



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

XXI International Grassland Congress / VIII
International Rangeland Congress

Effect of Space Mutagenesis on Different Moisture Content of Alfalfa Seed

Peng Feng
Gansu Agricultural University, China

Yunwei Zhang
China Agricultural University, China

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/14-1/28>

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

Effect of space mutagenesis on different moisture content of alfalfa seed

Feng Peng¹, Zhang Yun-wei^{2*}

¹ Grassland College, Gansu Agricultural University, Lanzhou, 730070, China;

² Grassland Institute, China Agricultural University, Beijing 100094, China.

* Corresponding author. E-mail: zywei@cau.edu.cn

Key words space mutagenesis alfalfa seed moisture content germination growth characteristics

Introduction Space mutation breeding has developed rapidly in recent years, which aims at discovering what happens to germination and sprouting of plant seeds when they are exposed to cosmic radiation and zero gravity. Some seeds may mutate and produce higher yields and improved quality than those untreated seeds. However, the effect of space mutation on the seeds under different moisture contents has received little attention (Ren W.B. *et al.*, 2006).

Materials and methods The experiment was conducted to assess the impact of space mutation on germination rates and growth characteristics of alfalfa seeds carried by the China's first seed-breeding satellite, Shijian-8 on September 9, 2006 under moisture content of 9%, 11%, 13%, 15% and 17%.

Results and discussions Results indicated that space mutation had an evident effect on the different moisture content of alfalfa seeds, partly because of the changes of moisture content of seed altered the seed physiological function, which increase the sensitivity of space mutagenesis. The seed germination rate, the number of branches, leaf area and plant height significantly increased by the space mutagenesis treatments under the water content of 13% and 15%, 17% compared to the untreated control respectively (Table 1). High-moisture content of seed for space carrying are benefit to enhance mutant efficiency. Moisture content of 13% ~ 15% fits alfalfa spaceflight.

Table 1 The space mutagenesis impact on seed germination and plant growth characteristics.

water content		9%	11%	13%	15%	17%
germination rate(%)	CK (untreated)	78.5	81.8 ^a	80.5	75.0	77.5
	SP(space mutation)	79.0	79.0	81.3	78.8 ^a	79.8 ^a
the number of branches	CK(untreated)	12 ^a	11	9	9	10
	SP(space mutation)	10	10	11 ^a	11 ^a	11
leaf area (cm ²)	CK(untreated)	1.40 ^a	0.99	0.75	0.75	0.91
	SP(space mutation)	1.12	0.97	1.55 ^a	1.31 ^a	1.14 ^a
plant height (cm)	CK(untreated)	12.0 ^a	11.9 ^a	8.7	9.0	10.8
	SP(space mutation)	10.3	10.0	12.4 ^a	12.2 ^a	10.4

Note: ^a means between the CK and SP in same water content different significantly at 0.05 level.

Acknowledgement We thank the National Natural Science Foundation of China (30400309) for financial support.

References

- Ren W.B., Han J.G. and Zhang Y.W. 2006. A study of the effect of space mutagenesis on grass seeds. *Grassland science* 23, 72-76.
- Liu J.Y. 2001. Supernatural Space mutation breeding. *Space Exploration* 12: 2-7.