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QUARTERLY PROGRESS REPORT to
National Peanut Board
North Carolina Peanut Growers Association

TITLE: Evaluation of composition and sensory quality of peanut breeding lines.

LEADER: H.E.. Pattee, Department of Biological and Agricultural Engineering

REPORT: Since the last quarterly report, 47 samples of peanut paste prepared from peanuts harvested in the 2006 crop year were submitted for sensory analysis to the sensory panel in the Department of Food Science at NCSU. These samples represented 12 NCSU breeding lines and three flavor checks (NC 7, Gregory, and Georgia Green), grown in trials at three locations. Variation in sensory profiles for 2007 was not great, and disease-resistant line N03081T, an early maturing line, showed a stronger profile than had been observed in previous years, perhaps suggesting that the yield trials were dug too early for the later lines (including N03090T) to achieve full maturity and optimum flavor (Table 1). Augmenting the multiple-year sensory database with the 2007 data and summarizing for lines of interest showed that a set of lines from the multiple disease resistance breeding program (N03089T, N03090T, and N03091T) were not significantly different from flavor standard Florunner for roasted peanut, sweet, and bitter attribute intensities (Table 2).

Table 1. Mean sensory attribute intensities for 15 breeding lines and cultivars evaluated in the 2006 NCSU Advanced Yield Test at three locations (Peanut Belt Research Station at Lewiston, Upper Coastal Plain Research Station at Rocky Mount, and Border Belt Tobacco Research Station at Whiteville).

Entry	Sensory attribute		
	Roasted peanut	Sweet	Bitter
flavor intensity units (1-14)			
N02005	4.66±0.24 ^{abc}	3.56±0.19 ^{de}	2.23±0.15 ^{ab}
N02009	4.67±0.25 ^{abc}	4.02±0.19 ^{bcd}	2.11±0.15 ^{abc}
N02020J	4.70±0.19 ^{abc}	3.63±0.15 ^{de}	2.19±0.12 ^{ab}
N02064ol	4.31±0.24 ^{bc}	3.64±0.19 ^{cde}	2.50±0.15 ^a
N03005J	4.85±0.24 ^{ab}	3.70±0.19 ^{cde}	2.16±0.15 ^{abc}
N03081T	5.06±0.24 ^a	4.15±0.19 ^{bc}	2.12±0.15 ^{abc}
N03088T	4.56±0.19 ^{abc}	4.23±0.15 ^b	1.83±0.12 ^c
N03089T	4.66±0.21 ^{abc}	4.39±0.16 ^b	2.04±0.14 ^{bc}
N03090T	4.44±0.24 ^{abc}	3.98±0.19 ^{b-e}	2.12±0.15 ^{abc}
N03091T	4.83±0.24 ^{ab}	4.09±0.19 ^{bcd}	2.09±0.15 ^{abc}
N05006	4.12±0.24 ^c	3.59±0.19 ^{de}	2.28±0.15 ^{ab}
N05008	4.52±0.24 ^{abc}	3.61±0.19 ^{de}	2.26±0.16 ^{ab}
NC 7	4.49±0.24 ^{abc}	3.44±0.19 ^e	2.18±0.15 ^{abc}
Gregory	4.55±0.19 ^{abc}	4.05±0.15 ^{bcd}	2.20±0.12 ^{ab}
Georgia Green	4.60±0.21 ^{abc}	4.92±0.16 ^a	1.91±0.14 ^{bc}

a,b,c Means followed by the same letter within a column are not different (P<0.05) by t-test.

Table 2. Adjusted mean sensory attribute intensities for breeding lines and cultivars evaluated in the NCSU yield trials at three locations (Peanut Belt Research Station at Lewiston, Upper Coastal Plain Research Station at Rocky Mount, and Border Belt Tobacco Research Station at Whiteville).

Entry	No. of tests	Years		Sensory attributes						
		No.	First	Last	Roasted peanut	Rank	Sweet	Rank	Bitter	Rank
flavor intensity units (1-14)										
N99103ol (9)	6	2	2004	2005	4.06±0.15 [†]	7	3.23±0.15 [†]	11	3.01±0.13 ^a	10
N00035J	7	2	2004	2005	3.74±0.15 ^z	27	2.80±0.14 ^z	24	3.10±0.12 ^a	6
N00098ol (Gre)	5	2	2003	2004	3.87±0.17 ^{**z}	21	2.87±0.17 ^{**z}	21	3.02±0.14 ^a	9
N01013T	9	3	2003	2005	4.05±0.13 [†]	8	3.13±0.13 [†]	13	2.75±0.11 [†]	19
N01054	5	2	2004	2005	3.45±0.17 ^z	28	2.87±0.17 ^{**z}	22	2.91±0.14 [*]	12
N02005	3	1	2005	2005	3.93±0.21 ^{tz}	14	3.30±0.21 [†]	8	2.73±0.19 ^{tz}	20
N02006	6	2	2003	2005	3.99±0.15 [†]	12	3.07±0.15 ^{tz}	16	2.75±0.13 [†]	18
N02007	5	2	2004	2005	3.89±0.17 ^{**}	19	2.91±0.17 ^{**z}	19	3.20±0.14 ^a	3
N02009	3	1	2005	2005	4.37±0.21 ^{†a}	2	3.11±0.22 ^{tz}	14	3.06±0.19 ^{**a}	7
N02020J	4	1	2005	2005	3.93±0.19 [*]	15	2.89±0.19 ^{**z}	20	3.03±0.16 ^{**a}	8
N03005J	5	2	2004	2005	3.92±0.17 [*]	16	3.14±0.17 ^{tz}	12	2.83±0.14 [†]	17
N03078FT	2	1	2003	2003	3.80±0.26 ^z	26	3.64±0.26 ^{†a}	3	2.68±0.22 ^{tz}	22
N03081T	9	3	2003	2005	4.01±0.13 [*]	10	3.25±0.13 [†]	10	2.85±0.11 [*]	16
N03088T	7	3	2003	2005	4.01±0.14 [†]	11	3.27±0.14 [†]	9	2.62±0.12 ^{tz}	25
N03089T	5	2	2004	2005	4.19±0.17 ^{†a}	5	3.46±0.17 ^{†a}	5	2.68±0.14 ^{tz}	23
N03090T	8	3	2003	2005	4.33±0.13 ^{†a}	3	3.50±0.13 ^{†a}	4	2.52±0.12 ^{tz}	27
N03091T	8	3	2003	2005	4.12±0.14 ^{†a}	6	3.68±0.14 ^{**a}	2	2.66±0.12 ^{tz}	24
N04067JCSmT	2	1	2003	2003	3.97±0.26 ^{†az}	13	2.71±0.26 ^{**z}	27	2.89±0.22 ^{†a}	13
NC 7	64	11	1993	2005	3.82±0.06	24	2.99±0.06 ^z	18	2.99±0.05	11
NC-V 11	4	1	1993	1993	3.83±0.21 ^{**z}	23	2.61±0.21 ^z	28	3.22±0.18 ^a	2
NC 12C	9	3	1993	2004	3.91±0.14 ^{**}	17	2.77±0.13 ^z	25	3.36±0.12 ^a	1
Gregory	12	5	1995	2004	4.04±0.11 [*]	9	3.04±0.11 ^{**z}	17	2.86±0.09 ^{**}	15
Perry	10	3	1995	1997	3.87±0.13 ^z	22	2.84±0.12 ^z	23	3.14±0.11 ^a	5
Phillips	12	4	2001	2004	3.89±0.13 ^{**}	18	3.40±0.13 [†]	6	2.71±0.13 [†]	21
Brantley	18	5	2000	2004	3.82±0.09 ^z	25	3.09±0.09 [*]	15	2.87±0.08 ^{**}	14
VA-C 92R	4	1	1993	1993	3.89±0.21 ^z	20	2.74±0.21 ^{**z}	26	3.16±0.18 ^a	4
Florunner	32	8	1993	2005	4.27±0.08 ^{†a}	4	3.30±0.07 [†]	7	2.61±0.06 [†]	26
Georgia Green	11	2	1998	2000	4.48±0.13 ^{†a}	1	3.86±0.13 ^a	1	2.35±0.11 ^{**z}	28

†, *, ** Denote means not different from that of Florunner by t-test at P<0.10, P<0.05, and P<0.01.

a, z Denote means not different (P<0.05) from the most and least intense in the column by t-test.