Effect of row spacing and plant growth regulators on the alfalfa seed yield

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Abstract

The trials were conducted for comparing the seed yield components and seed yield to utilize row spacing and plant growth regulators in the fields of alfalfa cv Zhongmu 2. The results showed that alfalfa seed yield increased with the row spacing from 30cm to 90 cm, but were similar between 90cm and 120cm. As the concentration increased, ethephon and paclobutrazol significantly improved the inflorescences per square metre, and increased seed yield, especially at the highest treatment concentration. For NAA, there were no significantly differences for alfalfa seed yield among different concentration levels.

Introduction

Alfalfa (*Medicago sativa* L.) is a important forage crop in China, especially in the semiarid cropping region of north-western China. In this region the climate is suitable for alfalfa seed production with low humidity and moderate air temperature. Many studies have been conducted on the effects of thinning and between-row spacing on alfalfa seed yield at multiple locations. Recommended between-row spacings in these studies were quite different and varied from 20 to 91 cm (Askarian *et al*., 1995; Zhang *et al*., 2008). Plant growth regulators have opened new prospects for increased seed production in grasses and legumes (Lorenzetti, 1993).

Materials and Methods

Alfalfa (*M. sativa* cv Zhongmu 2) was planted in western Inner Mongolia in April 2008. Different treatments were designed with row spacing (30cm, 60cm, 90cm, 120cm) and plant growth regulators (ethephon, paclobutrazol and naphthicetic acid) in the fields. Ethephon concentration was 0(CK), 0.5, 1.0, 1.5, 2.0 kg/ha; paclobutrazol concentration was 0(CK), 0.2, 0.4, 0.6, 0.8 kg/ha; and naphthicetic acid (NAA) concentration was 0(CK), 0.02, 0.04, 0.06, 0.08 kg/ha. Different plant growth regulators were sprayed on the leaves of alfalfa growing in 60cm raw space during the early flowering and peak flowering. Yield components and seed yield were measured during seed development.

Results and Discussion

With the row spacing enlarged, the inflorences per square metre increased, and there weren't significant difference between 90 and 120 cm row spacing. Ovule number per floret at 90cm spacing was highest, and seed yield increased with the row spacing from 30 to 120 cm, but was similar between 90cm and 120cm. With increased concentration of ethephon and paclobutrazol, the

inflorescece number and seed yield were improved, but there weren't significantly different for floret and ovule number. For NAA, 0.02 and 0.04 kg/ha treatments achieved the higher inflorescence number and seed yield, but there weren't significantly different with CK. It could be suggested that there are different roles on the yield components for ethephon, paclobutrazol and NAA, and understanding the key factors will be helpful for alfalfa seed production in the western China.

References

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