

夏闲期耕作对旱地小麦土壤水分及植株氮素吸收、运转特性的影响

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Effects of tillage in fallow period on soil water and nitrogen absorption and translocation by wheat plant.

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摘要

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摘要

采用大田试验,研究了夏闲期耕作对旱地小麦播种前和各生育期0~300 cm土壤水分、植株氮素吸收和运转特性的影响.结果表明:夏闲期耕作可提高播种前和各生育期0~300 cm土壤蓄水量,且枯水年效果较好.夏闲期耕作可显著提高各生育期植株氮素积累量、开花期叶片和茎秆+茎鞘氮素积累量、成熟期籽粒氮素积累量,显著提高茎秆+茎鞘氮素运转量及其对籽粒的贡献率、叶片氮素运转量、花前氮素运转量、花后氮素积累量,最终提高氮素吸收效率,以前茬小麦收获后45 d深翻效果较好.夏闲期耕作条件下,土壤水分与花前氮素运转量及籽粒氮素积累量显著相关,且枯水年关系更密切;播种至开花期土壤水分与花后氮素积累量在丰水年显著相关,而枯水年无显著相关关系.夏闲期耕作,尤其是雨后深翻有利于蓄水保墒及植株氮素吸收和转运.

关键词: 旱地小麦 夏闲期 耕作 氮素吸收运转 氮效率

Abstract:

Field test was carried out to study the effect of tillage in fallow period on soil water before sowing and growth stages, and nitrogen (N) absorption, translocation by wheat plant. The current data showed that tillage in fallow period improved the soil water at the depth of 0-300 cm before sowing and growth stages, especially in dry years. Such tillage significantly improved N accumulation in leaf, stem and sheath (SS) at anthesis, grain N accumulation at maturity, N mobilization in SS and the contribution of mobilized N to grain N, amount of mobilized N in leaf, level of N accumulation before anthesis, N transportation from vegetative organs to grains after anthesis, and nitrogen accumulation after anthesis, which in turn enhanced the efficiency of N uptake. Deep tillage at 45 days after harvest had the best effect. Significant correlations were detected between soil water and N accumulation before anthesis as well as N translation from vegetative organs to grains after anthesis, particularly in dry years, while the correlation between soil water from sowing to anthesis and nitrogen accumulation amount after anthesis was significant in wet years, but not in dry years. Tillage in fallow period especially deep tillage after raining could benefit soil water preservation, as well as N absorption and translocation by plant.

Key words: wheat in upland summer fallow period tillage nitrogen absorption and translocation nitrogen efficiency.

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