

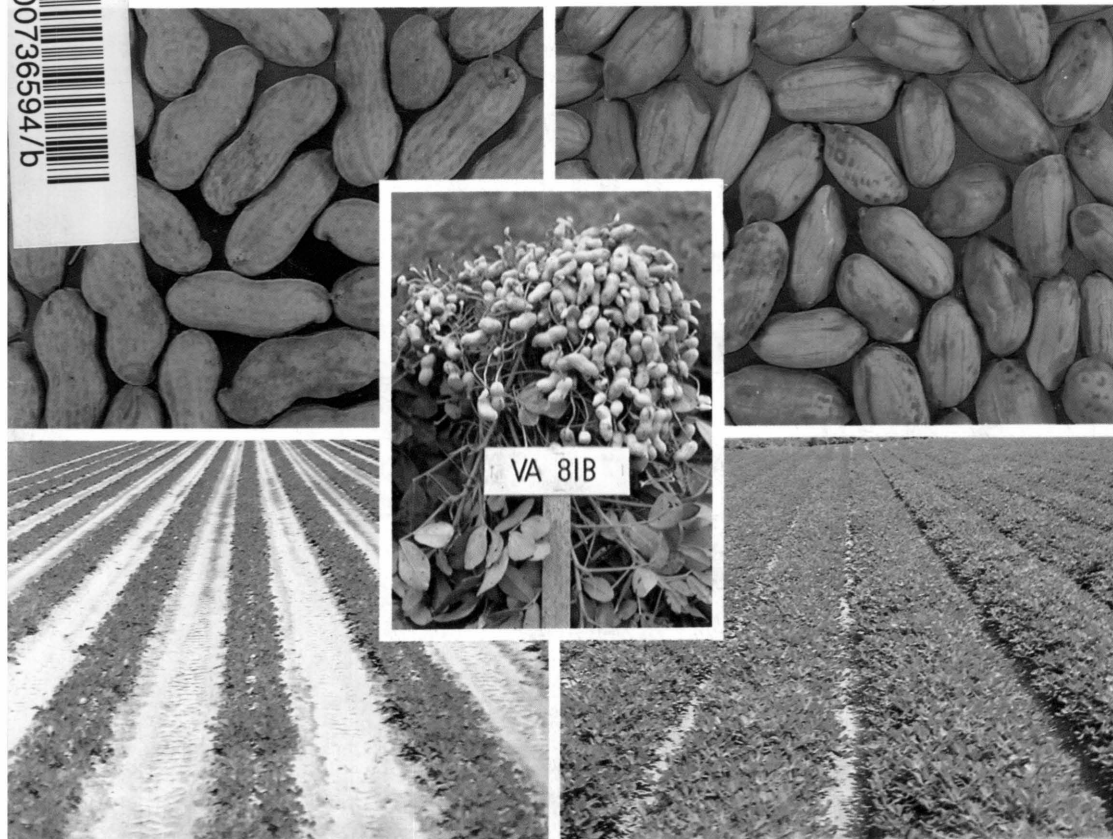
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Bulletin 84-1

The Virginia 81 Bunch Peanut (VA 81B)

T.A. Coffelt, R.W. Mozingo, D.M. Porter, and A.H. Allison



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The Virginia Agricultural and Mechanical College came into being in 1872 upon acceptance by the Commonwealth of the provisions of the Morrill Act of 1862 "to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life." Research and investigations were first authorized at Virginia's land-grant college when the Virginia Agricultural Experiment Station was established by the Virginia General Assembly in 1886.

The Virginia Agricultural Experiment Station received its first allotment upon passage of the Hatch Act by the United States Congress in 1887. Other related Acts followed, and all were consolidated in 1955 under the Amended Hatch Act which states "It shall be the object and duty of the State agricultural experiment stations . . . to conduct original and other researches, investigations and experiments bearing directly on and contributing to the establishment and maintenance of a permanent and effective agricultural industry of the United States, including the researches basic to the problems of agriculture and its broadest aspects and such investigations as have for their purpose the development and improvement of the rural home and rural life and the maximum contributions by agriculture to the welfare of the consumer . . ."

In 1962, Congress passed the McIntire-Stennis Cooperative Forestry Research Act to encourage and assist the states in carrying on a program of forestry research, including reforestation, land management, watershed management, rangeland management, wildlife habitat improvement, outdoor recreation, harvesting and marketing of forest products, and "such other studies as may be necessary to obtain the fullest and most effective use of forest resources."

In 1966, the Virginia General Assembly "established within the Virginia Polytechnic Institute a division to be known as the Research Division . . . which shall encompass the now existing Virginia Agricultural Experiment Station . . ."

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THE VIRGINIA 81 BUNCH PEANUT (VA 81B)

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INTRODUCTION

Peanuts are an important cash crop in Virginia, generally ranking fourth behind tobacco, corn and soybeans. However, production is limited to southeast Virginia where peanut is the number one cash crop. The gross farm value of the peanut crop reached a record high \$91,239,000 in 1981.

Peanut yields increased about 15 percent every five years until 1976. Since 1976, yields have remained steady, except for 1980 when severe drought reduced yields by two-thirds. Since 1976, the major limiting factor for yield has been diseases, the most important of which is Sclerotinia blight caused by *Sclerotinia minor* Jagger. This disease accounted for an estimated loss of 10.6 million dollars in farm income in 1981. Sclerotinia blight is found in about 50 percent of the peanut fields in Virginia and is also a problem in other U.S. peanut-producing states (North Carolina, Oklahoma and Texas), as well as other parts of the world.

Virginia 81 Bunch (VA 81B) is an early-maturing virginia-type peanut variety released in 1982 jointly by the U.S. Department of Agriculture, Agriculture Research Service and the Virginia Agricultural Experiment Station because of its resistance to *Sclerotinia minor*, earliness, and favorable agronomic traits. While not immune to this soilborne pathogen, VA 81B should provide increased yields over currently grown varieties when planted in infested fields.

ORIGIN

VA 81B was derived from a single plant selected in the F₇ generation from a cross of F 392-8 x GA 119-20. The former is a virginia-type peanut with a spreading growth habit from the Florida Agricultural Experiment Station. The latter is a virginia-type peanut cultivar with a bunch growth habit released in 1954 by the Georgia Agricultural Experiment Station. Seed from the individual plant selection were planted in a single row; all plants were harvested, and their seed bulked. Seed are being maintained by bulking in each succeeding generation. VA 81B was evaluated experimentally as VA 71-347.

PLANT AND FRUIT CHARACTERISTICS

The plants of VA 81B have an upright bunch growth habit. The lateral branches have alternate pairs of vegetative and reproductive leaf axils, characteristic of *Arachis hypogaea* L. subsp. *hypogaea* var. *hypogaea*. VA 81B has fewer primary (7 vs 10) and secondary (2 vs 12) branches than Florigiant. The foliage is similar in color to that of Florigiant.

The seed of VA 81B are pink with occasional black or brown flecks and slightly larger, about 10 percent more extra large kernels, than Florigiant. Seed are similar to Florigiant in shape. Pods are slightly constricted with moderately pronounced veination and with little pod pubescence. Two-seeded pods are the most common, with some single seeded pods, and very few three-seeded pods. Pods are slightly smaller, averaging about five percent less fancy size than Florigiant.

VA 81B matures up to 14 days earlier than Florigiant. Early maturity is an important characteristic for peanuts grown in Virginia, since only about 70 percent of the crop is usually harvested by October 21, the average frost date for southeast Virginia. Peanuts damaged by frost are unacceptable for the edible market.

PERFORMANCE

VA 81B is a high yielding, Sclerotinia blight-resistant peanut variety adapted to the peanut production areas of the United States. Yields are significantly higher than Florigiant when grown in fields infested with Sclerotinia blight, or in double-row high-population (87,000 plants/A) planting patterns (Tables 1 and 2). Yield potential is equal to Florigiant under other conditions (Tables 1, 3, 4 and 5).

When tested in date of digging and planting tests, VA 81B gives maximum yields and values when planted and dug to give a growing season of about 140 days or when 2400-2500 heat units have been reached (Tables 4 and 5). VA 81B should be harvested early or pod losses can be severe, as seen by low yields for the first planting date and last digging date. If planting has to be delayed beyond May 21, VA 81B performs better than other varieties due to its shorter growing season (Table 5).

QUALITY EVALUATIONS

VA 81B was compared with varieties presently being grown for various quality characteristics. These results are presented in Tables 6-15.

In milling tests, VA 81B had a higher percentage of extra large kernels, a lower percentage of No. 1 kernels, a higher percentage of fancy pods, and a higher total mill outturn than Florigiant (Table 6). No differences occurred between the two varieties for percentage of mediums, No. 2's, oil stock, pick outs, loose-shelled kernels, foreign material, or hulls. Grade characteristics of extra large kernels, medium, No. 1, and No. 2 grades for VA 81B were very similar to those for Florigiant (Tables 7 and 8). No differences were found between VA 81B and Florigiant for the analysis of the No. 2 and oil stock grades (Table 9). VA 81B had a higher percentage of fancy pods and lower count/lb than Florigiant (Table 10). Based on milling test results, VA 81B should be very acceptable to the milling industry.

Blanchability data for VA 81B, NC 6, NC 7, and Florigiant are means for two years (1979 and 1981), two locations each year, and two digging dates per location (Table 11). VA 81B did not blanch as well as Florigiant, but did blanch as well as NC 6 and NC 7 in these tests.

VA 81B has a lower iodine value and higher oleic/linoleic ratio than Florigiant (Table 12). VA 81B should have a longer shelf life than Florigiant, as indicated by the lower iodine and peroxide values (Tables 8 and 12).

The processing characteristics and analysis of peanut butter made from the No. 1 and No. 2 grades indicate that VA 81B has less roasting loss and a slightly higher butter outturn than Florigiant (Tables 13 and 14). Other characteristics are similar to Florigiant. Both varieties produced grade A peanut butter with acceptable flavor.

VA 81B was consistently rated by a consumer panel as having a better flavor than Florigiant for all products except the extra large-oil cooked (Table 15). The higher CLER scores for VA 81B (49.8) compared to Florigiant (44.1) also support the better flavor rating of VA 81B.

PRODUCTION POINTERS

Information concerning peanut culture, harvesting, processing, marketing and utilization has been compiled in the books *Peanuts, Culture and Uses* and *Peanut Science and Technology*, published by the American Peanut Research and Education Society in 1973 and 1982, respectively. Specific production recommendations for local areas are available in Cooperative Extension Service publications available from extension offices. The following discussion concerns research findings on the production of VA 81B. Growers are cautioned, as with any new peanut variety, to limit acreage planted to VA 81B until they have evaluated its performance on their farms.

General production practices with respect to fertility, landplaster, pesticide usage, and field preparation prior to planting for VA 81B are the same as those currently being used for other virginia-type peanut varieties. A grass crop, such as corn, should be rotated with peanuts as often as possible.

VA 81B has a very upright growth habit with few secondary branches and sets most of its fruit close to the taproot. Therefore, VA 81B seed should be spaced from two to three inches apart in 34 to 36 inch row widths or three to four inches apart in a twin-row planting pattern to obtain maximum yields. VA 81B does not compensate for poor stands as well as Florigiant; therefore, a good stand is essential in obtaining maximum yields.

VA 81B is less susceptible to Sclerotinia blight than the other currently grown U.S. varieties. However, under severe disease pressure, VA 81B will become infected. Growers should scout fields for early signs of this disease and use recommended fungicides when necessary. The open type canopy of VA 81B should make application of fungicides more effective.

Extensive evaluations in other tests have shown that VA 81B is susceptible to *Cylindrocladium* black rot or CBR (*Cylindrocladium crotalariae* [Loos] Bell and Sobers), tobacco thrips (*Frankliniella fusca* Hinds), southern corn rootworm (*Diabrotica undecimpunctata howardi* Barber), and white mold or stem rot (*Sclerotium rolfsii* Saccardo). VA 81B is very susceptible to leafspot (*Cercospora arachidicola* Hori and *Cercosporidium personata* [Berk. & Curt.] Deighton). Growers should use leafspot fungicides which have proven to be the most effective for their conditions. If the field has a history of Sclerotinia blight, fungicides used for leafspot control that have been shown to increase the severity of Sclerotinia blight should not be used. Extension personnel can provide this information for growers not familiar with this phenomenon.

Generally, VA 81B will not need the application of a growth regulator. However, under growing conditions conducive to vigorous growth, the application of a recommended growth regulator may be beneficial. The need for a growth regulator will vary from field to field as well as from year to year.

Pod losses can occur with VA 81B if plants are not harvested at optimum maturity. VA 81B is an early maturing variety that should be dug up to 14 days earlier than Florigiant. Depending on the growing season, growers in the Virginia-Carolina area should begin checking fields for maturity at 130 days after planting or after 2400-2500 effective heat units have been accumulated. Growers that utilize effective management with VA 81B can expect to harvest peanuts having high yields with excellent quality.

SUMMARY

VA 81B is an early maturing variety which is better adapted to planting patterns utilizing high seeding rates than Florigiant and matures up to 14 days earlier. VA 81B is less susceptible to *Sclerotinia* blight than current varieties, and should give increased yields over other varieties when planted in fields infested with *Sclerotinia minor*. VA 81B is susceptible to most other major peanut diseases and insects, especially leafspot. Milling, shelling, and processing characteristics of VA 81B are acceptable to processors, manufacturers, and consumers. VA 81B should be very useful to growers with a *Sclerotinia* blight problem, with a planting system utilizing high seeding rates, or with a shortened growing season.

SEED SUPPLY

Ample seed are available for commercial planting. Foundation seed will be produced under the direction of the Virginia Crop Improvement Association Foundation Seed Farm, Mt. Holly, VA 22524. Breeder seed will be maintained by the Tidewater Research Center, Suffolk, VA 23437.

Table 1. Evaluation of VA 81B and Florigiant for grade, yield, and value per acre in fields with and without Sclerotinia blight

Variety	Fields without Sclerotinia blight ¹					Fields with Sclerotinia blight ²					Disease ³
	Fancy %	ELK %	SMK %	Yield (lb/a)	Value (\$/a)	Fancy %	ELK %	SMK %	Yield (lb/a)	Value (1b/a)	
VA 81B	78 a ⁴	37 a	63 a	3617 a	762 a	71 b	41 a	65 a	3018 a	638 a	48 b
Florigiant	84 a	27 b	59 b	3370 a	652 b	76 a	30 b	63 a	2015 b	406 b	100 a

¹ Means from 7 tests conducted in 1973-1980 at Suffolk, Virginia.

² Means from 4 tests conducted in 1978-1979 at Boykins, Virginia.

³ Disease = Rating for VA 81B ÷ rating for Florigiant = % of infection of Florigiant.

⁴ Values within a column followed by the same letter are not significantly ($P > .05$) different according to Duncan's New Multiple Range Test.

Table 2. Evaluation of VA 81B and Florigiant at different plant populations and row spacings, for grade, yield, and value per acre in fields without (1977-1980) and a field with (1979) Sclerotinia blight

Variety-Row-Population	Fields without Sclerotinia blight					Fields with Sclerotinia blight				
	Fancy %	ELK %	SMK %	Yield (lb/a)	Value (\$/a)	Fancy %	ELK %	SMK %	Yield (lb/a)	Value (\$/a)
Florigiant-Single-High	66 ab ²	19 d	64 c	3099 ab	\$671 b	77 a	29 b	63 a	1652 b	\$334 b
" - " -Low	67 a	19 d	63 c	2975 bc	632 b	71 ab	29 b	64 a	1734 b	354 b
" -Double-	63 abc	19 d	63 c	2900 bc	615 b	69 ab	27 b	63 a	1679 b	338 b
" - " -High	62 c	18 d	63 c	2986 bc	639 b	68 ab	24 b	62 a	1452 b	291 b
VA 81B-Single-High	63 bc	29 c	65 ab	2961 bc	666 b	67 ab	41 a	64 a	2850 a	597 a
" - " -Low	63 abc	32 a	66 a	2798 c	638 b	71 ab	42 a	64 a	2913 a	608 a
" -Double-	60 c	30 bc	65 b	2916 bc	654 b	66 b	40 a	65 a	2841 a	598 a
" - " -High	63 bc	31 ab	66 ab	3243 a	735 a	62 b	40 a	65 a	2932 a	618 a
Mean-Florigiant	65 A	19 B	63 B	2990 A	639 B	71 A	27 B	63 A	1629 B	329 B
Mean-VA 81B	62 B	31 A	66 A	2980 A	673 A	67 B	41 A	65 A	2884 A	605 A

¹ Disease rating: 1 = no disease, 5 = dead plants.

² Values within a column followed by the same letter are not significantly ($P > .05$) different according to Duncan's New Multiple Range Test.

Table 3. Evaluation of VA 81B and Florigiant in 1979-1981 Peanut Variety and Quality Evaluation tests for grade, yield, value per acre, and maturity

Trait/Variety	Small Plots		Large Plots
	Digging I ¹	Digging II	
Fancy-%			
VA 81B	71	68	63
Florigiant	73	71	64
ELK-%			
VA 81B	36	35	29
Florigiant	26	29	18
SMK-%			
VA 81B	66	66	64
Florigiant	65	66	62
Yield-lbs/a			
VA 81B	3036	3128	2668
Florigiant	3142	3261	2768
Value-\$/a			
VA 81B	672	692	561
Florigiant	682	723	558
Mature Pods ² -%			
VA 81B	75	73	
Florigiant	53	47	

¹ Digging I is approximately two weeks earlier than Digging II.

² Mature Pods = Percentage of hulls with stained inner pericarp (stained hulls are mature) for 1979 and 1981 small plots.

Table 4. Evaluation of VA 81B, Florigiant, NC 6, and NC 7 in date of digging tests for yield and value per acre in 1981 and 1982

	Yield (lbs/a)	Value (\$/a)	Heat Units	No. Growing Days
Digging date #1 (9/14)			2399	134
VA 81B	4122	1032		
Florigiant	3804	851		
NC 6	4039	965		
NC 7	4092	1032		
Digging date #2 (9/28)			2570	148
VA 81B	4160	1062		
Florigiant	3721	937		
NC 6	3880	945		
NC 7	4001	1066		
Digging date #3 (10/12)			2693	162
VA 81B	3903	1012		
Florigiant	3728	979		
NC 6	3865	941		
NC 7	3721	1019		

Table 5. Evaluation of VA 81B, Florigiant, NC 6, NC 7 in date of planting tests for yield and value per acre in 1981 and 1982

	<u>Yield (lbs/a)</u>	<u>Value (\$/a)</u>	<u>Heat Units</u>	<u>No. Growing Days</u>
Planting date #1 (4/21)			2605	160
VA 81B	3320	825		
Florigiant	4016	1053		
NC 6	3713	978		
NC 7	4008	1106		
Planting date #2 (5/7)			2535	143
VA 81B	4024	1025		
Florigiant	4182	1091		
NC 6	3971	1025		
NC 7	4318	1169		
Planting date #3 (5/21)			2386	130
VA 81B	3751	957		
Florigiant	3714	927		
NC 6	3759	911		
NC 7	4024	1086		
Planting date #4 (6/3)			2171	116
VA 81B	3660	896		
Florigiant	3222	719		
NC 6	3282	704		
NC 7	3449	850		

Table 6. Evaluation of VA 81B and Florigiant for mill outturn in the Peanut Variety and Quality Evaluation tests in 1979-1980

Trait/Variety	Straight Shelling ¹		Jumbo and Fancy Removed	
	VA 81B	Florigiant	VA 81B	Florigiant
% ELK	25.6	15.2	9.4	6.4
% Mediums	22.2	25.2	10.8	12.0
% No. 1	8.9	15.2	5.5	10.1
% No. 2	7.2	6.2	4.7	5.1
% Oil stock	1.2	1.5	1.0	1.4
% Pick outs	1.2	1.1	1.1	1.3
% LSK	1.0	1.0	1.2	1.0
% Total outturn	67.1	65.3	79.4	72.0
% FM	3.7	4.2	3.4	4.3
% Hulls	29.3	30.6	17.3	23.7
% Jumbo	—	—	0.7	0.8
% Fancy	—	—	45.0	33.9

¹ Straight shelling is shelling of farmer's stock peanuts without removing Jumbo and Fancy pod sizes.

Table 7. Grade characteristics of ELK, Medium, No. 1, and No. 2 grades for VA 81B and Florigiant in the Peanut Variety and Quality Evaluation tests in 1979-1980 for straight shelling and in 1979 with the jumbo and fancy removed

Grade/Variety	Count/lb.			% Splits			% Damaged			% Fall Through ¹		
	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 81B	506	533		1.1	1.3		0.3	0.3		1.3	1.3	
Florigiant	498	503		0.8	1.3		0.1	0.0		1.0	1.3	
Mediums												
VA 81B	623	646		0.7	1.8		0.7	0.3		0.9	1.8	
Florigiant	613	623		0.7	0.5		0.3	0.0		0.5	0.3	
No.1												
VA 81B	885	905		2.2	3.3		0.5	0.0		2.3	3.0	
Florigiant	881	844		2.0	1.5		0.5	0.0		2.0	1.5	
No. 2												
VA 81B	--	--		57.8	35.0		0.3	0.0		2.8	7.0	
Florigiant	--	--		44.3	25.5		0.3	0.0		4.6	5.3	

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's stock peanuts without removing Jumbo and Fancy pod sizes.

Table 8. Evaluation of raw extra large kernels for VA 81B and Florigiant in the Peanut Variety and Quality Evaluation tests in 1979-1980

Character	VA 81B	Florigiant
Count/lb.	504.0	500.0
% Splits	1.5	1.5
% Blanched	0.2	0.8
% Moisture	5.9	5.8
% Oil	48.6	49.5
% Protein	27.8	28.7
Peroxide value ¹	1.2	1.4
% Free fatty acid	0.06	0.06

¹ Lower Peroxide values indicate longer shelf-life.

Table 9. Analysis of No. 2 and oil stock grades of VA 81B and Florigiant in the Peanut Variety and Quality Evaluation tests in 1979 and 1980

Characteristic	Grade			
	No. 2		Oil Stock	
	VA 81B	Florigiant	VA 81B	Florigiant
% FM	0.01	0.01	0.4	1.4
% Moisture	6.7	6.6	7.8	7.9
% Free fatty acids	0.4	0.3	1.9	1.4
% Oil	44.3	44.2	34.9	36.5
Lbs. oil/ton	832	829	646	676
% Protein	29.3	30.6	29.3	30.6
Lbs. 45% protein/ton	1323	1357	1294	1354

Table 10. Grade percentages and characteristics of fancies in 1979 for VA 81B and Florigiant

Grade Characteristic	Variety	
	VA 81B	Florigiant
Percent	45.0	33.9
Count/lb.	182.0	194.0
% Fall through	1.0	0.8
% Cracked or broken	3.0	2.5
% Discolored	1.2	1.3
% Other defects	0.0	0.0
% FM	0.0	0.0
% Total external defects	4.2	3.8
% Damaged	0.0	0.0
% Moisture	6.0	6.1

Table 11. Laboratory evaluation of VA 81B, NC 6, NC 7 and Florigiant for blanchability

Grade/Variety	Blanched	
	% Splits	% Whole
ELK		
VA 81B	5.6	83.0
NC 6	2.5	83.4
NC 7	4.5	86.6
Florigiant	4.8	87.9
Medium		
VA 81B	5.5	80.8
NC 6	2.7	71.0
NC 7	3.5	75.3
Florigiant	4.2	87.4

Table 12. Comparison of fatty acid composition, iodine values, and oleic/linoleic ratios for VA 81B and Florigiant in 1980 and 1981

Characteristic	VA 81B	Florigiant
Fatty Acid ¹		
Palmitic	10.14	10.39
Stearic	2.62	2.86
Oleic	51.97	48.11
Linoleic	28.48	31.22
Arachidic	1.30	1.40
Eicosenoic	1.19	1.19
Behenic	2.74	3.10
Lignoceric	1.59	1.76
Iodine value ²	94.96	96.39
O/L Ratio ³	1.843	1.555

¹ Fatty acids are expressed as per cent of total fatty acid content.

² Iodine values were calculated according to the formula: (% oleic) (.8601) + (% linoleic) (1.7321) + (% eicosenoic) (.7854).

³ O/L ratio is the % oleic ÷ % linoleic.

Table 13. Processing and quality evaluation of No.1 and No. 2 grade VA 81B and Florigiant peanuts into peanut butter for the 1979-1980 Peanut Variety and Quality Evaluation tests

Characteristic	VA 81B	Florigiant
% Roasting loss	5.2	7.4
% Hearts	1.1	0.8
% Skins	3.0	3.0
% Pickouts	0.1	0.1
% Butter outturn	90.8	89.4
Flavor score ¹	2.7	2.8

¹ Flavor scores are based on a seven-point hedonic scale; the lower the score, the more desirable the flavor.

Table 14. Analysis of peanut butter for VA 81B and Florigiant in 1979 and 1980

Characteristic	VA 81B	Florigiant
Extraneous material	None	None
Texture	Smooth	Smooth
Type	Stabilized	Stabilized
Water insoluble inorganic residue	5.5	4.0
Salt content (%)	0.75	1.12
Color range	2.5	2.0
Factors:		
Color (Max. 20)	19.5	19.0
Consistency (Max. 20)	18.5	18.5
Absence of defects (Max. 30)	28.0	27.5
Flavor and aroma (Max. 30)	26.5	28.0
Total	92.5	93.0
USDA Grade	A	A

Table 15. Comparison of VA 81B and Florigiant flavor scores in 1979 and 1980

Product	Flavor Scores ¹	
	VA 81B	Florigiant
Peanut butter	2.7	2.8
Medium - oil cooked	2.5	2.6
Extra large - dry roasted	2.7	3.2
Extra large - oil cooked	2.5	2.4
Mean - all products	2.6	2.8
CLER scores ²	49.8	44.1

¹ Flavor scores are based on a seven-point hedonic scale; the lower the score, the more desirable the flavor.

² CLER—Critical laboratory evaluation roast; the higher the number, the more desirable the flavor.

Virginia's Agricultural Experiment Stations

- 1—Blacksburg
Virginia Tech
- 2—Steeles Tavern
Shenandoah Valley Research Station
- 3—Orange
Piedmont Research Station
- 4—Winchester
Winchester Fruit Research Laboratory
- 5—Middleburg
Virginia Forage Research Station
- 6—Warsaw
Eastern Virginia Research Station
- 7—Suffolk
Tidewater Research and Continuing Education Center
- 8—Blackstone
Southern Piedmont Research and Continuing Education Center
- 9—Critz
Reynolds Homestead Research Center
- 10—Glade Spring
Southwest Virginia Research Station
- 11—Hampton
Seafood Processing Research and Extension Unit

