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**Effect of prohexadium-calcium on growth, lodging and yield of proso millet  
(*Panicum miliaceum* L.)**

Young Dae Choi<sup>\*</sup>, Ki Yuol Jung, Hyun Chung Chun, Sang Hun Lee and Hang Won Kang

*National Institute of Crop Science, RDA, Miryang, 50424, Rep. of Korea*

**Abstract**

The proso millet is vulnerable to lodging due to high plant height and shallow root. A lodging results in a hard mechanical harvesting and yield loss. One of solutions on this problem is inhibition of internode elongation. The objective of this study was to set up use time and dose of prohexadium-calcium, is growth inhibitor. The experimental variety was Ibaekchal. The experiment design was a split-plot design with three replications. The treatments were as follow: Main-plots were 25 and 35 day after sowing(DAS) as use time and sub-plots were 0%, 50%, 100%(diluted solution of 1000 times, 1000ℓ ha<sup>-1</sup>), 150% as dose. The amount of nitrogen, phosphate and potassium fertilization were 90, 70, 80 kg ha<sup>-1</sup>, respectively. The size of high ridge and plant spacing were 90 × 30 cm and 60 × 15 cm, respectively. Proso millet was sown on June 9, 2016 by hands and was adjusted at 2 plant per hill. The growth survey of vegetative growth stage was conducted at 1 day before treatment and with one week interval after treatment. Data were collected: (1) grain yield: weight of grain in kg ha<sup>-1</sup>, (2) 1000 grain weight: average weight of 1000 grain, (3) plant height: distance from soil to top of panicle or leaf in cm, (4) ear length: distance from top of stem to top of ear in cm, (5) stem diameter: diameter of second internode (6) degree of lodging: percentage of lodging area, etc. Analyses of variance were performed using R version 3.3.1(<https://www.r-project.org>). The Duncan's multiple range test(DMR) was used to separate treatment means at P < 0.05. There was a significant difference in plant height and number of stem among the use time and dose of prohexadium-calcium during vegetative growth stage. At 25 DAS, the difference with no treatment increased until 25 day after treatment and decreased since then. The difference in number of stem increased until 18 day and decreased since 25 day. At 35 DAS, the difference with no treatment in plant height and number of stem increased until 22 day after treatment and decreased since then. We assumed that the effect of prohexadium-calcium was inhibition of internode elongation and promotion of tillering, continued until 25day after treatment. At 25 DAS, the degree of lodging decreased to 100%, 30%, 10% and 0% as dose increased. At 35 DAS, the degree of lodging decreased to 100%, 20%, 0% and 0% as dose increased. At 25 DAS, the yield was 2910, 2710, 3190, 2310 kg ha<sup>-1</sup> among dose. At 35 DAS, the yield was 2750, 2630, 2220, 2050 kg ha<sup>-1</sup>. We recommend that the optimum use time and dose of prohexadium-calcium for proso millet is 1000 times diluted solution of 1000 ℓ per ha at 25 day after sowing.

Keywords: proso millet, prohexadium-calcium, lodging, optimum use time, dose

Corresponding author\*

Young Dae Choi

Address : 20<sup>th</sup> Jeompiljae-ro Miryang-si, Gyeongsangnam-do, 50424, Rep. of Korea

Tel : +82-55-350-1277, Fax : +82-55-352-3059

E-mail : cyd238@korea.kr