BREEDING POTATOES FOR ORGANIC FARMING: THE PROMISING 2014' SET OF CLONES

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Organic breeding consists in developing cultivars optimized for completing a successful ecological and economical (re)production cycle in organic farming. Having that in perspective, we started within Embrapa's potato breeding program a specific sub-program for organic farming (traits related to production stability precedes those related to yield; breeding for tuber quality pays off, since the market rewards quality; the market receptivity to innovation allows the use of genetic resources to develop new tuber types). Here, we present the clones selected in 2014. We received true seeds (crosses between *Solanum tuberosum* subsp. *tuberosum* and varieties of *S. tuberosum* subps. *andigena*) from the International Potato Center (Lima, Peru) in 2009; planted them in controlled conditions at Embrapa Vegetables (Brasília, DF) for cloning and, in 2010, for multiplication. Six tubers (15 g) of selected clones (rough selection on tuber type) were stored at cold conditions as seeds for the following season, along with tubers of the reference cultivars Agata, Asterix, and BRS Ana, produced in the same conditions. From 2011 to 2014, clones and cultivars were planted in selection fields (cool and dry season, April-September) at the Unit for Research & Organic Vegetable Production, Embrapa Vegetables (15°56'S, 48°08'W, 1014 m asl). From the first to the last selection year, experimental plots grew from 5 to 40 plants per clone. In all years, we assessed plant vigor and incidence of viruses and foliar diseases (45 days after planting) and, at harvest, tuber appearance. In the last two years (blocks at random, replications), we evaluate also total and commercial yields and specific gravity. In the last year, we add frying quality and tuber internal characteristic. We started with 4,000 seeds (20 families) and ended up with 8 selected clones (0.2%) of 6 families. All selected clones have elongated tubers with shallow eyes. Skins vary from smooth to russet (clone 7866), from shining to opaque (clone 12.531), from yellow (clones 7522, 12.181, and 12.543) to pink (clones 10.010 and 10.015), purple (clone 12.531), and mixed yellow and purple (clone 7442). Pulps range from white (clone 10.015) to bright yellow (clones 7442 and 12.181) with light yellow in between. In 2014, yields were unexpectedly low due to atypical warm nights. Even then, total and commercial yields in selected clones (28.2 and 14.4 t ha^{-1}) were 42 and 118% higher, in average, than in the reference cultivars (19.9 and 6.6 t ha^{-1}). Clones 7866, 12.531, and 12.543 are useful both for the fresh market and processing (specific gravity above 1.069 g cm^{-3}), while the others are indicated for the fresh market. As 2014 was a quite unusual year, we decided to re-evaluate the selected clones once more before heading them to tissue culture, seed production and multilocal trials.

Keywords: organic production; tuber quality, yield, *Solanum tuberosum* subsp. *tuberosum*