TK96.1 - A LATE BLIGHT RESISTANT PROCESSING POTATO VARIETY

Pham Xuan Tung[1], Nguyen Tuyet Hau[1], Pham Thi Lan[1], Tran Xuan Loc[1], Le Thi Thu Hang[1], Phan Minh Man[1], Nguyen The Nhuan[1], Nguyen Van Huan[2], Truong Cong Tuyen[3] and Giang Thi Lan Huong[3]

[1]Potato, Vegetable & Flower Research Center (PVFC)
Institute of Agricultural Sciences for Southern Vietnam (IAS)
[2]PepsiCo International, Vietnam Company (PepsiCo VN)
[3]Field Crops Research Institute (FCRI)

The processing industry needs potato cultivars with special agronomic and quality attributes. High yield of round and uniform tubers with shallow eyes, high dry matter content and attractive flesh color after frying are the major ones. Atlantic has been the main potato cultivar used in production of raw material for chip processing in the country. This cultivar, however, has a major drawback of being one of the most late blight susceptible potato varieties. High vulnerability to late blight (LB) infestation exposes its cultivation to high risks of devastating epidemics and crop losses, especially under tropical highland conditions.

In the potato breeding program at the PVFC, processing potato varieties with high levels of late blight resistance has been a long term target. TK96.1 was selected in 1996 from the cross (TK194.36.14 x 382157.30). Because of the lack of the processing market during the 1990's, it was sent for clean-up and kept in the germplasm collection of the Institute of Horticultural Development at Knoxfield, Victoria, Australia. In 2005, TK96.1 was taken back to PVFC for multiplication for the emerging processing industry.

Results from evaluation during 2007-2010 showed that TK96.1 has a high level of LB resistance under the conditions of the highlands of Dalat. During the rainy season, with appropriate agronomic management, TK96.1 can yield from 18 to 33 tonnes/ha, while during the dry season, yields of up 42 tonnes/ha have been obtained (Table 1 & 2). In the Red River Delta, TK96.1 yield of over 18 tonnes/ha was attained for the Spring off-season 2010 which was significantly higher than yields from other varieties concurrently trialed. Uniform round tubers (slightly flat), shallow eyes, creamy white flesh and high dry matter content of 21-22 % are making TK96.1 the most suitable for chip processing. Fry tests on the processing line of PepsiCo at Binh Duong plant yielded beautiful chip batches with total defects much lower than the allowable limits (Photo 1).

Because of its high yield potential, high level of LB resistance, good processing quality, suitable agronomic characteristics and high yield during the rainy season in the highlands, TK96.1 was recognized and approved for large scale test production by the Scientific Council of Ministry of Agriculture & Rural Development on January 28, 2011. Rapid seed propagation is currently on-going at the PVFC and will soon be available for large scale production.

Table 1**.** Growth, late blight infestation, tuber yield and yield components of 9 potato clones in an observational trial during the rainy season 2007 at Dalat (planted on 5 April, harvested on 15 July).

	Clone	Growth 60 DAP (1-9)	LB infection 60 DAP (1-9)	Number of tubers /plant	Tuber weight /plant (g)	Tuber yield (tonne/ha)	Marketable tubers (%)
1	TK171	9	2	9	405	17.8	75.3
2	TK168	9	2	9	510	22.4	78.4
4	TK 96.1	9	2	9	745	32.7	97.3
5	TK158	9	2	10	455	20.0	73.6
6	TK154	9	2	6	715	31.4	97.9
7	TK 4.2	8	2	3	241	10.6	95.4
8	TK12.4	7	4	2	168	7.4	91.5
9	TK25	7	3	9	695	30.5	97.1

Note LB = late blight; DA= days after planting.
Growth (1-9): 1= very poor growth, unacceptable; 9= very profuse growth.

Table 2. Late blight and leaf miner infestation and tuber yield of 4 potato varieties evaluated during the Winter-Spring (dry) season 2009-2010 at Phuoc Thanh commune, Dalat (planted on 10 December, harvested on 20 March).

	Variety	LB infestation 60 DAP (1-9)	LMF infestation 60 DAP (1-9)	Tuber yield (tonnes/ha)
1	FL1867	1	2	28.27 b
2	TK96.1	1	1	41.30 a
3	Atlantic	2	3	25.77 b
4	PO3	1	1	39.80 a
	CV%	-	-	13,2
	Prob.	-	-	**

Note DAP and LB, see Table 1; LMF= leaf miner flies.

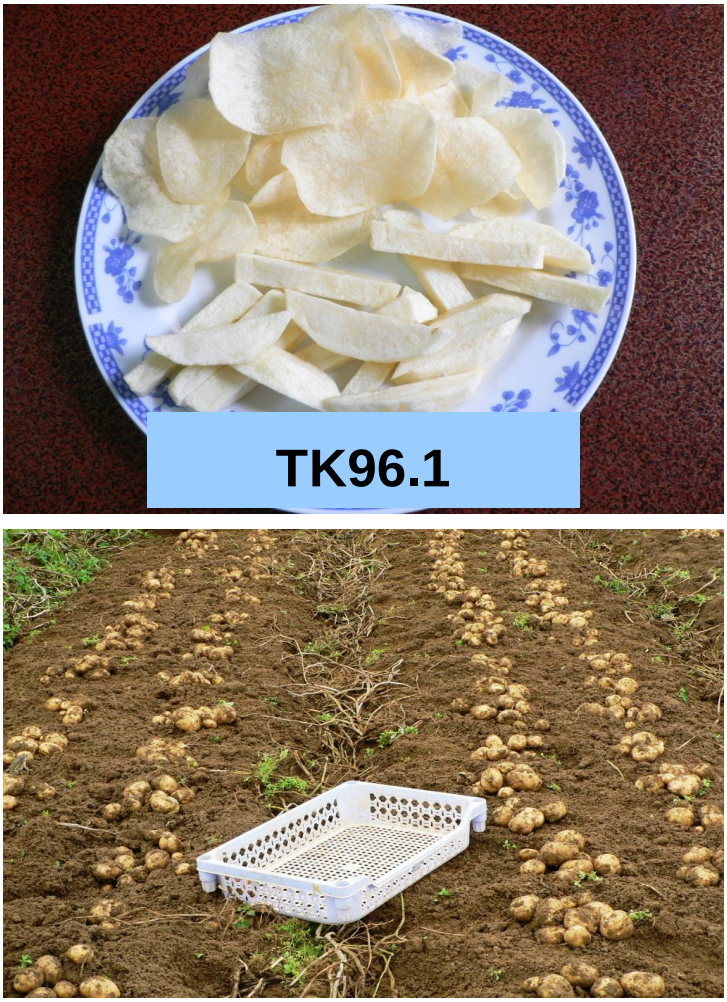

Photo 1. Tuber yield and chips of TK96.1.