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Introduction and efficiency of high starch potato crop in Galicia (Spain)

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Statement of the Problem: Galicia (Northwest of Spain) has an important potato production. Recent years, the market is focused in high starch varieties, which gel forming properties made it perfect for food industry as well as to pharmaceutical, wood and textile. Environmental growing conditions have an important role in starch potato properties, so, there are necessary studies about the efficiency of these cultivars depending of geographical area.

Methodology & Theoretical Orientation: For the present study, seven potato varieties (Allstar, Ardeche, Energie, Kuras, Nofy, Nomade y Signum) were used. All of them were grown in the same location (Ourense, Spain) and were harvested in September 2017 to avoid the climatological and seasonal differences among cultivars. Each variety were planted 30 m^2 with ties of planting and essays were performed in triplicate. Samples were only taken from two lines in the middle of the essay area (1.5mx10m=12 clusters on the plot). The implementation and development of the plant were monitored through a visual evaluation on three different dates, using 5-point scale where 1=poor; and 5=optimal. Gross production (kg/Ha) was estimated with essays data. A PW-2050 Weighing System (Weltech International Limited, UK) was used to determine the dry matter in 3 kg of potato. Statistical differences were evaluated by an analysis of variance (ANOVA) followed by Duncan's test (α>0.05).

Findings: It is appreciated from Figure 1(a) that best production results corresponded to Nomade and Kuras varieties (over 60,000 kg/Ha). All the varieties studied were well adapted to the geographical and growth conditions, showing values above 2.5 in the visual analysis. Genotype and environment conditions affect to the total starch content of potato. Dry matter between 20% is usually in fresh potatoes. However, all analyzed varieties showed values over 22.9%, due to high content of starch.

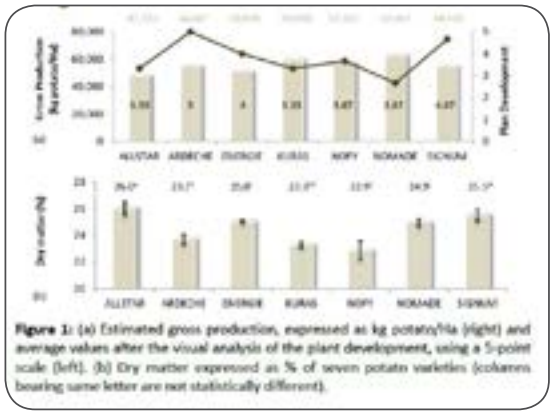

Figure 1: (a) Estimated gross production, expressed as kg potato/Ha (right) and average values after the visual analysis of the plant development, using a 5-point scale (left). (b) Dry matter expressed as % of seven potato varieties (columns bearing same letter are not statistically different).

Recent Publications:

1. Chung HJ, Li XQ, Kalinga D, Lim ST, Yada R, Liu Q (2014) Physicochemical properties of dry matter and isolated starch from potatoes grown in different locations in Canada. Food Research International 57:89–94.

2. Pinhero RG, Waduge RN, Liu Q, Sullivan JA, Tsao R, Bizimungu B, Yada RY (2016) Evaluation of nutritional profiles of starch and dry matter from early potato varieties and its estimated glycemic impact. Food Chemistry 203:356–366.
3. Raatz SK, Idso L, Johnson LK, Jackson MI, Combs GF (2016) Resistant starch analysis of commonly consumed potatoes: Content varies by cooking method and service temperature but not by variety. Food Chemistry 208:297–300.
4. Šimková D, Lachman J, Hamouz K, Vokál B (2013) Effect of cultivar, location and year on total starch, amylose, phosphorus content and starch grain size of high starch potato cultivars for food and industrial processing. Food Chemistry 141(4): 3872–3880.
5. Zaheer K, Akhtar MH (2016) Potato production, usage, and nutrition-a review. Critical Reviews in Food Science and Nutrition 56(5):711–721.

Biography

José Carlos Barrio Carballo is a technician in research and development. He received his B.S. and M.S. in Technic Forestry Engineer at the University of Santiago. He has developed numerous projects, many related to agro-industry and meat companies, and acquired extensive experience in the field of food technology.

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