



VIRGINIA AGRICULTURAL
EXPERIMENT STATION
VIRGINIA TECH.



‘WALTON’ A HIGH OLEIC VIRGINIA-TYPE PEANUT

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BACKGROUND

- ❖ Breeding history
- ❖ Factors for cultivar acceptance
- ❖ 'Walton' characteristics
- ❖ Advantages and production plan



BREEDING AGREEMENT BETWEEN VIRGINIA
TECH AND UNIVERSITY OF FLORIDA

Collaborative program developed in 2012

- **UF-IFAS makes crosses and testing through F₄**
- **Transfer to VT for advanced testing**
- **Resulting cultivars jointly released**

BREEDING HISTORY OF WALTON (LINE 80X90-3-14-1)

Cross made in 2008 by Barry Tillman

Parentage: 2000x10-1-B2-3-2-2/97x48-HO3-7-B2-2-b3-B

Pedigree selection in F₂, F₃, F₄ in FL

Yield testing began in F₄ in 2012 in FL

Replicated, multi-location testing 2013-2018 in FL and VA

MAJOR FACTORS FOR CULTIVAR ACCEPTANCE IN THE VC REGION

Yield & Grade (TSMK)

Must be competitive with Bailey, Sullivan, Emery, Wynne, Bailey II

Early Maturity (important trait for Virginia)

High Oleic (has become the driver in new cultivars)

Very important for Virginia in-shell market

Seed/Pod Size

Pod size/uniformity is important for in-shell market

Super-ELK % is a factor in small processor's business

Disease Resistance

IMPORTANCE OF HIGH OLEIC TRAIT

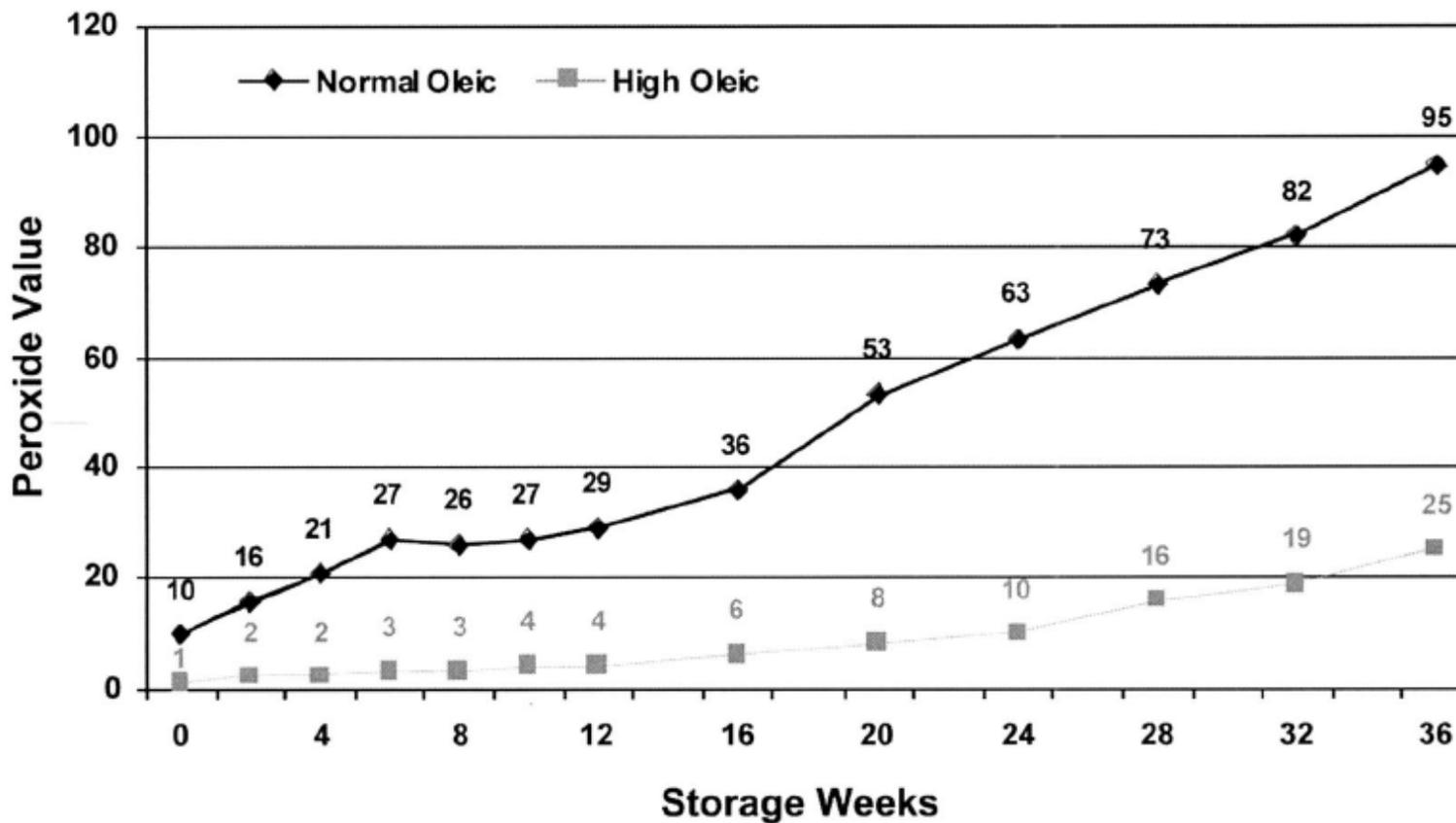


Fig. 1. Shelf life of roasted inshell normal vs. high oleic peanut.

YIELD AND GRADING OF WALTON

Peanut Variety and Quality Evaluation (PVQE): Multi-state (VA, NC, SC), multi-location (5), multi-year (4) (2015-2018)

Variety	Fancy	ELK	SELK	SS	OK	DK	SMK	TSMK	Yield	Value
	%								lb/A	\$/A
Walton	84.5 c	42.9 bc	16.2 a	3.68	2.73	1.33	63.8 a	71.5 a	5334 ab	940 a
Bailey	86.2 bc	40.7 c	8.4 d	4.33	2.63	1.05	63.0 ab	71.0 a	5243 abc	921 ab
Bailey II	87.1 b	46.2 ab	10.9 c	4.35	2.38	1.16	63.7 a	71.6 a	5515 a	978 a
Emery	90.4 a	47.9 a	14.3 ab	3.76	2.09	1.57	63.7 a	71.6 a	5048 bc	893 abc
Sullivan	86.0 bc	39.9 c	10.3 cd	4.58	2.90	1.19	61.0 bc	69.7 b	4876 c	832 bc
Wynne	90.3 a	42.2 c	12.0 bc	4.67	2.57	1.60	60.6 c	69.4 b	4859 c	826 c
Mean	87.4	43.3	12.0	4.23	2.55	1.32	62.7	70.8	5146	898
P>F	0.0001	0.0001	0.0001	0.52	0.010	0.267	0.0010	0.0002	0.0128	0.0072

Fancy, percent pods that do not pass a 34/64 inch spacing set on the pre-sizer.

ELK, Extra Large Kernels, percent kernels that do not pass a 21.5/64 x 1 inch slotted screen.

SELK, Super Extra Large Kernels, percent of kernels that do not pass a 24/64 x 1 inch slotted screen.

WALTON MATURITY

Comparison yield dug at optimum maturity with yield dug two weeks earlier; 2014 & 2015 at five locations in VA

ANOVA –type 3
tests of fixed effects

				Cultivar	Yield (lb/A)			P>t
					Optimum dig	Early dig	Difference	
Effect	df	F-value	P>F	Walton	5173	4882	-291	0.2385
				Bailey	5557	4506	-1050	<0.0001
Cultivar	3	0.17	0.912	Sullivan	5767	4562	-1205	<0.0001
Dig	1	40.07	<0.0001	Wynne	5336	4637	-698	0.0055
C x D	3	2.83	0.0432					

WALTON OLEIC FATTY ACID (C18:1) CONTENT

From multi-year (4) and multi-locations (5) in VA, NC, and SC in PVQE trials

Variety	Year				
	2015	2016	2017	2018	2015-2018
Bailey	48.6	53.5	52.7	54.9	53.6 d
Emery	78.3	80.1	80.6	80.6	79.9 a
Wynne	76.8	78.0	77.7	75.3	77.4 bc
Sullivan	77.9	79.7	80.0	76.6	78.2 ab
Bailey II	74.0	72.9	74.0	81.3	75.6 c
Walton	78.1	80.3	78.5	80.5	79.4 a
Tukey HSD¹	5.9	4.0	6.1	2.1	1.9

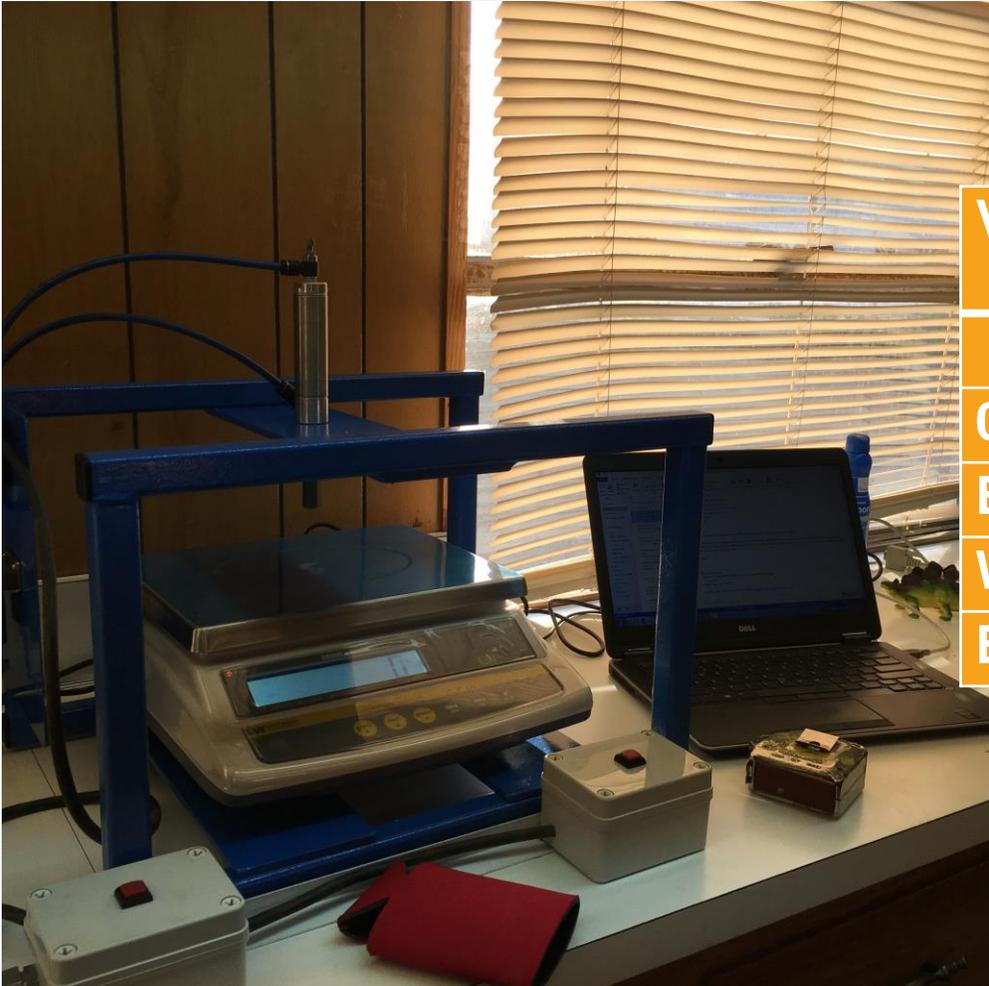
WALTON YIELD UNDER SOIL WATER DEFICIT

From tests under rainout shelters at TAREC in 2015-2017

Genotype	Pod yield (lb/A)				
	Water deficit	Well watered	Average	Difference from Walton	P>t
Walton	4412	7059	5735		
Bailey	3721	5632	4676	-1059	0.043
Emery	3663	5945	4804	-931	0.075
Florida-07	3444	5690	4567	-1168	0.026
GP-NCWS17 (drought tolerant)	4587	5998	5292	-443	0.395
GP-VT NC 01 (drought tolerant)	3769	5924	4846	-889	0.089
N04074FCT (drought sensitive)	1572	4138	2855	-2880	<.0001
Sugg	4193	6195	5194	-541	0.299
Sullivan	3571	5347	4459	-1276	0.015
TUFRunner 297	4337	5841	5089	-647	0.215
Wynne	3428	6003	4715	-1020	0.051

P>F from ANOVA: cultivar <0.0001; water <0.0001; cultivar × water =0.972

HULL STRENGTH OF WALTON



Variety	Jumbo Ridge	Jumbo Side	Fancy Ridge	Fancy Side
	Kilograms force required to break the pods ¹			
08x09-3-14-1	8.4 a ²	7.2 b	7.9 a	9.4 a
Bailey II	8.4 a	9.9 a	8.6 a	7.3 b
Wynne	5.7 b	6.2 bc	5.3 b	6.4 bc
Bailey	4.6 b	5.7 c	4.1 b	5.7 c

ADVANTAGES OF GROWING WALTON

Excellent pod yield and grade

Pod yield comparable with Bailey, Bailey II, and Emery

TSMK is comparable to Bailey, Bailey II, and Emery

Super-ELK is superior to Bailey and Bailey II

Maturity is suitable for Virginia

Yields well in well watered and drought stress

High oleic oil chemistry

Consistent across environments

Hull strength

Holds off pods better than Bailey and Wynne

PRODUCTION PLAN FOR WALTON

- 2019 – FFSP/FAES planted ~ 4 A of breeder seed
- 2020 ~ 10,000 lb of breeder seed available, will be divided between UF, VT, and (hopefully) a farmer field
- 2021 –seed available for commercial production

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South Carolina Peanut Board

