

Author: [ADVANCED](#)Volume Page Keyword: 
[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN : 1349-1008

PRINT ISSN : 1343-943X

Plant Production Science

Vol. 9 (2006) , No. 3 200-205

[\[PDF \(498K\)\]](#) [\[References\]](#)

Influence of High Temperature on Morphological Characters, Biomass Allocation, and Yield Components in Snap Bean (*Phaseolus vulgaris* L.)

[Hide Omae^{1\)}](#), [Ashok Kumar^{2\)}](#), [Kouichi Kashiwaba^{1\)}](#) and [Mariko Shono^{1\)}](#)

1) Tropical Agriculture Research Front, Japan International Research Center for Agricultural Sciences

2) Department of Agronomy, CCS Haryana Agricultural University

(Received: August 5, 2005)

Abstract: High temperature in summer is a major limiting factor for the growth of snap bean in the subtropical islands of Okinawa, Japan. The effect of temperature on biomass production, yield components, and morphological characters were studied in five snap-bean cultivars and strains in the phytotron. Plants were initially grown at 24/20°C (day/night temperature, 12/12hr) and transferred to 24/20°C, 27/23°C (control) or 30/26°C at the onset of flowering (34 days after sowing). High temperature (30/26°C) increased single pod weight and the number of flowers and branches, but reduced the number of pods/plant, pod set ratio, and plant weight. ‘Haibushi’ a heat-tolerant cultivar, had higher pod weight/plant, number of pods/plant, pod weight/pod, pod set ratio, number of branches, and rate of biomass allocation to pods, but lower rates of biomass allocation to leaves, stems, and roots than ‘Kentucky Wonder’ a heat-sensitive cultivar, in all temperature regimes. The number of flowers, biomass, and accumulative temperature affected both the yield components (number of pods/plant, single pod weight) antithetically. The yield components were estimated by a stepwise multiple regression analysis. The number of pods/plant was estimated from the number of flowers, leaf weight, pod set ratio per branch, and plant weight with a reasonable precision ($R^2=0.78$). Single pod weight was determined ($R^2=0.69$) from pod set ratio, number of branches, root weight, and accumulative temperature. The results indicated that higher biomass allocation to pods and higher pod set in branches, which were observed in heat-tolerant cultivars at all temperature regimes, were

most effective for the estimation of heat tolerance in snap bean.

Keywords: [Heat-tolerance](#), [Morphological character](#), [Partitioning](#), [Phaseolus vulgaris](#)

[\[PDF \(498K\)\]](#) [\[References\]](#)

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

[RIS](#)

[BibTeX](#)

To cite this article:

Hide Omae, Ashok Kumar, Kouichi Kashiwaba and Mariko Shono: "Influence of High Temperature on Morphological Characters, Biomass Allocation, and Yield Components in Snap Bean (*Phaseolus vulgaris* L.)". Plant Production Science, Vol. **9**, pp.200-205 (2006) .

doi:10.1626/pp.9.200

JOI JST.JSTAGE/pp.9.200

Copyright (c) 2006 by The Crop Science Society of Japan



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

