,并通过计算机模拟寻优。结果表明:最终筛选出6个产量大于21 750 kg·hm^{-2}的优化方案,其最佳中心值为菌肥浓度9.7×10^{7} cfu·mL^{-1},种植密度55 350株·hm^{-2}。

关键词:菌肥;马铃薯;产量
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内蒙古自治区是全国马铃薯的主产省区,马铃薯种植面积和总产量均排在全国前三位,占全国产量的10%以上,而乌兰察布市是内蒙古以及我国最大的马铃薯产区,马铃薯种植面积和总产量在全国地区级位居第一,占自治区的近1/2,约占全国马铃薯年均种植面积和产量的6%,是我国重要的种薯、商品薯和加工专用基地,被誉为"中国薯都"。2011年在国家工商总局成功注册了乌兰察布马铃薯地理标志证明商标,进一步扩大了"中国薯都"的影响[1]。

马铃薯是粮菜饲兼用的喜凉作物,也是内蒙古的优势农作物之一。2004年马铃薯在内蒙古的种植面积已经达到15万hm^2,比10 a前增加了2倍。由于马铃薯种植面积逐年扩大,再加上人们对环境保护意识的提高,人们不仅追求产量而且对土壤结构的保护意识也提高了,要求尽量不影响土壤结构和不施用含有有害物质的化肥的同时提高马铃薯产量和品质[2]。

微生物肥料是一种简便易行、投资少、见效快、收益大的实用肥料,既能增加马铃薯的产量、

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Effect of Combined Application of Chemical Fertilizer and Straw on Growth and Yield of Soybean

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Abstract: In order to further improve the yield of soybean, the changes of soybean growth and yield were studied under the condition of combining chemical fertilizer and straw. The results showed that the combined application of fertilizer and the straw increased the soybean plant height and chlorophyll content, and promoted the dry matter accumulation of soybean plant. The effect of increasing the amount of straw on the chlorophyll content of soybean plant was little. In seedling stage, straw treatment could promote the formation of soybean nodules, and the late stage gradually show the inhibition effect. The activity of nitrogenase of soybean was promoted by the treatment of low amount of straw, and the activity of nitrogenase was inhibited by high content of straw. The combination of chemical fertilizer and straw could improve the yield of soybean, and the number of pods per plant, grain number per plant, grain weight per plant and yield of low amount of straw were the highest.
Keywords: soybean; chemical fertilizer; straw; nitrogenase activity; yield; chlorophyll content