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ON NUTRIENT UPTAKE AND WHEAT CROP**

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## IMPACT OF NPK FERTILIZATION AND WILD MUSTARD (*Brassica napus* L) DENSITIES ON NUTRIENT UPTAKE AND WHEAT CROP

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### ABSTRACT

Managing crop fertilization may be an important component of integrated weed management systems that protects crop yield and reduces the weed population over time. So, two field experiments were conducted at Shandaweel Research Station, Sohag Governorate during two growing winter seasons 2016/2017 and 2017/2018. The aim of this work was to study the effect of NPK fertilizer rates and wild mustard competition on wheat productivity. The experiment was laid out in a split-plot design with four replicates and including eighteen treatments which were the combinations of three NPK fertilizer rates being 50 kg N-10 kg P<sub>2</sub>O<sub>5</sub>-12 kg K<sub>2</sub>O fed-1, 75 kg N-15 kg P<sub>2</sub>O<sub>5</sub>-24 kg K<sub>2</sub>O fed-1 and 100 kg N-20 kg P<sub>2</sub>O<sub>5</sub>-36 kg K<sub>2</sub>O fed-1 and six of wild mustard densities i.e., zero, 5, 10, 15, 20 and 25 plant m<sup>-2</sup>.

Results revealed that increasing NPK rates increased significantly the studied wheat yield and its components in both seasons. Application of N75P15K24 and N100P20K36 fertilizer rates increased grain yield by 6.50 and 19.61 % respectively, in the first season and 3.89 and 11.56 %, respectively in the second season compared to the lowest (N50P10K12) fertilizer rate.

Also, increasing NPK fertilizer rates had a significant effect on N, P and K % of both wheat and wild mustard plants at 30, 60 and 90 days after sowing (DAS). N, P and K % decreased with growth in both wheat and wild mustard plants and were higher with wild mustard than wheat in N and P showing that wild mustard plants are a great competitor with wheat plants for N and P nutrients. Moreover, the addition of NPK fertilizer rates significantly affected N, P and K %, NPK uptake and protein % in wheat grain. Application of N75P15K24 and N100P20K36 augmented protein % in grain wheat by 12.30 and 14.18 %, respectively in the first season and 9.13 and 10.75 %, respectively in the second season compared to the lowest (N50P10K12) fertilizer rate.

On the contrary, increasing wild mustard density m<sup>-2</sup> caused an adverse effect on wheat yield and its components in both seasons. The increasing number of wild mustard plants from 5 to 25 m<sup>-2</sup> reduced the grain yield by 0.05 to 3.61 %, in the first season and by 3.12 to 10.29 %, in the second season compared with wild mustard free treatment.

Positive significant effects were detected for wild mustard density m<sup>-2</sup> on N, P and K percentage of both wheat and wild mustard plants at 30, 60 and

90 days after sowing as well as wheat grain contents of N, P, K and protein in both seasons. Increasing wild mustard plants from 5 to 25 m<sup>-2</sup> decreased grain protein % from 1.11 to 7.91 %, in 2016/17 and from 0.78 to 4.0 %, in 2017/18 compared with wild mustard free plots. From this study, we can conclude that the integration between N100P20K36 fertilization and zero wild mustard plants m<sup>-2</sup> gave the highest wheat grain yield and protein.



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