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### Response of dill (*Anethum graveolens* L.) cultivars to different date of sowing

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Dill, popularly known as sowa, is one of the oldest cultivated seed spices of India. There are two species of dill under cultivation i.e. European dill (*Anethum graveolens* L.) and another closely related is Indian dill (*Anethum sowa* Roxb). The positive effect of environmental factor on growth and yield could be harnessed if the information on optimum time of sowing is made available with the availability of improved varieties. Therefore, a field experiment was conducted during the Rabi season 2012-13 at the research farm, College of Horticulture, Mandsaur (Madhya Pradesh) to study the response of dill (*Anethum graveolens* L.) cultivars to different date of sowing. There were twelve treatments in the experiment consisted of four date of sowing viz., 5<sup>th</sup> October (D<sub>1</sub>), 20<sup>th</sup> October (D<sub>2</sub>), 4<sup>th</sup> November (D<sub>3</sub>) and 19<sup>th</sup> November (D<sub>4</sub>), and three cultivars viz., NRCSS AD-1 (V<sub>1</sub>), NRCSS AD-2 (V<sub>2</sub>) and local cultivar (V<sub>3</sub>). The experiment was laid out in factorial RBD design with four replications. The date of sowing significantly influenced the growth, yield and quality attributes of different dill cultivars. Maximum plant height at 40, 80 and 120 DAS, number of branches plant<sup>-1</sup> at harvest recorded with sowing on 20<sup>th</sup> October in the cultivar NRCSS AD-1 and days to 50% flowering with sowing on 5<sup>th</sup> October in the cultivar NRCSS AD-1. Minimum days were taken to germination with sowing on 5<sup>th</sup> October in NRCSS AD-2 cultivar. Maximum values were recorded in yield and quality attributes such as fresh weight plant<sup>-1</sup> at 40, 80 and 120 DAS, dry weight plant<sup>-1</sup> at 40, 80 and 120 DAS, number of umbels plant<sup>-1</sup>, number of umbellets umbel<sup>-1</sup>, number of seeds umbel<sup>-1</sup>, test weight, seed yield (q ha<sup>-1</sup>), chlorophyll content in leaves at 60 and 90 DAS (SPAD), with 20<sup>th</sup> October in the cultivar NRCSS AD-1. However, maximum biological yield (q ha<sup>-1</sup>), straw yield (q ha<sup>-1</sup>) and essential oil content of seeds were recorded with sowing date of 5<sup>th</sup> October in the cultivar NRCSS AD-1. Maximum gross return, net return and benefit cost ratio was calculated with sowing date 20<sup>th</sup> October in the cultivar NRCSS AD-1. However, harvest index (%) was non-significant.

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### Carbon sequestration in multipurpose agroforestry plantations: By using monoculture agroforestry models

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A carbon-flow model for managed agroforestry plantations was used to estimate carbon storage in Acharya N G Ranga university campus plantations differing in yield class (growth rate), species characteristics. Time averaged, total carbon storage was generally recorded 19469 kg ha ya<sup>-1</sup> in trees, 2031 kg ha<sup>-1</sup> ya<sup>-1</sup> in soil organic matter and 348424 kg ha<sup>-1</sup> ya<sup>-1</sup> in wood products, the average rate of carbon carbon storage during early stages in most of plantations was in 1209 kg C ha<sup>-1</sup> ya<sup>-1</sup>.

A sensitivity study analysis revealed that average increase in total carbon storage in the tree systems is highest recorded in two tree species viz; *Dalbergia sisso* (1415.11 kg c ha ya<sup>-1</sup>) and *Azadiracta indica* (6372.0 kg c ha<sup>-1</sup> ya<sup>-1</sup>). The carbon storage rate increase of sensitivity per unit area 6-24 m<sup>2</sup> ha<sup>-1</sup> ya<sup>-1</sup> and total carbon storage increase in the range of 2.5 to 4.6 Mg c ha<sup>-1</sup> ya<sup>-1</sup>.

If the main objective is to store carbon rapidly in the short term and achieve high carbon storage in the long term, *Eucalyptus* spp plantations planted in blocks growing on were best (spacing, year rotations) options examined.

If the objective is to achieve high carbon storage in the medium term without regard to the initial rate of storage, then the plantations of any *Dalbergia* species with above 20 years age is suffice. In long term, grown broad leaved plantations of *Tectona grandis* and *Azadiracta indica* store as much carbon compared to other plantations.

#### Biography

R Shankar has completed M.Sc. (Ag.) in Department of Agronomy and under graduation in Agriculture from Acharya N. G. Ranga Agriculture University Hyderabad. His research topic in post graduation is amount of carbon sequestration in multipurpose tree species.

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