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FROM SEED TO PASTA

REDUCED NITROGEN FERTILIZATION EFFECTS ON GRAIN CHARACTERISTICS AND END-USE QUALITY IN EIGHT DURUM WHEAT CULTIVARS

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DESCRIPTION RÉSUMÉE

Environmental rules and fertilizer price increase have pushed farmers to reduce nitrogen fertilization on applied to the durum wheat crops. In order to optimize nitrogen application, cultivation practices such as splitting were promoted. These practices are not always sufficient to maintain elevated yield and grain quality required by milling and pasta making processes. The need to create cultivars with better nitrogen use efficiency is essential. Currently, for cultivar registration in the French national list, varieties are not tested under reduced fertilization conditions and it appears difficult to detect those which have the capacity to better use nitrogen. The objective of breeders is now to create new durum wheat cultivars able to grow up with limited nitrogen intake and to remobilize efficiently nitrogen from vegetative organs of the crop to grains during filling with the need to fulfil quality criteria required by pasta making industries. To achieve this goal a study was carried by French breeders associated with public research, development

organizations and industrials in order to define minimal requirements in terms of protein quantity and quality to produce pasta able to satisfy consumers. Eight cultivars were grown during two years in the south of France with nitrogen intakes varying from 0 to 360 units. At harvest, grain characteristics (thousand kernel weight, specific weight, yellow berry...) were recorded and milling value was assessed with a micromill. Protein composition measured by chromatography and content were also evaluated along with gluten index, SDS sedimentation, tenacity. Semolina were produced and used to make pasta on a pilot plant. Pasta quality was appraised by different tests before and after cooking. A statistical analysis was then performed and shown that it is possible to reduce nitrogen fertilization to some extent without affecting dramatically pasta quality. Data also provide information useful to reconsider registration tests.

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- 4 Arvalis Institut du Végétal, France
- 5 Milling, Alpina Savoie, France
- 6 Florimond Desprez, GIE Blé dur, France
- 7 UE DIASCOPE, INRA, France
- 8 RAGT, GIE Blé dur, France
- 9 Quality, PANZANI, France