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Studies on nitrogen rates, sowing dates and cultivars of rapeseed in North-eastern Portugal

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1. Introduction – The rapeseed production in the world has more than doubled in the last twenty years. Total world production increased from 26.7 x 10^6 in 1992 to 62.5 x 10^6 in 2011 [1]. The increase in rapeseed production has been stimulated by the improved quality of the oil for human consumption, but also due to the increased demand for the production of biodiesel. Rapeseed production is widespread in Europe. However, in the Mediterranean basin the crop may experience severe water stress during the spring months, reducing the yield potential of the crop and consequently its profitability. In Portugal the cultivation of rapeseed was not yet adopted by the farmers, although some studies had been carried out to assess the environmental suitability for growing this crop [2,3]. In this work we report results of new experiments where different nitrogen rates, sowing dates and cultivars were tested.

2. Experimental – Two field trials with rapeseed were carried out in Bragança (NE Portugal) in the growing season of October 2011 – July 2012. In one of the experiments, we compared different cultivars and sowing dates. The cvs. used were Hydromel, Williams and Jura. Hydromel was sowed in two dates (October 31th and November 25th, 2011). Cv. Williams was sown in October 31th 2011 and March 5th 2012. Data recorded were plant density, plant phenology dynamic, ground-cover percentage, seed yield and harvested index, N recovered in the seed and in the total biomass. In the second experiment the cv. used was Hydromel. In this experiment we planned to apply several N rates at pre-plant and top-dress. However, the growing season was unusually dry. The accumulated precipitation in December, January, February and March was 47 mm, whereas the average of the region (1971-2000) for those four months is 334 mm. In late February of 2012 the crop seemed to be completely lost. The rosette was really insignificant and the plants had started the stem elongation phase. Thus, we decided do not establish the top-dress N treatments. The final N treatments in this experiment were 0, 25 and 50 kg N ha^{-1}, such as they were established at pre-plant.

3. Results and Discussion – The mean seed yields in the fertilization trial were not statistically different ($P < 0.05$) among the pre-plant N treatments. The values ranged between 949 and 1178 kg ha^{-1}. Jura and Williams cvs. sown early in the autumn produced similar amounts of seed than the cv. Hydromel used in the fertilization trial. The crops of Williams sown in March and Hydromel sown in November were very low, with average seed yields of 212 and 369 kg ha^{-1}, respectively. In previous studies in this region we obtained markedly different rapeseed yields in different years, depending mainly of the precipitation of the winter and spring months [2,3]. In the present study, the unusual low precipitation levels in winter and early spring strongly compromised the possibility of obtaining higher seed yields.

4. Conclusions – The cultivation of rapeseed in NE Portugal seems to present a relatively high risk for farmers. The crop performance is greatly dependent of the precipitation of winter and early spring which in turn presents a high inter-annual variation.

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