

Morphological Variation among Carrots of Different Root Colour Grown in Poland

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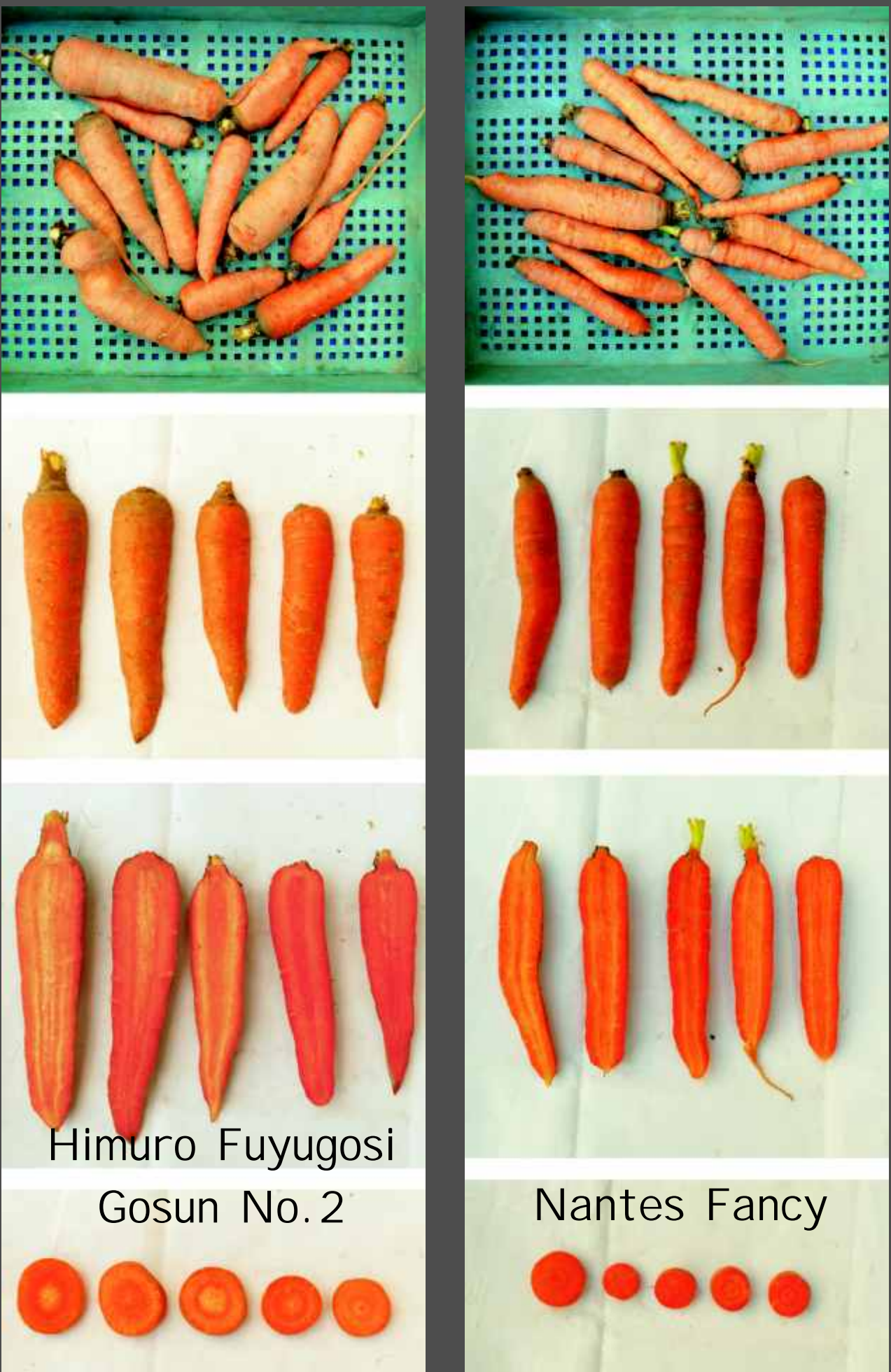
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Carrot (*Daucus carota* L.), a vegetable grown world wide, originated in Central Asia and diversified into distinct forms that spread to west and east. Nowadays, western carrots of orange roots are common in Europe and North America while eastern carrots grown mainly in Asia develop yellow and purple roots. Also white and red carrots are known. Available reports suggest that roots of various colour posses valuable nutritional compounds.



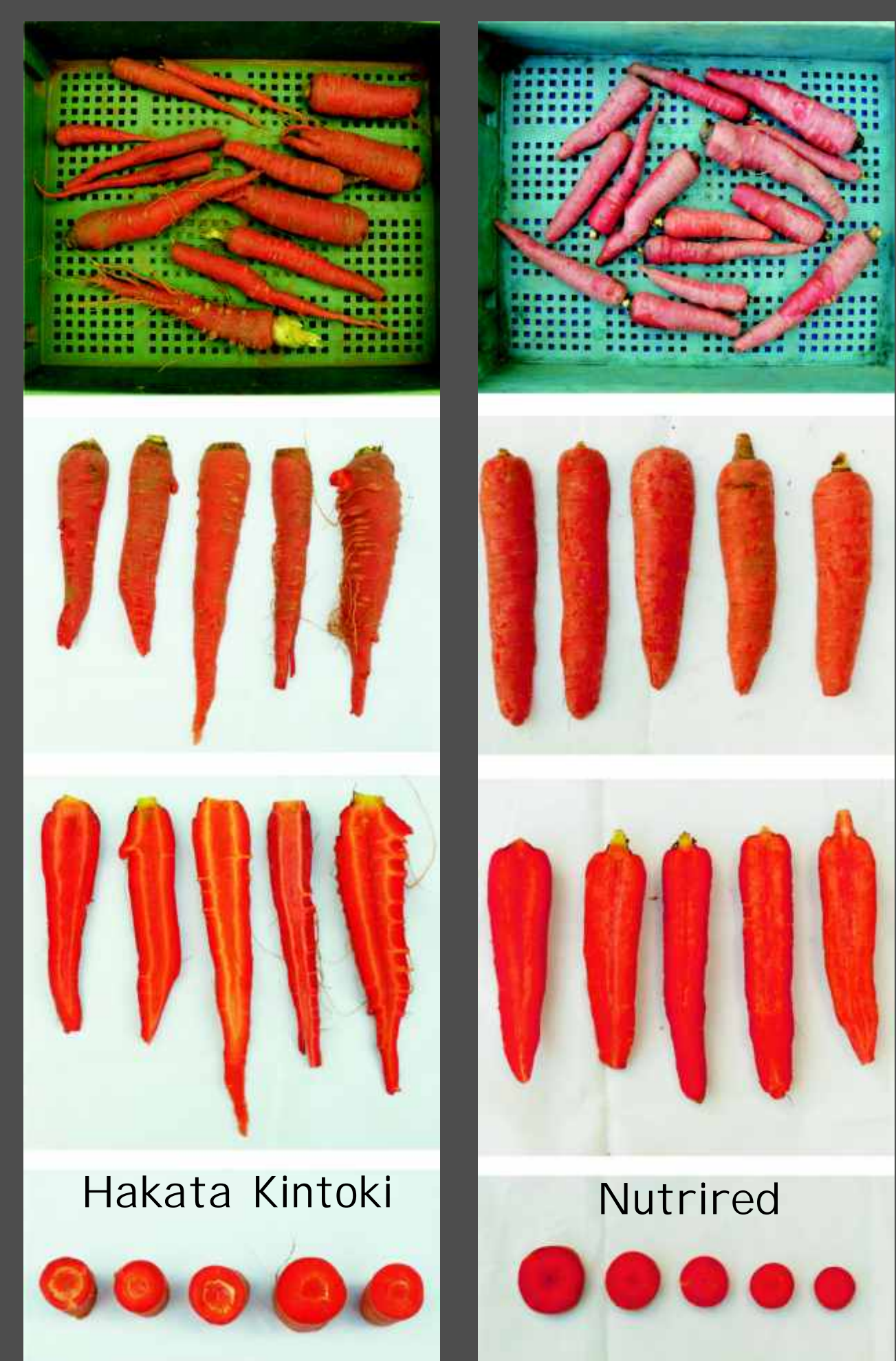
A field trial comprised 25 carrot accessions of diverse root colour originating from various world regions and included elite cultivars as well as local varieties.

The accessions were evaluated with regard to morphological characters according to IPGRI and UPOV descriptors, yield and disease symptoms. Their acceptance by consumers was noted at the 'European Night of Scientists', an event open to public.

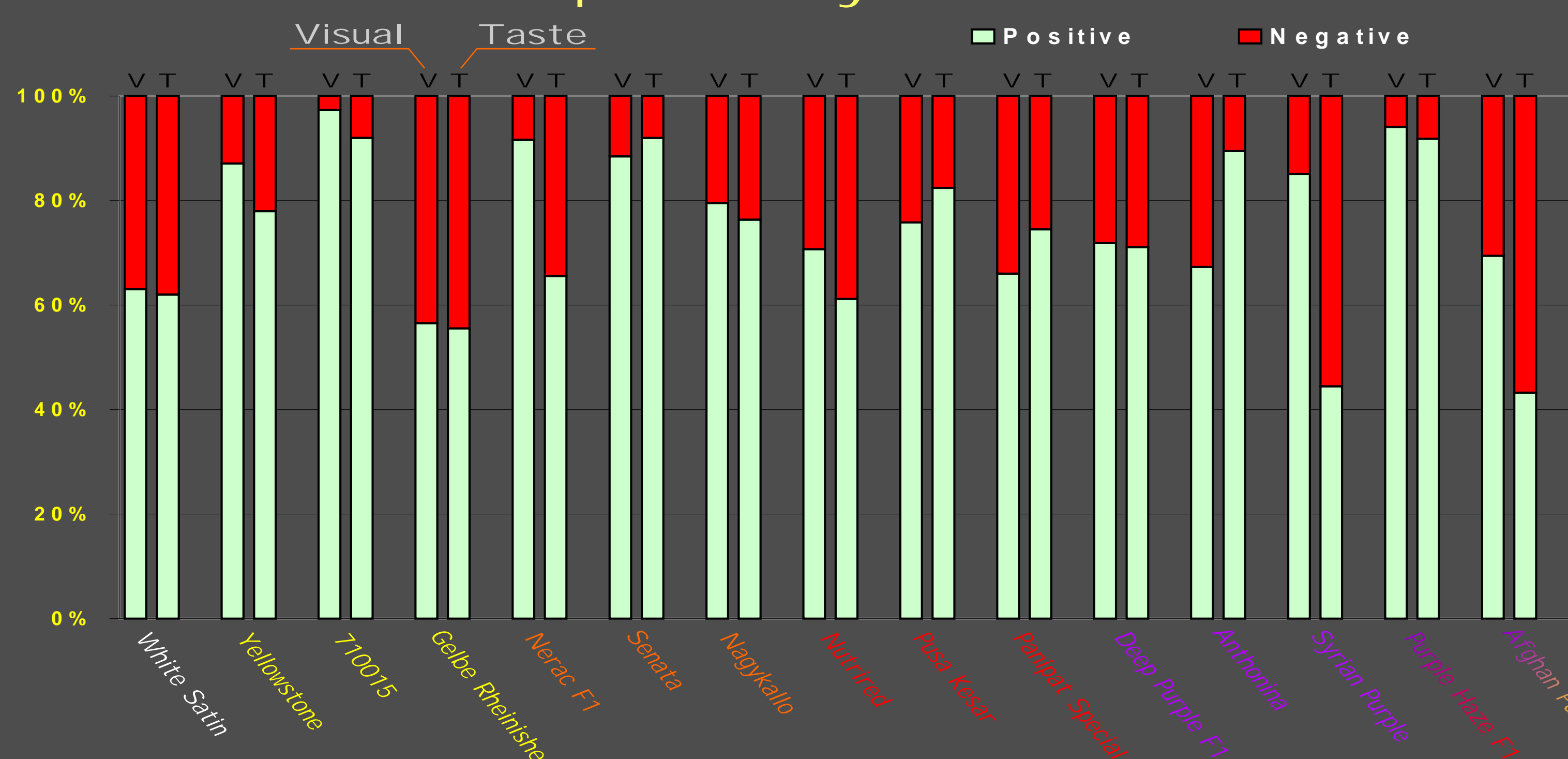
Accession	Origin	Presence of lateral roots	Root surface	Shape uniformity	Head shape	Tip shape	Skin greening	Interior greening	Interior colour uniformity	Leaf stand	Root position in soil	Share of marketable roots	Tolerance to alternaria	Tolerance to root aphids	Morphological Scores			Group mean score	Group rank				
															Sum of '+'	Sum of 'n'	Sum of '-'						
White Satin	NLD	+	+	+	+	n	-	-	n	-	-	+	-	n	5	3	5	1.5	17.5	4.5	3		
Küttiger	SWI	n	n	+	-	-	+	+	-	-	n	+	n	+	6	4	3	5	11				
Blanche	FRA	+	+	+	-	-	+	+	+	n	n	+	n	n	7	4	2	7	9				
Yellowstone	NLD	+	+	n	-	+	+	-	n	+	n	+	+	n	7	4	2	7	9	5.4	2		
710015	USA	+	+	+	+	+	+	-	+	n	n	+	n	n	8	4	1	9	6				
Persia	IRN	n	n	+	+	-	n	-	+	+	n	+	+	n	4	4	2	4	12				
Gelbe Rheinische	DEU	+	n	+	+	+	-	-	n	-	-	+	-	n	5	3	5	1.5	17.5	8.0	1		
Santa Cruz	USA	+	+	+	+	+	+	+	+	+	n	+	+	n	11	2	0	12	1				
Nerac F1	NLD	+	+	+	+	+	+	+	+	n	n	+	n	n	9	4	0	11	2				
Senta	DEU	+	n	+	+	+	+	+	+	n	n	n	n	n	7	6	0	10	5				
Nantes Fancy	DNK	+	n	+	+	+	+	+	+	n	-	+	-	n	8	3	2	7.5	7				
Nagykallo	HUN	n	n	+	+	-	+	+	n	n	n	+	n	n	5	6	1	7	9				
Himuro Fuyugosi	JAP	+	n	n	+	+	+	+	+	n	n	+	+	n	8	5	0	11	2				
Nantejska Polana	POL	+	n	+	+	+	+	+	+	n	n	+	n	n	8	5	0	11	2				
Nutired	USA	+	n	+	-	-	+	+	+	-	-	-	-	n	5	2	6	0	22.5			0.1	6
Hakata Kintoki	JAP	n	n	+	-	-	+	+	+	-	-	-	-	n	4	2	4	1	19				
Pusa Kesar	IND	-	-	+	+	-	+	+	-	n	-	n	-	n	5	2	6	0	22.5				
Panipat Special	IND	-	-	+	+	-	+	+	+	n	n	-	n	-	4	3	6	-0.5	24	1.9	4		
Deep Purple F1	NLD	-	-	+	+	-	+	+	n	-	+	+	-	n	6	2	5	2	15.5				
Anthonina	USA	-	-	+	+	-	+	+	n	-	+	+	-	n	6	2	5	2	15.5				
Syrian Purple	SYR	-	-	+	+	-	+	+	-	-	+	+	-	n	6	1	6	0.5	20.5				
JKI-Selektion	TUR	-	n	+	-	-	+	+	+	n	-	n	-	n	5	2	3	3	13.5				
Purple Haze F1	NLD	n	n	+	-	-	+	+	+	-	+	n	-	n	5	4	4	3	13.5	0.2	5		
LT3-05/01-25	TUR	n	n	+	-	-	+	+	+	n	-	n	-	n	3	3	4	0.5	20.5				
Afghan Purple	USA	-	-	+	-	-	n	n	-	-	+	n	-	n	2	4	7	-3	25				

Impact of a character score on an accession value : + positive, - negative, n neutral

A great variation is observed among the accessions both in morphology of leaves and roots. Evaluation of storage roots reveals that several accessions have different colour of flash and core that make them visually very attractive, particularly when contrasting pigments like yellow lutein and purple anthocyanin accumulate in various tissues. However, negative morphological characters combined with tendency to bolting, low yield or high share of unmarketable roots and unappreciated taste restrict their usefulness for cultivation in Central European conditions. Thus introduction of carrots of various root colour to production requires further breeding efforts.



Acceptance by consumers



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