

Author: [ADVANCED](#)

Volume Page

Keyword: [TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1349-1008

PRINT ISSN : 1343-943X

Plant Production Science

Vol. 7 (2004) , No. 1 16-21

[\[PDF \(102K\)\]](#) [\[References\]](#)

Proteins and Carbohydrates in Developing Rice Panicles with Different Numbers of Spikelets

—Cultivar difference and the effect of nitrogen topdressing—

[Yanfeng Ding](#)¹⁾ and [Sachio Maruyama](#)¹⁾

1) National Institute of Crop Science

(Received: March 19, 2003)

Abstract: Proteins and carbohydrates in developing rice panicles were analyzed to see whether these parameters control spikelet number in rice. Two rice cultivars and 2 levels of nitrogen topdressing were used to obtain panicles with different numbers of spikelets. A japonica rice cultivar, Nipponbare, with topdressing (H) had 1.8 times more spikelets per panicle than that without topdressing (L). Moreover, the number of spikelets per panicle in an indica rice cultivar, Takanari, without topdressing was 2.7 times larger than that in Nipponbare-L. Panicles with more spikelets (LP) in Nipponbare-H and Takanari-L showed slower growth than those with few spikelets (SP) in Nipponbare-L in an early stage. LP, however, increased markedly in size thereafter, eventually exceeding SP, in length and fresh weight. Soluble protein content was higher in LP than SP in an early stage, but this difference was hardly detected in a late stage. No clear difference was observed in sugars or starch between LP and SP. Analysis of soluble and insoluble proteins by SDS-polyacrylamide gel electrophoresis showed that bands corresponding to insoluble proteins with a molecular weight about 42 kDa were present at higher intensities in LP than in SP. These results suggest that the spikelet number in rice is controlled by the soluble protein content in an early stage and insoluble proteins with a molecular weight of 42 kDa during panicle development, but not by the carbohydrates in developing panicles.

Keywords: [Carbohydrates](#), [Cultivar difference](#), [Nitrogen](#), [Oryza sativa L.](#), [Panicle](#), [Proteins](#), [Rice](#), [Spikelet number](#)

[\[PDF \(102K\)\]](#) [\[References\]](#)



Download Meta of Article [\[Help\]](#)

[RIS](#)

[BibTeX](#)

To cite this article:

Yanfeng Ding and Sachio Maruyama: "Proteins and Carbohydrates in Developing Rice Panicles with Different Numbers of Spikelets". *Plant Production Science*, Vol. 7, pp.16-21 (2004) .

doi:10.1626/pp.s.7.16

JOI JST.JSTAGE/pp.s/7.16

Copyright (c) 2004 by The Crop Science Society of Japan



[Japan Science and Technology Information Aggregator, Electronic](#)

