Cite this as: Nazim HUSSAIN, Hui LI, Yu-xiao JIANG, Zahra JABEEN, Imran Haider SHAMSI, Essa ALI, Li-xi JIANG, 2014. Response of seed tocopherols in oilseed rape to nitrogen fertilizer sources and application rates. *Journal of Zhejiang University-SCIENCE B (Biomedicine & Biotechnology)*, **15**(2):181-193. [doi:10.1631/jzus.B1300036]

Response of seed tocopherols in oilseed rape to nitrogen fertilizer sources and application rates

氮肥来源与用量对油菜籽生育酚含量的影响

Key words: Oilseed rape (*Brassica napus* L.), Nitrogen rate, Urea, Ammonium nitrate, Tocopherol

关键词：油菜；氮肥施量；尿素；硝酸氨；生育酚

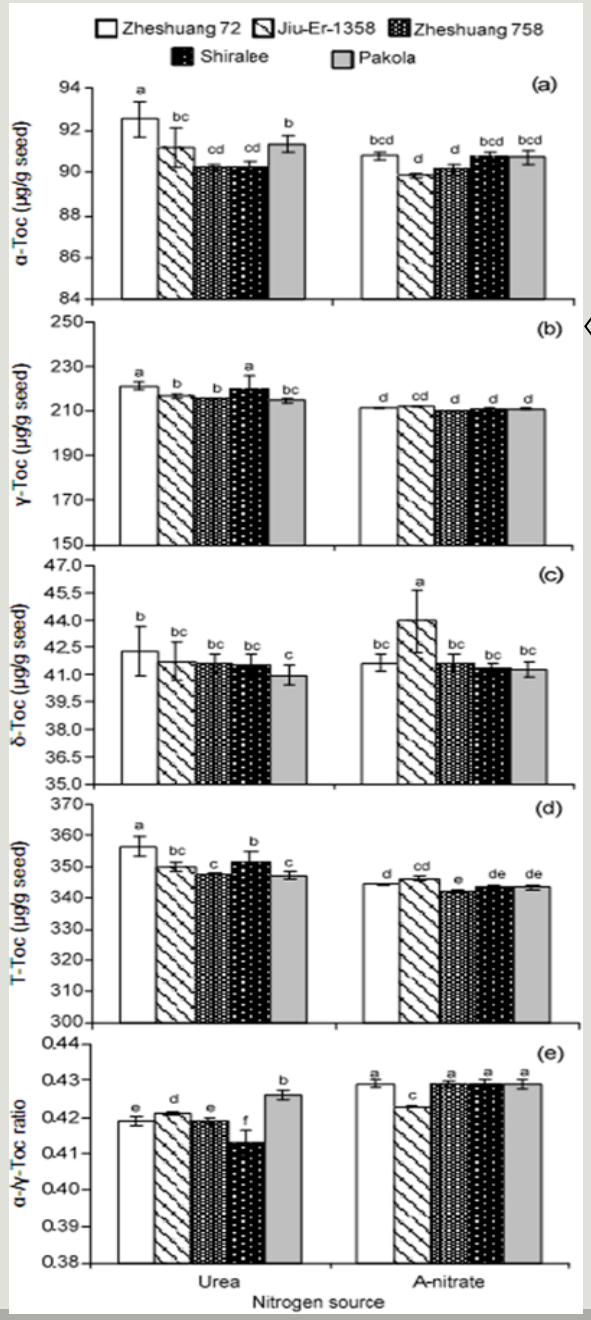
- Tocopherols (Tocs) are vital scavengers of reactive oxygen species and important seed oil quality indicators.
- Nitrogen (N) is one of the most important fertilizers in promoting biomass and grain yield in crop production. However, the effect of different sources and application rates of N on seed Toc contents in oilseed rape is poorly understood.
- In this study, pot trials were conducted to evaluate the effect of two sources of N fertilizer (urea and ammonium nitrate). Each source was applied to five oilseed rape genotypes (Zheshuang 72, Jiu-Er-1358, Zheshuang 758, Shiralee, and Pakola) at three different application rates (0.41 g/pot (N1), 0.81 g/pot (N2), and 1.20 g/pot (N3)).
- Results of the study demonstrated variation in seed Toc contents in oilseed rape based on N sources, N application rates, and genotypes.
- The following points can be drawn from this study:
- Urea, as a source of N, was proven to be more efficient than A-nitrate in terms of higher Toc production per unit seed weight.

- High rates of N should be preferred compared with low rates for oilseed rape because N3 exhibited the highest efficiency by producing more Toc contents per unit seed weight.

- The potential concentrations of several metabolites, such as Toc, in oilseed crops are at a micro level. Therefore, a slight but significant difference because of factors such as N sources and application rates must be given importance and consideration.

- Zheshuang 72 showed the highest genotypic variation in terms of seed Toc. So, large germplasm pools of *B. napus* (including genotypes, breeding lines, and land races) should be evaluated to determine their metabolite profiles and correlative studies to ensure better food and feed quality.

- In addition to Toc and fatty acids, other substances such as phytosterols, carotenoids, retinols,and terpenoids are important metabolites that should be studied comprehensively in *B. napus* to determine seed oil traits that are related to N fertilizer.



Effects of interaction between genotypes and nitrogen sources on the seed tocopherol (Toc) contents of *Brassica napus* L.

Effects of interaction between genotypes and nitrogen sources on the seed tocopherol (Toc) contents of *Brassica napus* L.

