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RESEARCH PAPER

# Periodical dry matter accumulation and partitioning in Indian mustard [*Brassica juncea* (L.)] varieties as affected by limited irrigation and nitrogen levels

**R.K. SAUD* AND B.P. SINGH[1]**

Agricultural Technology Information Centre, Directorate of Extension Education, Assam Agricultural University, JORHAT (ASSAM) INDIA (Email : rksaud@yahoo.com)

***Abstract*** **:** A field experiment was conducted during the *Rabi* season of 1999-2000 and 2000-2001 at Hisar to study the effect of limited irrigation and nitrogen levels on periodical dry matter accumulation and its partitioning in Indian mustard varieties. The variety Laxmi recorded significantly higher dry matter accumulation at all growth stage except at 30 days after sowing. The proportion of dry matter allocation (%) was higher in the variety Laxmi than the variety RH-9304. The dry matter accumulation and its partitioning in different plant parts were clearly distinct under irrigated as compared to unirrigated environment. The proportion of dry matter allocation was higher in one irrigation applied at flowering stage than other irrigation levels. Increasing nitrogen levels, at all growth stage increased dry matter production and higher distinct partitioning values to different plant organs were observed up to 100 kg. $Nha^{-1}$.

***Key Words*** **:** Dry matter accumulation, Dry matter partitioning, Limited irrigation, Nitrogen level, Indian mustard

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## INTRODUCTION

Oilseed crops play an important role in Indian agriculture. Out of five important oilseed crops *viz*., groundnut, rapeseed-mustard, linseed, sesamum and castor grown in the country, rapeseed-mustard occupy a prestigious position and rank second after groundnut. Among the *Rabi* oilseed crops, cultivation of Indian mustard was found more profitable even with limited water along with fertilizer application (Sharma, 1991). Plant genotype, nitrogen use and water-use, these can not be considered in isolation but the interacting effect of fertilizer nitrogen and efficient management of limited irrigation water on different plant genotype of Indian mustard needs thorough consideration and attention to generate more information on growth and phenology of Indian mustard. Keeping above in view, the present investigation was carried out to study the effect of limited irrigation and fertilizer nitrogen on relative performance of Indian mustard varieties with respect to dry matter accumulation and its partitioning in different plant parts.

## MATERIALS AND METHODS

A field experiment was conducted in a split-plot design with three replications during the *Rabi* seasons of 1999-2000 and 2000-2001 at the Agronomy Research Farm of CCS Haryana Agricultural University, Hisar. The soil of the experimental field was sandy loam in texture with 172 and 168 kg/ha available N, 16 and 14 kg/ha available P, 381 and 379 kg/ha available K during 1999-2000 and 2000-2001, respectively. The experiment consisted of two Indian mustard varieties *viz*., $V_1$-RH-9304, $V_2$-Laxmi and three irrigation levels *viz*., $I_0$-no post sowing irrigation$I_1$-one irrigation (60mm) at flowering stage, $I_2$-one irrigation (60 mm) at siliqua development stage as main plot treatments and six nitrogen levels *viz*., $N_0$-no nitrogen application, $N_1$-40 kg N/ha, $N_2$-60 kg N/ha, $N_3$-80 kg N/ha, $N_4$-

*** Author for correspondence.**

[1]Department of Agronomy, C.C.S. Haryana Agricultural University, HISAR (HARYANA) INDIA