

渭北旱塬不同田间管理措施下冬小麦产量及水分利用效率

Effects of different field management practices on winter wheat yield and water utilization efficiency in Weibei Loess Plateau

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中文摘要:

水分是限制旱地作物产量最主要的因素,提高自然降水利用效率是增加旱地作物产量的有效途径。2001~2003年在渭北旱塬粉砂壤土上的田间试验研究表明,不同田间管理措施对冬小麦的产量及水分利用效率有显著的影响。秸秆覆盖不仅增加雨水入渗,提高上层土壤含水量,而且促进水分向下运输。在覆盖第二年小麦产量较常规种植显著增加,同时覆盖下土壤有机质含量有较快增加的趋势。夏季休闲期种植填闲作物将不影响下一季作物的水分状况,短期内填闲作物对土壤有机质,小麦产量及水分利用效率也没有影响。

英文摘要:

Water is the main factor influencing crop yield in dryland areas, and the efficient way to increase crop yield is to improve utilization efficiency of precipitation. A two-year field experiment was conducted in Weibei Loess Plateau of Shaanxi Province to evaluate the effects of different field management practices on winter wheat yield and water utilization efficiency from Oct. 2001 to Oct. 2003. The soil is silty loam derived from loess soils. Field management practices in this experiment include full-time mulching with wheat straw, fallow crop planting during summer fallow, conventional practice (summer fallow after winter wheat), and bare soil. The results showed that different field management practices had significant effects on winter wheat yield and water utilization efficiency of winter wheat. First, mulching not only improved rainfall infiltration into soil and soil moisture, but also promoted soil moisture transport during wheat seedling period. Second, the yield of winter wheat was increased significantly compared with conventional treatment in the second year. Another advantage of mulching was demonstrated to increase soil organic matter content. Third, the use of fallow crops ploughed down into soil before sowing wheat did not greatly influence the quantity of water stored in the soil for use of the subsequent wheat crop. Furthermore, fallow crop did not increase soil organic matter content, wheat yield and water utilization efficiency of wheat during experimental years.

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