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A New High-Yielding Peanut Variety

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It is the intent of the authors that this bulletin be used by growers, seedsmen, and the peanut industry to describe the attributes of VA-C 92R, a new high-yielding peanut variety. The support of the agencies mentioned above made possible the publishing of this bulletin. Sincere appreciation is expressed for this support.

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VA-C 92R

A New High-Yielding Peanut Variety

VA-C 92R is a new, high-yielding, large-seeded, virginia-type peanut (*Arachis hypogaea* L.) variety released in 1992 jointly by the Virginia Agricultural Experiment Station, the North Carolina Agricultural Research Service, and the Agricultural Research Service, United States Department of Agriculture. It was tested experimentally as VNC 851 in the Virginia-North Carolina Peanut Variety and Quality Evaluation Program (PVQE) from 1986 through 1991.

ORIGIN AND BREEDING HISTORY

VA-C 92R was developed from a cross of the North Carolina breeding line NC Ac. 17213 and the variety NC 7. The pedigree of the breeding line is Florigiant x F393, and the pedigree for NC 7 is Fla 393 x NC 5. The cross was made at North Carolina State University in 1978. The new variety was derived by the pedigree breeding system and originated from a single plant selection made in the F_4 generation in 1980. In the F_7 generation plants appeared uniform and seed testa color was mostly pink, although some plants produced seed with tan testa. Individual plants were selected for plant, pod, and seed uniformity as well as pink testa color on a single plant basis in the F_9 and F_{10} generations by the Coordinator of the Peanut Variety and Quality Evaluation Program. Seeds from these plants were bulked and selfed to produce breeders seed (F_{14} generation).

VARIETAL CHARACTERISTICS

The plants of VA-C 92R have a runner (spreading) to intermediate growth habit. VA-C 92R is not as spreading as the Florigiant variety, but is more spreading than NC 7, one of its parents, which has an intermediate growth habit (Table 1). In some environments, the growth habit of VA-C 92R is variable, as is that of other varieties such as NC 9 and NC-V 11 (Table 2). Plants of VA-C 92R are generally classified as runner (spreading) growth habit since that seems to be the norm (Figure 1).

The lateral branches have alternate pairs of vegetative and reproductive branches similar to those of NC 7. Main stem height and the cotyledonary lateral branch length are shorter than those of NC 7 or Florigiant. The number of lateral branches is similar to that of Florigiant

Table 1. Classification of plant growth habit[1] by test location - 1990

Variety	North Carolina		Virginia	
	Martin Co.	Northampton Co.	Sussex Co.	Suffolk
Florigiant	R	R	R	R
NC 7	I	I	I	I
VA-C 92R	IR	R	I	IR

[1] Plant growth habit classifications: I = intermediate
IR = intermediate runner
R = runner

Table 2. Classification of plant growth habit[1] by test location and year

Variety	Year	North Carolina		Virginia	
		Martin Co.	Northampton Co.	Sussex Co.	Suffolk
NC 7	1990	I	I	I	I
	1991	I	I	I	I
	1992	I	I	I	I
NC 9	1990	I	R	R	IR
	1991	IR	R	R	R
	1992	IR	R	IR	IR
NC-V 11	1990	IR	IR	I	IR
	1991	R	R	R	R
	1992	IR	R	R	R
VA-C 92R	1990	IR	R	I	IR
	1991	R	R	R	R
	1992	IR	R	R	IR

[1] Plant growth habit classifications: I = intermediate
IR = intermediate runner
R = runner

and NC 7 (Table 3). The leaf color is similar to that of NC 7 and is characterized by elongated leaflets (Figure 1) which remain dark green late into the growing season. Individual leaflets are slightly longer and somewhat narrower than those of NC 7. Leaflets of VA-C 92R averaged 2.459 inches (6.25 cm) long and 0.950 inches (2.41 cm) wide compared to 2.325 inches (5.91 cm) in length and 0.961 inches (2.44 cm) in width for NC 7.

Table 3. Main stem height, cotyledonary lateral branch length, and number of cotyledonary lateral branches[1]

Variety	Main Stem Height in.	(cm)	Lateral Branch Length in.	(cm)	Lateral Branch (no.)
Florigiant	10.43	(26.5) a[2]	20.91	(53.1) a	8.08 a
NC 7	10.68	(27.1) a	20.77	(52.8) a	8.23 a
VA-C 92R	9.59	(24.4) b	17.88	(45.4) b	7.94 a

[1] Data are means from 1990 tests located in Northampton County, North Carolina, Sussex County, Virginia, and the City of Suffolk, Virginia. Within each location, data were taken from four plants within each of four replications.

[2] Varieties sharing the same letter are not statistically different (0.05 level) as determined by Duncan's New Multiple Range Test.

Under similar production practices, VA-C 92R maturity is considered to be about the same as that of NC 9 and NC-V 11, 10 days earlier than Florigiant, and approximately 7 days later than VA 81B, our earliest maturing, large-seeded virginia-type variety.

Pods of VA-C 92R are longer and narrower and the seed larger (based on weight), longer, and narrower than those of most of the presently grown varieties (Table 4). Pods are slightly constricted with pronounced veination and an absence of pod pubescence. Two-seeded pods predominate; however, both single-seeded pods and occasionally three-seeded pods are found. Since the pods are long and narrow, the percentage of fancy pods is less than with many available varieties; however, percentage of extra large kernels (ELK) is equal to NC 6 and higher than any other variety except NC 7. Seed are cylindrical with tapered ends, pink in testa color, and smooth in appearance when mature. An occasional seed has a slightly irregular shape with slightly darker pink testa and small reddish blemishes with some white exposed testa tissue appearing as cracks in the outer testa without exposing the cotyledonary surface (Figure 2).

Table 4. Pod and seed characteristics

	Pod		Seed		
	Length[1] (mm)	Width[1] (mm)	Length[2] (mm)	Width[2] (mm)	Weight (g/100)
NC 7	37.1	15.4	18.6	10.7	94.0
NC 9	36.3	14.7	18.2	9.9	84.2
NC-V 11	34.6	13.7	18.3	9.5	78.5
VA-C 92R	38.2	14.5	19.1	9.7	92.4

[1]Average of 20 pods/replication with three replications each from five locations.
[2]Average of 20 seed/replication with three replications each from seven locations.

AGRONOMIC PERFORMANCE

VA-C 92R is a high-yielding, large-seeded, virginia-type peanut variety adapted to the production areas that produce this market type. It has been evaluated for six years (1986-1991) in the Virginia-North Carolina Peanut Variety and Quality Evaluation Program (PVQE) for yield and market grades in small plot tests at four locations throughout the peanut production area with two digging dates at each location.

Six-year averages across all locations show VA-C 92R has superior yield and value at both digging dates when compared to present varieties (Table 5). While it is not considered to be an extremely early maturing variety, its yield and value were higher than those of other current varieties at the first digging date. At the second digging date its yield, value, and grade characteristics increased as did characteristics for all other varieties except yield for NC-V 11. VA-C 92R has fewer loose-shelled kernels (LSK) after harvest than does NC 7 (1.6% compared to 3.0% for NC 7) and about the same as other prominently grown varieties.

Support price ($/cwt) and total kernel percentage were equal to those of NC 7 at both digging dates. Sound mature kernels (SMK) were equal to those of NC 7 at the first digging date and significantly higher at the second digging date. The percentage of extra large kernels (ELK), while not as high as that of NC 7, was superior to all other varieties. Fancy pod percentage was not as high as that of NC 7 or NC 9, but was higher than that of NC-V 11 or NC 10C.

Table 5. Six-year average for yield, value, and market grades across locations, 1986-1991

Variety	% Fancy	% ELK	% SMK	% Total Kernels	Support Price $/cwt	Yield[1] lb/A	Value $/A
				Digging I[3]			
NC 7	89 a[2]	49 a	66.8 ab	72.3 a	$31.74 a	4023 c	$1253 c
NC 9	85 b	32 d	65.9 c	71.6 b	31.16 b	4145 b	1281 c
NC-V 11	72 e	33 c	66.4 bc	72.0 a	31.32 b	4227 b	1314 b
NC 10C	77 d	16 e	65.0 d	70.6 c	30.55 c	3969 c	1211 d
VA-C 92R	78 c	38 b	67.2 a	72.0 a	31.65 a	4335 a	1359 a
				Digging II[4]			
NC 7	88 a[1]	55 a	68.5 b	74.2 a	$32.85 a	4154 b	$1330 bc
NC 9	85 b	39 c	68.3 b	73.6 c	32.37 b	4258 b	1363 b
NC-V 11	69 e	39 c	68.0 bc	73.8 bc	32.09 c	4227 b	1345 bc
NC 10C	76 d	21 d	67.5 c	72.7 d	31.72 d	4171 b	1314 c
VA-C 92R	77 c	45 b	69.3 a	73.9 ab	32.70 a	4506 a	1453 a

[1]All yields are net, adjusted to a standard 7% moisture, and foreign material is deducted.
[2]Duncan's New Multiple Range Test (0.05). Means sharing the same letter(s) are not statistically different. Comparison should be made across varieties within digging date only.
[3]Average date of digging I was the last week of September.
[4]Average date of digging II was two weeks after digging I.

Yield data by locations averaged for the six-year period 1986-1991 (Table 6) show VA-C 92R to have the highest yield at all locations except Suffolk, Virginia. At the Suffolk location, VA-C 92R had a slightly lower yield than that of NC-V 11 for the first digging date, but was equal to that of NC-V 11 at the second digging date. However, VA-C 92R was superior to all other varieties in yield at all other locations.

Table 6. Six-year average yield (lb/A)[1] by location, 1986-1991

Variety	North Carolina		Virginia	
	Martin Co.	Northampton Co.	Sussex Co.	Suffolk
	Digging I[3]			
NC 7	3846b[2]	3966b	4459ab	3820c
NC 9	4178a	4104b	4329bc	3970b
NC-V 11	4146a	3993b	4526a	4242a
NC 10C	3855b	4081b	4229c	3711c
VA-C 92R	4281a	4489a	4596a	3975b
	Digging II[4]			
NC 7	4335b	3889b	4361b	4031b
NC 9	4507b	4096ab	4390b	4039b
NC-V 11	4350b	3994ab	4300b	4265a
NC 10C	4292b	4189a	4314b	3888b
VA-C 92R	4885a	4284a	4624a	4231a

[1]All yields are net, adjusted to a standard 7% moisture, and foreign material is deducted.
[2]Duncan's New Multiple Range Test (0.05). Means sharing the same letter(s) are not statistically different. Comparison should be made across varieties within a location and digging date only.
[3]Average date of digging I was the last week of September.
[4]Average date of digging II was two weeks after digging I.

Yield increased at the second digging date compared to the first digging date at all locations except Northampton County, North Carolina, where VA-C 92R's yield was slightly lower at the second digging date, as was that of both NC 7 and NC 9. While maturity of VA-C 92R is similar to that of NC 7 and NC 9, yields at the second digging date continued to increase, except at the Northampton County site where NC 7 and NC 9 also declined.

DISEASE ASSESSMENT

During its extensive testing throughout the Virginia-Carolina peanut production area, VA-C 92R was exposed to various peanut diseases. When diseases were present in a test, an effort was made to assess the susceptibility of VA-C 92R to various diseases in relation to other varieties that are presently being grown.

Early Leafspot

Ratings for early leafspot, caused by *Cercospora arachidicola* Hori, were taken at several locations during 1989 through 1992 (Table 7). These data reflect that, with a recommended control spray program, VA-C 92R is equal to NC 9 in disease susceptibility while NC 7 is rated slightly less susceptible. However, in tests where recommended fungicides were not used (unsprayed), it appears that VA-C 92R is more susceptible than NC 9. Therefore, growers using a recommended control program should be able to control this disease as effectively as they do for other varieties.

Table 7. Leafspot ratings[1] from sprayed and unsprayed tests, 1989-1992

Variety	Sprayed[2]	Unsprayed[3]
NC 7	2.6	-
NC 9	3.2	5.1
VA-C 92R	3.2	6.3

[1]Ratings are based on a scale of 1-10 with 1 = 0% defoliation and 10 = 100% defoliation.
[2]Average of eight tests (1989-1992) with three replications each.
[3]Average of four tests (1989-1992) with four replications each.

Black Root Rot

Cylindrocladium black rot (CBR), caused by *Cylindrocladium crotalariae* (Loos) Bell and Sobers, is a devastating disease on some peanut farms. Chemical fumigation has assisted in the control of this disease, but in the years when the disease has been severe soil fumigants have not been totally effective. Under CBR disease pressure, VA-C 92R has had a higher rating than that of the resistant variety NC 10C; its rating is also higher than

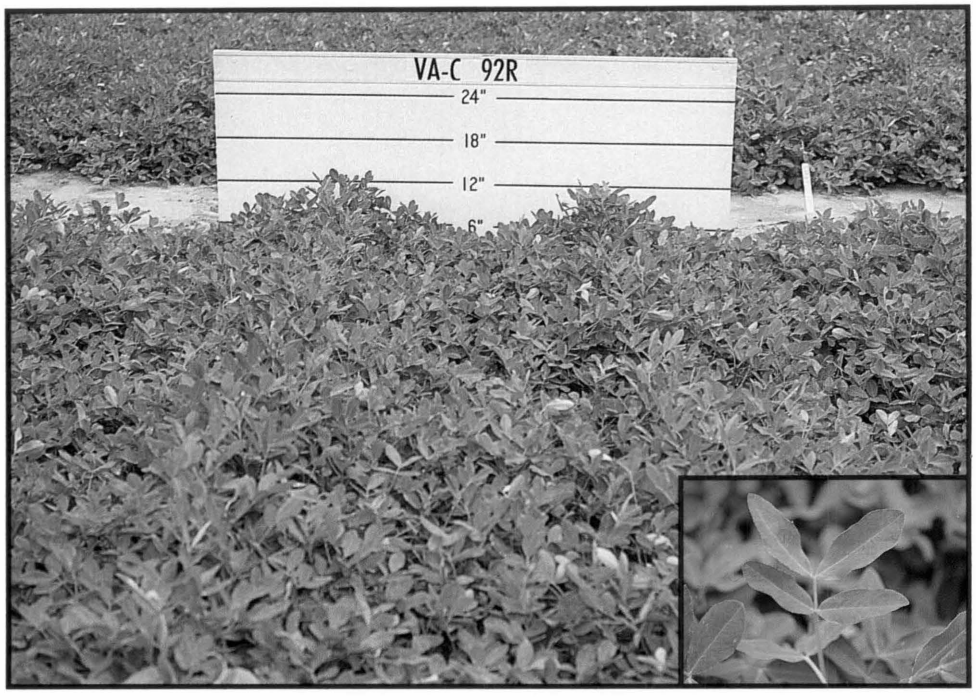


Figure 1. Plants of VA-C 92R showing the runner growth habit and leaflet characteristics.

Figure 2. Pods and seeds of VA-C 92R showing the various characteristics described in the text.

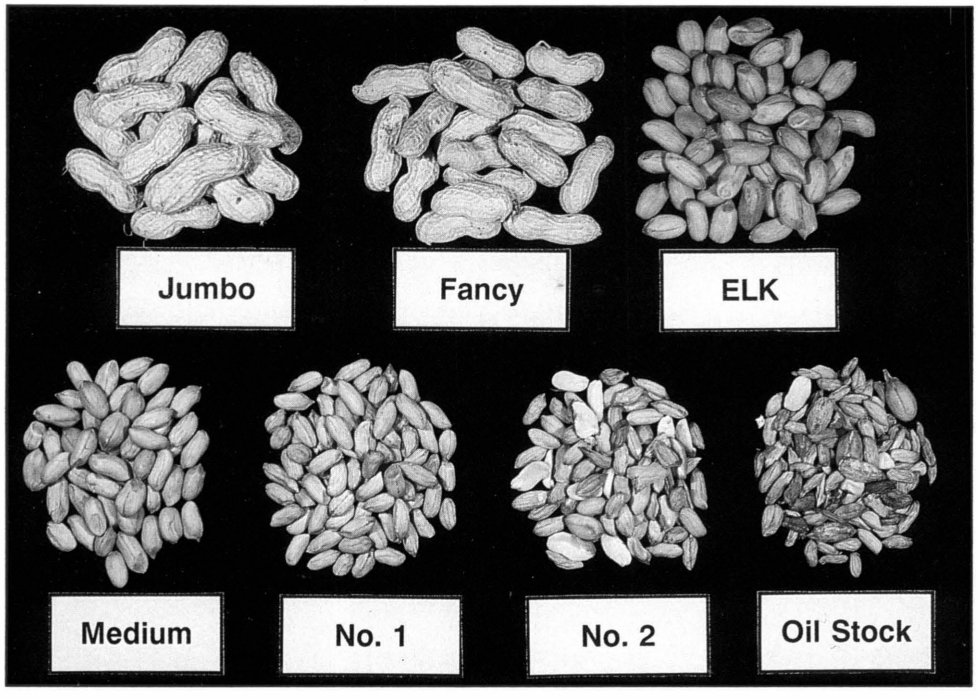


Figure 3. Samples of all market grades of VA-C 92R.

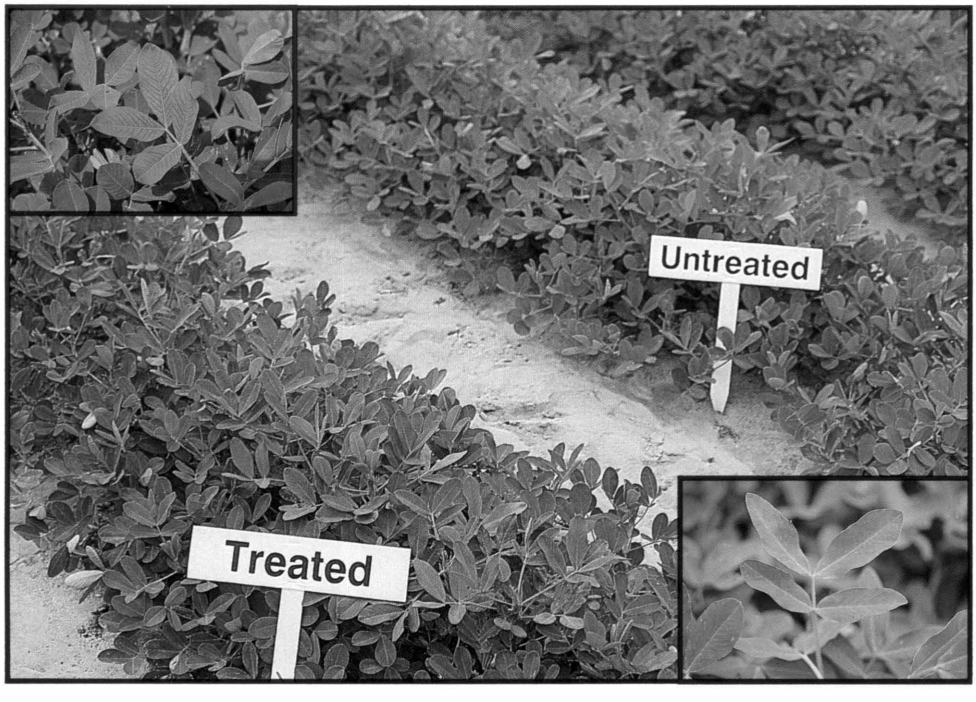


Figure 4. Plants of VA-C 92R showing symptoms of manganese deficiency (untreated) (upper left inset) and normal growth (treated) (lower right inset).

the rating of NC 9, which is more resistant than NC 7. VA-C 92R appears to have a disease rating similar to those of NC 7 and NC-V 11 (Table 8).

Table 8. Cylindrocladium black rot incidence (number of feet infected/80 feet of row)[1] - 1989 and 1992[2]

	1989	1992		
	Martin Co.	Martin Co.	Suffolk	Mean
NC 7	28.5	9.4	20.4	19.4
NC 9	18.0	7.0	15.2	13.4
NC-V 11	31.0	22.2	17.2	23.5
NC 10C	11.0	6.0	5.9	7.6
VA-C 92R	14.0	17.8	19.8	17.2

[1]Any evidence of disease, ranging from a single infection site to death of the plant in a foot of row, was counted.
[2]Data are averages of six replications for each location taken from the PVQE tests.

Sclerotinia Blight

Sclerotinia blight, caused by *Sclerotinia minor* Jagger, is a disease causing tremendous dollar loss, particularly in Virginia. None of the popular varieties grown on significant acreage today have resistance to this disease. Data collected from tests in 1988 through 1992 where this disease was a severe problem are given in Table 9. These data indicate that NC 7, NC 9, and NC 10C are highly susceptible to this soil-borne disease. NC-V 11 and VA-C 92R, while not resistant to sclerotinia blight, do appear to be slightly less susceptible than other varieties evaluated in these tests.

In nine disease and maturity tests conducted from 1989-1992, in which VA-C 92R and NC 7 were the only released varieties common to all tests, VA-C 92R was less susceptible to sclerotinia blight than was NC 7 (ranging from 8.5% to 12.2% less disease). The lower rating could be a result of less vine growth, which allows for better air circulation and drier conditions which are less likely to favor disease proliferation. Data collected over several years and various tests suggest that sclerotinia blight should be less severe with VA-C 92R than with some varieties.

Table 9. Sclerotinia blight ratings (number of hits/80 feet of row)

Variety	PVQE Tests[1]	Disease and Maturity Tests[2]
NC 7	27.2	48.0
NC 9	30.8	-
NC-V 11	21.9	-
NC 10C	34.1	-
VA-C 92R	17.5	41.2

[1]Average of three PVQE tests in Suffolk in 1988, 1991 and 1992, with three replications per test.
[2]Average of nine disease and maturity tests with four replications each conducted in Suffolk from 1989 through 1992.

Stem Rot and Pod Rot Complex

Stem rot, caused by *Sclerotium rolfsii* Sacc., usually causes minor damage to peanuts in some years at some locations. Data were obtained in 1987 and 1991 at test sites where above-ground symptoms of stem rot were evident. These data (Table 10) indicate that VA-C 92R, NC 7, and NC-V 11 are similar in susceptibility, with slightly higher disease ratings for VA-C 92R than for NC 9 or NC 10C. However, it should be emphasized that the disease pressure was quite low in these tests.

Table 10. Incidence of southern stem rot and/or pod rot complex (number of feet infected/80 feet of row)

Variety	Before Digging: Above-ground Symptoms[1]	After Digging and Inverting Below-ground Symptoms[2]
NC 7	3.2	7.6
NC 9	2.0	6.6
NC-V 11	2.6	16.9
NC 10C	1.1	5.4
VA-C 92R	3.5	9.3

[1]Average of seven PVQE tests (1987 and 1991) with three replications per test.
[2]Average of 13 PVQE tests (1990-1992) with three replications per test. Below-ground symptoms included stem rot and/or pod rot.

Below-ground symptoms of stem rot and/or pod rot complex were evident after peanut plants were dug and inverted at some test sites. These data, collected in 1990 through 1992 (Table 10), indicate that VA-C 92R is similar to NC 7, NC 9, and NC 10C in susceptibility.

A summary of VA-C 92R's reaction to major peanut diseases can be made based on data collected at test sites where these diseases occurred in sufficient amounts to cause yield losses. Leafspot susceptibility is slightly worse than NC 7's, but not different from NC 9's. CBR is more severe than with the resistant variety, NC 10C. Susceptibility to Sclerotinia blight appears to be less than with NC 7, NC 9, and NC 10C. Stem rot above-ground symptoms are similar to NC 7's and slightly worse than NC 9's and NC 10C's. Below-ground symptoms of stem rot and/or pod rot complex show VA-C 92R to be slightly worse than NC 10C, NC 7, or NC 9, but not as susceptible as NC-V 11.

QUALITY EVALUATIONS

VA-C 92R has been evaluated extensively for quality throughout its testing. In 1988 it was grown in one-half acre increase plots in Martin County, North Carolina, and the City of Suffolk, Virginia, so as to produce sufficient quantity for evaluations of milling and processing quality. Florigiant, a variety planted on large acreage at that time and considered to have excellent processing quality, was also grown for comparison.

Mill Outturn

Milling data (Table 11) indicate that VA-C 92R has a higher percentage of ELK and total outturn and a lower percentage of mediums and No. 1's than Florigiant when straight shelled. Removing the jumbo and fancy pods for in-shell use shows VA-C 92R to have a higher percentage of jumbo pods, ELK, and total outturn, and a lower percentage of No. 1's and No. 2's, than Florigiant. A photo of all market grades of VA-C 92R is shown (Figure 3).

Table 11. Evaluation of VA-C 92R and Florigiant for mill outturn from peanuts grown in the 1988 PVQE increase plot tests

Character	Straight Shelling[1]		Jumbo and Fancy Removed[2]	
	VA-C 92R	Florigiant	VA-C 92R	Florigiant
% ELK	28.9	17.4	11.3	7.9
% Mediums	23.8	31.5	17.3	18.4
% No. 1	6.3	9.2	5.7	7.2
% No. 2	6.6	6.8	5.7	6.8
% Oilstock	1.5	1.8	1.5	1.7
% Pickouts	0.8	0.6	0.9	0.5
% LSK	0.8	0.4	1.4	0.8
% Total outturn	68.7	68.1	79.6	76.6
% FM	2.1	2.4	2.1	2.7
% Hulls	29.2	29.5	18.4	20.7
% Jumbo	-	-	4.6	2.0
% Fancy	-	-	31.1	31.4

[1]Straight shelling is shelling of farmer stock peanuts without removing jumbo and fancy pod sizes.
[2]Jumbo and fancy in-shell grades were removed and the remainder of farmer stock peanuts shelled.

Grade Characteristics

Characteristics of the various market grades (Table 12) show VA-C 92R to have larger sized seed (based on count/lb) and a slight tendency to produce more splits upon shelling. In-shell grades shows the count/lb for jumbo and fancy are lower for VA-C 92R than for Florigiant for both jumbo (152 versus 165) and fancy (193 versus 209), indicating that the pods of these in-shell grades are heavier for VA-C 92R than for Florigiant.

Seed Size Distribution

Based on farmer stock peanuts, VA-C 92R has a higher percentage of its seed in the larger screen sizes than does Florigiant when the seed size distribution is compared by individual screen size (Table 13). Therefore, VA-C 92R should provide more peanuts for the ELK market grade size that is in demand by today's processors.

Table 12. Grade Characteristics of ELK, Medium, No. 1, and No. 2 grades for VA-C 92R and Florigiant in the 1988 PVQE increase plot tests for straight shelling and with the jumbo and fancy pods removed

	Count/lb		% Splits		% Damaged		% Fall Through[1]	
Grade/Variety	Straight[2] Shelling	Jumbo and Fancy Removed	Straight Shelling	Jumbo and Fancy Removed	Straight Shelling	Jumbo and Fancy Removed	Straight Shelling	Jumbo and Fancy Removed
ELK								
VA-C 92R	481	512	3.5	2.5	0.0	0.0	0.0	1.2
Florigiant	513	546	2.0	4.5	0.0	0.0	0.2	0.2
Mediums								
VA-C 92R	619	650	1.5	2.2	0.5	0.8	5.2	4.8
Florigiant	626	642	1.5	2.8	0.0	0.2	6.8	6.5
No. 1								
VA-C 92R	1049	1032	29.8	24.8	0.2	0.8	2.8	1.2
Florigiant	1018	1040	14.5	10.2	0.0	0.2	3.5	2.5
No. 2								
VA-C 92R	--	--	78.0	92.5	2.2	2.8	7.2	3.0
Florigiant	--	--	74.0	79.5	2.5	1.8	10.5	7.0

[1]Screens used to get % fall through were: ELK - 20/64 x 1" slot; Medium - 18/64 x 1" slot; No. 1 - 15/64 x 1" slot; and No. 2 - 17/64 round hole.
[2]Straight shelling is shelling of farmer stock peanuts without removing Jumbo and Fancy pod sizes.

Table 13. Seed size distribution for VA-C 92R and Florigiant based on farmer stock peanuts from the 1988 PVQE increase plot tests

Screen Size[1]	VA-C 92R	Florigiant
	----------%----------	
<18R	2.26	2.82
18R	4.39	3.17
14	1.59	2.21
15	1.03	2.14
16	1.86	3.04
17	2.93	4.35
18	4.92	6.89
19	7.16	8.42
20	9.07	10.66
21	12.80	13.26
22	13.56	8.71
23	5.49	2.61
24	2.35	0.82
25	1.82	0.44
26	1.07	0.14
27	0.28	0.03
28>	0.16	0.02
<15	8.24	8.20
15-17	5.82	9.52
18-20	21.16	25.97
21>	37.53	26.01
SMK	64.51	61.50
Total Kernels	72.75	69.70

[1]Screen sizes are all 64th inch; the R represents round hole screens, and all others are one-inch slotted screens.

Blanchability

For peanuts that are shelled and used in the salting trade, blanchability is an important trait since processors need to remove the seedcoat with ease yet not split the kernel. Samples from two PVQE tests (Martin County, North Carolina and Suffolk, Virginia) were evaluated for blanchability in 1988 through 1991 in a small laboratory blancher for extra large (Table 14) and medium (Table 15) grades. VA-C 92R was equal to NC 9, superior to NC 7, but not as good as NC-V 11. These results were expected since NC-V 11 has an easily removed testa. Thus, blanchability of VA-C 92R is an improvement over its parent NC 7 in that it has more whole blanched kernels and fewer not blanched and partially blanched kernels.

Table 14. Blanchability of extra large kernels - average of two PVQE tests, 1988-1991

		Blanched		
Variety	% Splits	% Whole	% Not	% Partially
NC 7	1.3	83.1	5.4	8.6
NC 9	0.7	86.6	2.4	8.4
NC-V 11	1.2	90.2	1.3	5.3
VA-C 92R	2.0	86.0	3.0	7.1

Table 15. Blanchability of medium kernels - average of two PVQE tests, 1988-1991

		Blanched		
Variety	% Splits	% Whole	% Not	% Partially
NC 7	1.0	67.2	16.0	14.1
NC 9	0.9	78.9	6.1	12.0
NC-V 11	1.5	85.0	4.0	7.4
VA-C 92R	1.9	75.6	8.7	11.9

Oil Quality

A comparison of oil quality of market grades from the 1988 increase plots (Table 16) shows VA-C 92R to have better shelf life than Florigiant, as indicated by lower iodine values and higher O/L ratios for all grades. Total saturated and long-chain-saturated fats are lower for VA-C 92R except for the No. 1 and oil stock grades. The P/S ratio was lower for all grades of VA-C 92R when compared with that of Florigiant.

Table 16. Oil quality of market grades from increase plots - 1988

Variety/Grade	Iodine Value[1]	O/L Ratio[2]	% Total Saturated	P/S Ratio	% Total Long-Chain-Saturated
Florigiant					
SMK	99.20	1.37	18.80	1.80	6.36
ELK	99.18	1.38	18.74	1.80	6.14
Med.	98.75	1.37	19.11	1.76	6.94
No. 1	101.14	1.20	18.81	1.92	6.83
No. 2	98.87	1.35	19.18	1.76	7.04
Oil Stock	101.17	1.04	20.47	1.85	7.57
VA-C 92R					
SMK	97.64	1.53	18.47	1.72	5.90
ELK	97.27	1.58	18.41	1.69	6.02
Med.	97.41	1.51	18.87	1.69	6.73
No. 1	99.83	1.24	19.47	1.81	7.12
No. 2	97.86	1.51	18.50	1.73	6.15
Oil Stock	100.19	1.07	20.97	1.77	7.72

[1]Lower iodine value indicates longer shelf life.
[2]Higher O/L ratio indicates longer shelf life.

Oil quality of sound mature kernels from four PVQE tests (Martin and Northampton Counties, North Carolina and Sussex County and Suffolk,

Virginia) from 1987 through 1991 was determined by analyzing the fatty acid composition for comparisons with other popular varieties. Calculations (iodine value and O/L ratio) from these analyses are indicators of shelf life and oil quality (Table 17). While VA-C 92R is not equal to NC 7, which has the best oil quality of any variety planted in the Virginia-Carolina production area, it is better than NC 9, NC 10C, or NC-V 11, all of which are acceptable to the peanut industry.

Table 17. Oil quality characteristics of sound mature kernels - average of four locations, 1987-1991

	Variety				
Characteristic	NC 7	NC 9	NC-V 11	NC 10C	VA-C 92R
Fatty Acid Composition (% of total)					
Palmitic	8.59e[1]	10.08b	10.23a	9.72c	9.44d
Stearic	3.50a	2.53d	2.25e	3.05b	2.92c
Oleic	56.77a	46.72d	46.97d	48.91c	50.11b
Linoleic	24.62e	33.95b	34.34a	32.05c	30.64d
Arachidic	1.59a	1.27d	1.15e	1.44c	1.46b
Eicosenoic	1.04c	1.15b	1.18a	0.96d	1.14b
Behenic	2.73bc	2.81b	2.50d	2.65c	2.92a
Lignoceric	1.16d	1.49a	1.38d	1.22c	1.36b
Iodine Value[2]	92.30e	99.90b	100.81a	98.33c	97.07d
O/L Ratio[3]	2.33a	1.38d	1.38d	1.53c	1.64b
Total Saturated (%)	17.56b	18.17a	17.50b	18.08a	18.10a
P/S Ratio	1.41e	1.88b	1.98a	1.78c	1.71d
Total Long-Chain-Saturated (%)	5.48b	5.57b	5.03d	5.31c	5.74a

[1]Duncan's New Multiple Range Test (0.05). Means sharing the same letter(s) are not statistically different. Comparison should be made across varieties only within an oil quality characteristic.
[2]Lower iodine value indicates longer shelf life.
[3]Higher O/L ratio indicates longer shelf life.

Oil and Protein Composition

Analysis of the chemical composition of the peanut seeds shows VA-C 92R to be similar to NC 7 for oil and protein percentages. VA-C 92R has 47.9% oil and 26.7% protein compared to 47.6% and 26.2%, respectively, for NC 7. This is a slight increase for both oil and protein for VA-C 92R, although it is not thought to be of any significance.

Processing Quality

Processor evaluation of in-shell market grades for roasting and salting indicated no difference between VA-C 92R and Florigiant except slightly darker pods for VA-C 92R. However, consumer ratings of flavor scores show no difference between the two varieties (Table 18).

Table 18. Summary of flavor scores[1] for all peanut products - 1988

	Variety	
Product	Florigiant	VA-C 92R
In-shell Grades		
Fancy Salted	2.9	2.9
Fancy Roasted	3.1	3.2
Extra Large Grade		
Oil Cooked	2.7	2.9
Old Fashioned	3.0	2.7
Home Cooked	3.2	3.0
Medium Grade		
Oil Cooked	2.8	2.8
No. 1 and No. 2 Grade		
Peanut Butter	2.7	2.4
Average Across all Products	2.9	2.8

[1]Flavor scores are based on a seven-point hedonic scale. The smaller the number, the more desirable the flavor.

Shelled extra large, medium, No. 1, and No. 2 market grades processed into consumer products did not reveal any significant difference by any processor between the two varieties. Because Florigiant has been a variety accepted by the peanut industry for the past 25 years for its taste and flavor characteristics, the overall ratings by consumer panelists would indicate VA-C 92R would be just as acceptable. It had a slightly higher rating for some products (Table 18), particularly peanut butter made from No. 1 and No. 2 market grades and salting of extra large (old fashioned and home cooked). Trained taste panelists also evaluated samples of VA-C 92R versus Florigiant and rated VA-C 92R similar to Florigiant for taste and flavor.

PRODUCTION TIPS

Current recommendations for the production of large-seeded virginia-type peanuts may be obtained through local county extension agent offices or research and extension publications. The following tips are from six years of observations during data collection and seed production of the newly released variety VA-C 92R.

General observations and ratings indicate VA-C 92R has very good to excellent seedling vigor (Table 19). This vigor causes rapid emergence of vigorous seedlings which begin growth without delay. This excellent emergence may be due to the exceptional ability of this variety to absorb the seed calcium that is vital for good germination. Kernel calcium content, measured in parts per million (ppm), is much greater for VA-C 92R than for any of the other popular varieties grown today (Table 20). Averages for four years show 37.5, 49.2, and 53.7% increases in kernel calcium content for VA-C 92R over NC-V 11, NC 7, and NC 9, respectively.

During seed production, where seeding rate was decreased in order to obtain maximum quantity of seed with minimum available seed, yield data indicated excellent yields could be obtained with reduced seeding rates for VA-C 92R. Yield from breeder seed in 1990 planted to six-inch intrarow seed spacing (50 lb/A) was approximately 4200 lb/A compared to yields of 4400 lb/A in test plots using 90 lb/A seed in the same field. In 1991 Melvin and Sammy Cox of Surry County, Virginia, growers of foundation seed, planted 650 pounds of seed on nine acres (72 lb/A), which yielded 5390 lb/A net compared to an average net yield of 4913 pounds per acre planted to other varieties at a higher seeding rate (100 lb/A) on the remainder of their

farm. In 1992 Larry Brown of Southampton County, Virginia, grower of registered seed, planted 75 lb/A seed of VA-C 92R in twin rows and obtained 3700 lb/A net yield compared to approximately 3300 lb/A net yield on the rest of his farm seeded with 100 lb/A to other varieties.

Table 19. Seedling vigor rating[1] for 1990 and 1991[2]

	North Carolina		Virginia		
Variety	Martin County	Northampton County	Sussex County	City of Suffolk	Mean
NC 7	3.1	2.6	3.1	2.8	3.0
NC 9	3.0	2.8	3.0	2.6	2.8
NC-V 11	2.1	2.0	2.6	2.3	2.2
VA-C 92R	1.8	2.0	1.9	1.8	1.8

[1]Rating: 1 = excellent, 2 = good, 3 = average, 4 = poor, and 5 = very poor.
[2]Ratings were taken 30-40 days after planting and are averages of six replications per location each year.

Table 20. Seed calcium content (ppm), 1988-1991[1]

Variety	1988	1989	1990	1991	Mean
NC 7	575	411	752	610	587
NC 9	602	378	732	567	570
NC-V 11	622	428	779	718	637
VA-C 92R	715	593	1181	1015	876

[1]Averages for each year are from four locations with three replications per location.

These data suggest that seeding rate is not as critical for VA-C 92R as with other varieties and perhaps less seed could be used while maintaining high yields. The excellent germination, seedling vigor, and rapid growth of this variety could also contribute to improved yields at lower seeding rates.

VA-C 92R appears to be equally susceptible to manganese deficiency as NC 7, which is one of its parents. The typical plant symptoms are yellowing of leaflet tissue between the veins, which remain dark green. If deficiency symptoms appear, application of recommended rates of foliar sprays of this trace element have corrected the deficiency just as well as with other currently grown varieties (Figure 4).

Because VA-C 92R produces plants with both shorter main stems and cotyledonary lateral branches, vine growth is such that there are no problems distinguishing row patterns during the digging operation, as with some varieties with vigorous vine growth. The runner (spreading) to intermediate plant growth habit with a somewhat prominent main stem also aids in the ease of distinguishing row patterns. After digging and inverting, the smaller vines of VA-C 92R tend to dry faster than do other varieties. This faster drying creates better conditions for combining (Table 21) and is a plus for producers because combining can start earlier and the plants spend less time in the windrow.

Table 21. Vine dryness rating[1] at combining - 1990[2]

Variety	North Carolina Martin County	Virginia Sussex County	Mean
NC 7	4	4	4.0
NC-V 11	3	1	2.0
NC 10C	5	4	4.5
VA-C 92R	1	1	1.0

[1]Rating: 1 = dry vines with excellent combine readiness, 4 = intermediate vine dryness, and 7 = green vines with poor combining conditions. Ratings are based solely on cultivar differences and do not imply weather conditions.

[2]Data are averages of three replications at each location.

The pod color of VA-C 92R, while not as bright as NC 9 or NC-V 11, is only slightly darker than NC 7. Most of the discolored pods are smaller, immature pods, some in the fancy in-shell market grade and very few in the jumbo in-shell market grade. Weather conditions during harvest have a dramatic effect on pod discoloration; however, with VA-C 92R the

discoloration also appears to be genetically inherited. Being able to harvest this variety with less time in the windrow should assist in maintaining good pod color.

While VA-C 92R is not resistant to any of the major peanut diseases, disease levels can be controlled just as effectively as with other varieties in production by following recommended control strategies. Fields with a history of CBR should be treated; disease losses can be expected to be equal to NC 7. Leafspot spray programs should provide adequate control of this disease. Sclerotinia blight may be less severe than with NC 7; however, yield losses can be expected. Losses from stem rot and pod rot complex diseases should be approximately equal to other varieties.

Reaction to infestations of insects has not been studied extensively. Limited data indicate VA-C 92R is similar to NC 9 and NC-V 11 in its susceptibility to tobacco thrips (*Frankliniella fusca* Hinds) and southern corn rootworm (*Diabrotica undecimpunctata howardi* Barber). However, recommended control programs for the production of high yields have proved effective in controlling all insect pests during the seven years of development of this new variety.

SUMMARY

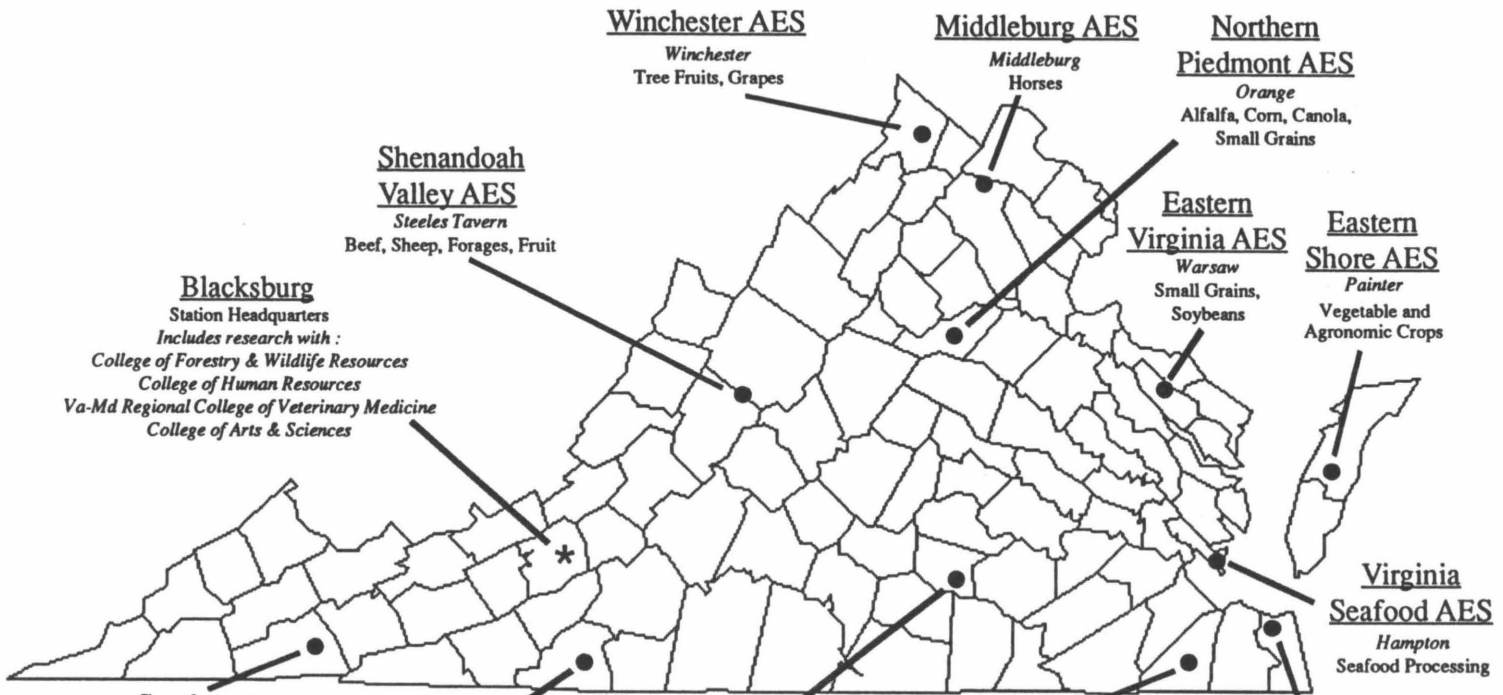
The release of the VA-C 92R peanut should provide growers with a new variety that will increase their net profits per acre by returning more dollar value per acre with the same or lower production cost. Higher yield will be the major contribution. Some cost savings may be realized by using lower seeding rates of VA-C 92R. Other advantages of VA-C 92R, over some varieties presently in production, may include more efficient uptake of calcium, reduced susceptibility to sclerotinia blight disease, easier digging, and faster drying in the windrow.

SEED SUPPLY

Commercial seed increase began in 1991. Foundation seed will be produced under the direction of the Virginia Crop Improvement Association Foundation Seed Farm, Mt. Holly, VA 22524 and the North Carolina Foundation Seed Producers, Inc., 8220 Riley Hill Road, Zebulon, NC 27597. Breeder seed will be maintained by the Tidewater Agricultural Experiment Station, P. O. Box 7099, Suffolk, VA 23437. A research fee will be charged for all classes of seed of VA-C 92R and an application has been filed for Plant Variety Protection.

Virginia Agricultural Experiment Station

College of Agriculture & Life Sciences



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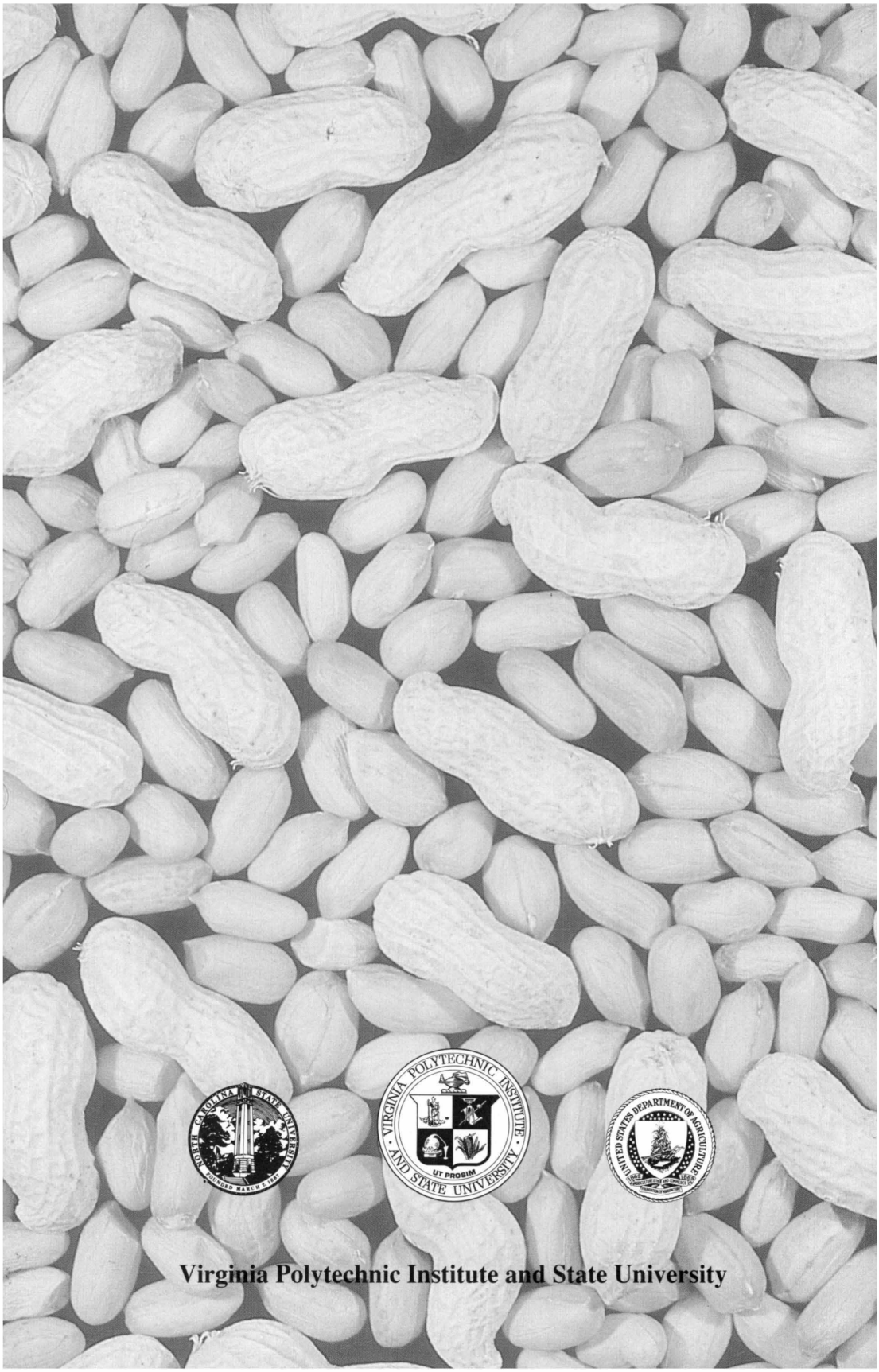
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