



Science Links Japan

JST Japan Science and Technology Agency

Japanese journal of crop science

The Crop Science Society of Japan [Info](#) [Link](#)[TOP](#) > [Journal List](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

ONLINE ISSN: 1349-0990

PRINT ISSN: 0011-1848

Japanese journal of crop science

Vol.66 , No.3(1997)pp.402-406

[\[Full-text PDF \(671K\) \]](#) [\[References \]](#)

Relationships among Ethylene Production, Hypocotyl Growth and Emergence in Soybean Seedlings

Shao-Hui ZHENG, Kazuhiro DAN and Jun INOUE

1) Faculty of Agriculture, Kyushu University

2) Faculty of Agriculture, Kyushu University

3) Faculty of Agriculture, Kyushu University

[Published: 1997/09/05]

[Released: 2008/02/14]

Abstract:

Fifty-one soybean [*Glycine max* (L.) Merr.] cultivars having different seed sizes were examined to evaluate the relationships among ethylene production, hypocotyl growth and emergence of seedlings. Endogenous ethylene produced by 3-cm tall etiolated seedlings grown in soil with 13% moisture at 25°C was determined by gas chromatography. After ethylene determination, the same seedling was subjected for measurement of hypocotyl length and diameter. Ethylene production during 48 hours by a seedling ranged from 5 to 84 nL among the cultivars and correlated significantly with seed size, while production varied largely within cultivars with a seed size of about 200 mg. However, when the elongation of a seedling was restricted by a stopper, ethylene production from a seedling was multiplied 1.1 to 12.9-fold as compared to that of an unrestricted seedling. The increase of ethylene production from restricted seedlings was larger in the small seeds in which the seedling ethylene production was lower under the unrestricted condition. High ethylene producing seedlings had thick hypocotyls seemingly to enable the exertion of strong elongation force, while hypocotyl elongation rate was low and the time required for emergence was long. However, in a few cultivars, their seedlings were found to require only a short time for emergence under loose soil conditions though the seedlings produced high ethylene and a thick hypocotyl against elongation restriction. Those cultivars were considered to be superior for emergence under various soil conditions, depending on both the high elongation rate and the thick hypocotyl of the seedling.

Keywords:

Emergence, Ethylene, Hypocotyl growth, Seedlings, Soybean

[\[Full-text PDF \(671K\) \]](#) [\[References \]](#)

