

甘肃省黄土高原旱地冬小麦—玉米轮作制长期定位施肥的增产效果

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Long-term fertilization on yield increase of winter wheat-maize rotation system in Loess Plateau dryland of Gansu

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摘要 在黄土高原冬小麦—玉米轮作制中通过连续24年的田间试验,研究了旱地长期定位施肥的增产效果。结果表明,各肥料处理的产量大小及其增产趋势是基本一致的,干旱年和正常年为MNP>SNP>NP>M>N>CK;丰水年为NP>MNP>SNP>M>N>CK。干旱年产量降低顺序为N>NP>CK>M>MNP>SNP;丰水年产量增加顺序是N>CK>NP>M>MNP>SNP。降水对化肥尤其是氮肥的增产效果有明显的影响,而有机肥+化肥处理(SNP、MNP)的产量受降水影响较小。在肥料的增产中,化肥(NP)的平均贡献率56.28%,土粪(M)43.72%。在干旱、正常、丰水年型中,化肥的贡献率依次是53.25%、54.00%、59.93%,土粪为46.75%、46.00%、40.07%;NP处理中,N的贡献率依次为19.48%、34.76%、49.61%,而P(P₂O₅)的贡献率为80.82%、65.24%、50.39%,尤其是干旱年份P的贡献率高达88.4%~145.6%;秸秆(SNP处理)在丰水年的增产贡献率为31.42%,与土粪在对应年份的贡献率相差不多,但正常和干旱年增产贡献率达到66.46%和83.63%,较土粪处理的贡献率提高20.46%和36.88%。随着施肥年限的延长,长期施用氮肥增产作用下降,而秸秆还田及有机无机配合则有逐年递增趋势。

关键词: 黄土高原 长期施肥 小麦—玉米轮作 增产效果 黄土高原 长期施肥 小麦—玉米轮作 增产效果

Abstract: A 24-year fertilization experiment was conducted in Loess Plateau dryland of Gansu from 1978 to 2002, to study the yield increase of maize-winter wheat rotation system. The results showed that in the dry, normal and humid year, the crop yield and its increasing tendency of different treatments was coincident, and the sequence was MNP>SNP>NP>M>N>CK in the dry and normal year, and NP>MNP>SNP>M>N>CK in the humid year. the order of yield reduce was N>NP>CK>M>MNP>SNP in the dry year, compared with corresponding treatment in the normal year; and the yield increase was N>CK>NP>M>MNP>SNP in the humid year, compared with corresponding treatment in the dry year. The results also indicated, yield increase with chemical fertilizer treatments, especially N treatment, was affected greatly by rainfall, and the yield of straw combined with N and P treatments (SNP, MNP) were influenced lightly by rainfall. The average contribution rate of NP and M treatments on yield increase accounted for 56.28% and 43.72%, respectively. In the year of dry and normal and humid, contribution of NP treatment on yield increase reached 53.25%, 54.00% and 59.93%, while the M treatment was 46.75% and 46.00% and 40.07%, respectively. The contribution rate of N and P (P₂O₅) on yield reached 19.48%, 34.76%, 49.61% and 80.82%, 65.24%, 50.39% in NP treatment, especially in the dry year the rate of P up to 88.4%~145.6%. However, the yield increase of SN treatment, the contribution rate of straw accounted for 31.42% in the humid year, which has no significant difference compared with MNP treatment, and the rate of straw up to 69.97% in normal year and 83.10% in humid year, which was 20.46% and 36.88% higher than that in MNP treatment. the yield increasing effect with sole N treatment was reducing gradually while the effect of SNP and MNP treatment was going up markedly with the lengthening of experimental years.

Keywords:

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