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宁夏引黄灌区春小麦不同生育期吸收氮、磷、钾养分的特点

何文寿1;何进勤1;郭瑞英2

1.宁夏大学农学院 宁夏银川750021;2.中国农业大学植物营养系 北京100094

Characteristics of N,P and K uptake at different growth stages of spring wheat in irrigating region of Ningxia

HE Wen-shou1;HE Jin-qin1;GUO Rui-ying2*

1 Agricultural College;Ningxia Univ.;Yinchuan 750021;China;2 Department of Plant Nutrition;China Agric.Univ.;Beijing 100094;China

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摘要 选择宁夏引黄灌区中等肥力灌淤土,设置施肥与不施肥处理,在相距约5km的3个试验点进行了肥料田间试验,研究春小麦不同生育期氮、磷、钾养分的吸收特点。结果表明,在供试土壤条件下,施肥可明显提高小麦产量、干物质累积量、体内氮、磷、钾含量及其累积量。施肥或不施肥,小麦地上部干物质的累积量随生育期呈典型“S型”曲线增长,其中拔节期和灌浆期出现两个高峰期,各占总累积量的30%左右。植株氮、磷、钾含量随生育期呈曲线下降趋势,特别是从拔节到灌浆中期下降幅度较大;而在分蘖期以前和灌浆中期以后变化幅度较小。植株氮、磷、钾累积吸收量随生育期的延长和施肥水平的提高而增加,但各生育期相对累积吸收比例,施肥与否差异不大。苗期氮、磷、钾的吸收量约占总吸收量的4%～5%,分蘖期占20%～23%,拔节期分别占30%、41%、34%,抽穗期分别占14%、12%、10%,灌浆期分别占29%、20%、26%,成熟期占1%～3%,其中拔节期是养分吸收的高峰时期。不论施肥与否,地上部氮、磷、钾累积吸收量与其干物质累积量之间均呈极显著正相关,而与植株氮、磷、钾含量之间呈极显著负相关。

关键词: 春小麦 生育期 氮、磷、钾 吸收特点 春小麦 生育期 氮、磷、钾 吸收特点

Abstract: Three field experiments were conducted independently at three places in Ningxia irrigated region by Yellow River water to investigate the characteristics of N,P and K uptake of spring wheat at different growth stages.All the test soil was irrigation-silting soil with middle fertility level.Two fertilization treatments were set up(N 225 kg/ha,P_2O_5 120 kg/ha,K_2O 60 kg/ha and CK)with three replicates for each place.The results showed that application of N,P,K fertilizers remarkably increased grain yields,weights of dry matters,and N,P and K contents and accumulates.Whatever fertilization levels,the above-ground dry matter accumulate increased with the growth stage and showed a typical S-shape.There were two peaks of dry matter accumulation occurred at jointing and filling stages separately and each account for about 30% of total accumulation.The contents of N,P,K in plants showed a downward tendency with growth stages;in which a sharply declined from jointing to middle of filling stage and a slowly declined both in the earlier times of tillering and after middle filling stage were observed.Under all experimental condition,N,P and K accumulation increased with both growth stages and fertilization rates,and the proportion of nutrient accumulate at different growth stages was almost same.On average,N,P,K uptake accounted for 4%—5%,20%—23% of the total uptake at seedling and tillering stages.During jointing period,the absorbed rates accounted for 30%,41%,34%,respectively,which was highest at this stage comparing with the others.The absorbed rates accounted for 14%,12%,10% at heading stage,for 29%、20%、26% at filling stage,for 1%—3% at ripening stage.The uptake rates of N,P,K by plants were significantly positive correlated with the accumulated rates of dry matters,but were significantly negative correlated with the contents of N,P,K in plants either high fertility or low fertility.

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