Abstract

GUSMINI, GABRIELE. Breeding watermelon (*Citrullus lanatus*) for resistance to gummy stem blight (*Didymella bryoniae*) (under the direction of Todd C. Wehner, Ph.D.)

Gummy stem blight, caused by *Didymella bryoniae* (Auersw.) Rehm is a major disease of watermelon [*Citrullus lanatus* (Thunb.) Matsum. & Nakai] in the U.S. Plant breeders need sources of resistance that can be incorporated into adapted breeding lines to keep epidemics of this disease under acceptable control.

We tested all the available accessions from the United States Department of Agriculture, Agricultural Research Service (USDA-ARS) watermelon germplasm collection, including *C. lanatus* var. *citroides*, for resistance to gummy stem blight.

To perform the screen, we adopted the following protocol: 1) we used spores from a virulent isolate (or mixture of virulent isolates) grown for 2 to 3 weeks on Potato Dextrose Agar under artificial white light (12 hour photoperiod); 2) we used as inoculum a water suspension of spores in deionized water (5×10^5 spores/ml); 3) we ensured high relative humidity immediately after inoculation (with the presence of free-water on the leaves of test plants), by irrigating the field and using a clear plastic disease chamber in the greenhouse with artificial mist; 4) prior to inoculation we injured the trichomes of the leaves by brushing the plants with a wood stake.

Our experiment was a randomized complete block with 1,332 cultigens (elite cultivars, obsolete cultivars, breeding lines, PI accessions, and cucumber checks), two assays (field and greenhouse), two or four replications, and two to six plants per plot.

Cultigens were significantly more or less resistant than the resistant check PI 189225 and the susceptible check 'Charleston Gray'. PI 279461, PI 482379, PI 254744, PI 526233, PI 482276, PI 271771, PI 164248, PI 244019, PI 296332, and PI 490383 were selected as the most resistant cultigens, based on low mean rating for gummy stem blight, similar reaction in field and greenhouse, low standard deviation, and high number of replicates. The most susceptible cultigens, based on high mean rating for gummy stem blight, similar reaction in field and greenhouse, low standard deviation, and high number of replicates, were: PI 183398, PI 169286, PI 223764, PI 226445, PI 525084, and PI 534597.

Further analysis of the group of the most resistant PI accessions suggested that resistance to gummy stem blight in watermelon might be determined by a single gene (or a unique set of genes) with different pleiotropic effects at the juvenile stage in the greenhouse and at the adult stage in the field. For marketing of cultivars in drier climates (i.e. southwestern U.S.), where gummy stem blight typically appears at the seedling stage during transplant production, due to high relative humidity and warm temperatures in greenhouses, it should be sufficient to develop cultivars highly resistant in the greenhouse and moderately resistant in the field. In years of extraordinary humid weather, gummy stem blight in the field would be controlled with an integrated pest management program, while in regular year of dry weather it would not affect the crop.

BREEDING WATERMELON (*Citrullus lanatus*)

FOR RESISTANCE TO GUMMY STEM BLIGHT (*Didymella bryoniae*)

by

GABRIELE GUSMINI

A thesis submitted to the Graduate Faculty of

North Carolina State University

in partial fulfillment of the

requirements for the Degree of

Master of Science

HORTICULTURAL SCIENCE

Raleigh

2003

APPROVED BY:

Edward S. Buckler, Ph.D.	Gerald J. Holmes, Ph.D.

Todd C. Wehner, Ph.D.
Chair of Advisory Committee

Biography

I was born in the North part of Italy in 1973 (December, 12th) and raised close to Milano. At the age of 13 I decided that I wanted an education both classical and scientific. Indeed, I chose to accomplish my first desire during high school and the second at the University. I spent the following five years studying Classical Greek, Latin, and Italian Languages and Literature, Philosophy, History, and Art, along with basics of Physics, Chemistry, Mathematics, and Biology. When I went to the University, I enrolled at the University of Perugia with a major in Agricultural Science. At the end of my second year I decided to re-join my family and I transferred to the University of Milano with the same major and a minor in Nursery Production, Horticulture, Floriculture and Viticulture. I received my bachelor's degree in 1998.

During my years at the University and later on I worked in different areas either as a consultant, a director, and an entrepreneur.

In December 2000, I decided to go back to school and seek a higher level of education in a foreign country in Agricultural Sciences. Therefore, I moved to the United States (U.S.).

Now I am looking forward to completing my Master of Science degree in Plant Breeding, continue my education through the Ph.D. and then work as a watermelon-breeder for a private seed company in the U.S.

Acknowledgments

I would like to acknowledge whoever in the last two years helped me with my research and education and in particular Dr. Todd Wehner for being my Major Professor, Dr. Gerald Holmes, and Dr. Ed Buckler for being my Advisors, Dr. Doug Sanders for being my Extension Mentor, and Tammy Ellington, Nihat Guner and Julia Jenkins for all the efforts that they put into my experiments.

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1. INTRODUCTION

Watermelon [*Citrullus lanatus* (Thunb.) Matsum. & Nakai] is a major vegetable crop in the U.S. with a total production in 2001 of about two million tons of marketable fruit (U.S.D.A.-A.R.S., 2001).

Gummy stem blight caused by *Didymella bryoniae* (Auersw.) Rehm [=*Mycosphaerella citrullina* (C.O.Sm.) Gross. and *Mycosphaerella melonis* (Pass) Chiu & Walker] and its anamorph *Phoma cucurbitacearum* (Fr.:Fr.) Sacc. [=*Ascochyta cucumis* Fautrey & Roum] (Keinath et al., 1995) is one of the most destructive diseases of this crop. Resistance to gummy stem blight in watermelon was ranked for several years by U.S. researchers as the third priority for germplasm evaluation after bacterial fruit blotch and Fusarium wilt.

Gummy stem blight was first described by Fautrey and Roumeguere in France as the disease caused on cucumber by *Ascochyta cucumis* in 1891 (Chiu and Walker, 1949; Sherf and Mac Nab, 1986). In 1917, gummy stem blight was reported for the first time in the U.S. affecting watermelon fruit from Florida (Sherbakoff, 1917), where it is still an important limiting factor for the watermelon industry (Keinath, 1995; Schenck, 1962). The most recent and highly severe gummy stem blight epidemic occured on watermelon in the Southeastern U.S. in 1991, when over 15% of the watermelon acreage in South Carolina was abandoned before harvest (Power, 1992). In addition, severe economic losses have been reported during transportation and in storage due to the disease commonly known on fruit as black rot (Leupschen, 1961; Norton, 1978; Sowell and Pointer, 1962).

Gummy stem blight on watermelon plants is evident as crown blight, stem cankers, and extensive defoliation (Maynard and Hopkins, 1999). The symptoms may be observed on the cotyledons, hypocotyls, leaves, and fruit (Maynard and Hopkins, 1999). *D. bryoniae* is a seed- (Lee et al., 1984), air- (van Steekelenburg, 1983), and soil-borne fungus (Bruton, 1998; Keinath, 1996). Therefore, the presence of vegetable debris in the field favors its survival during the winter. *D. bryoniae* is resistant to extreme temperatures such as –9°C for 14 days (van Steekelenburg, 1983). A recent study showed that *D. bryoniae* can survive on buried watermelon vines at different depths in the soil, but it cannot be recovered after 6 to 7 months, because the antagonistic activity of saprophytic soil microorganisms seems to eliminate the pathogen resident in watermelon debris (Keinath, 2002).

Pycnidia and pseudothecia seen as black fruiting bodies on the disease lesions can be collected: *D. bryoniae* is easily cultured *in vitro* and spores can be harvested for artificial inoculations (van Steekelenburg, 1983; Zitter et al., 1996).

An important factor favoring either artificial or natural inoculations is the presence of wounds, particularly on old leaves (van Steekelenburg, 1985a). Since *D. bryoniae* is a facultative necrotroph (Svedelius, 1990), the production of exudates from the lesions helps the fungus in its growth and infection (Blakeman, 1971) as well as a stimulation to spore germination seems to derive by the emission of volatile compounds from the leaf surface (Pharis et al., 1982). A high incidence of insects or the presence of other diseases such as powdery mildew increased the spread of gummy stem blight in the field (Bergstrom and Knavel, 1982), due to weakness of the plants and presence of wounds as a consequence of the insect feeding damage.

High relative humidity is essential for the growth of this fungus and successful inoculations, but only the presence of free water on the plants will cause severe disease on leaves and stems (van Steekelenburg, 1981, 1984, 1985a).

There is no evidence of race specialization for this pathogen. In cucumber, eight isolates from diverse geographic areas of the world did not show any difference for pathogenicity based on cluster analysis, and resistance to gummy stem blight in cucumber was defined as non-specific (St. Amand and Wehner, 1995a). However, isolates cultured *in vitro* on artificial *media* tend to decrease in pathogenicity over time. Therefore, to ensure the success of the inoculations, breeders and pathologists usually use a mixture of isolates to test cucurbits for resistance to *D. bryoniae*.

Several methods, such as seed treatment (Rankin, 1954), timing the application of fungicides (Keinath, 1995, 2000), and soil amendment with cabbage residues (Keinath, 1996), have been applied to control this disease. Recently, it has been suggested that leaf extracts and essential oils of certain plants could be used to suppress the growth of *D. bryoniae* (Fiori et al., 2000). However, adequate control of gummy stem blight through fungicide applications and good cultural practices is difficult, particularly during periods of frequent rainfall when relative humidity remains high for a long period. There have been reports of acquired resistance of *D. bryoniae* to fungicides (Kato et al., 1984; Keinath and Zitter, 1998; Malathrakis and Vakalounakis, 1983; Miller et al., 1997; van Steekelenburg, 1987). Genetic resistance to gummy stem blight has received attention (Norton et al., 1986; Norton et al., 1993, 1995), and would be preferable to other methods if resistant germplasm can be identified and used to develop adapted cultivars.

Methods of seedling screening for resistance to gummy stem blight have been reported in watermelon (Boyhan et al., 1994; Dias et al., 1996), muskmelon (Zhang et al., 1997), squash (Zhang et al., 1995), and cucumber (St. Amand and Wehner, 1995b; Wehner and St. Amand, 1993; Wehner and Shetty, 2000). These studies shared a similar inoculation technique, based on spraying the seedlings with a water suspension of spores collected from *in vitro* cultures of the pathogen. Spore concentration in screening cucurbits for resistance to gummy stem blight differed among experiments and species: 10^5 spores/ml in watermelon (Boyhan et al., 1994), squash (Zhang et al., 1995), and melon (Zhang et al., 1997); 10^6 spores/ml (St. Amand and Wehner, 1995a, b; van Steekelenburg, 1981; Wehner and St. Amand, 1993) or 10^7 spores/ml in cucumber (van Deer Meer et al., 1978). Different parts of the plants were rated for susceptibility after inoculation: true leaves only (St. Amand and Wehner, 1995a, b; van Deer Meer et al., 1978; van Steekelenburg, 1981), true leaves and stems separately (Zhang et al., 1995; Zhang et al., 1997), and the whole plant (Boyhan et al., 1994; Wehner and St. Amand, 1993). Inoculation of cotyledons was tested and shown to be unreliable for resistance to gummy stem blight (Chiu and Walker, 1949; van Deer Meer et al., 1978; Wyszogrodzka et al., 1986).

Correlation between greenhouse and field ratings has been tested in cucumber for a set of cultivars and USDA-ARS Plant Introduction (PI) accessions (hereafter collectively referred to as cultigens). The correlation coefficient (r) was high only for certain inoculation treatments (dawn-inoculation at the third true leaf stage) and very low for all other treatments (St. Amand and Wehner, 1995b). In melon, correlation between field and greenhouse tests was high: the inoculation technique was optimized and only data for the most susceptible and most resistant cultigens were used. This was due to the finding that cultigens intermediate in response to inoculation reacted inconsistently (Zhang et al., 1997). This approach, however, seems to be statistically unacceptable, because the arbitrary deletion of data would invalidate the assumption of normality in the distribution of the data. Therefore, the Pearson correlation coefficient should not be calculated. Regression analysis of greenhouse data over field data would be a better approach to predict field resistance based on greenhouse assays.

Gummy stem blight testing has shown some differences among commercial cultivars of watermelon. 'Congo' was the least susceptible, 'Fairfax' was intermediate, and 'Charleston Gray' was the most susceptible (Schenck, 1962). PI□89225 was the most resistant of 439 accessions evaluated from the USDA-ARS watermelon germplasm collection (Sowell and Pointer, 1962). Several years later, PI□71778 (intermediate in gummy stem blight resistance between PI□89225 and 'Charleston Gray') was identified as an additional source of resistance (Sowell, 1975). A later screening effort of 138 watermelon accessions showed that PI□00335, PI□05590, PI□12373, PI□64247, and PI□00334 were resistant to gummy stem blight (Boyhan et al., 1994). Resistance in PI□89225 was controlled by a single recessive gene (Norton, 1979).

Resistant watermelon cultivars were developed from two crosses ('Jubilee' □ PI□71778, 'Crimson Sweet' □ PI□89225) by selecting disease-resistant seedlings from backcrossed families that produced high yield of excellent quality fruit (Norton et al., 1986). 'AU–Jubilant' and 'AU–Producer' (Norton et al., 1986), 'AU–Golden Producer' (Norton et al., 1993), and 'AU–Sweet Scarlet' (Norton et al., 1995) were released with moderate to high resistance to anthracnose, Fusarium wilt, and gummy stem blight. These cultivars were shown to be much less resistant to gummy stem blight than the resistant parents PI□89225 and PI□71778.

However, so far no cultivars of watermelon (Sumner and Hall, 1993), muskmelon (McGrath et al., 1993), or cucumber (Wehner and St. Amand, 1993; Wehner and Shetty, 2000) have been released that have high resistance to natural epidemics of gummy stem blight in open fields.

The objective of this study was to evaluate the entire available USDA-ARS watermelon germplasm collection for resistance to gummy stem blight using commercial cultivars as reference points.

2. MATERIALS AND METHODS

2.1 Location and Seed Sources

We conducted all our experiments at the North Carolina State University Plant Pathology Greenhouses in Raleigh, NC, and at the Horticultural Crops Research Station in Clinton, NC. All *Citrullus* PI accessions were obtained from the Southern Regional Plant Introduction Station at Griffin, GA. The checks were 51 watermelon cultivars, along with a set of 7 cucumber cultivars, to provide reference points for gummy stem blight resistance (Table 1). Countries with the most accessions in the collection of 1,274 were Turkey (294), Yugoslavia (164), Zimbabwe (122), India (120), Spain (70), Zambia (55), South Africa (34), Syria (28), Iran (27), and China (26) (Table 2).

2.2 Fungal Isolates

We isolated the strains of *D. bryoniae* from diseased cucumber tissues harvested from naturally infected plants in Charleston, SC, in 1998. In 2001 we reisolated the strains of *D. bryoniae* from plants which were artificially inoculated with the 1998-collected isolates in isolation in our greenhouses. We adopted the following isolation technique. 1) We identified pycnidia with a microscope and transferred them to Petri plates containing PDA (25 ml/Petri plate). 2) In the first subculture on artificial *medium*, we selected the isolates based on macroscopic observations: colonies dark in color and showing concentric circles of growth were kept and transferred to fresh PDA. 3) When the cultures did not appear contaminated by other fungi or bacteria, we transferred them to a *medium* containing 25%

PDA to stimulate abundant sporulation. 4) We observed the spores to verify that their shape and size matched those of *D. bryoniae* (Zitter et al., 1996).

For long term storage (Dhingra and Sinclair, 1995), we 1) transferred the fungus on a disc of sterile filter paper (Whatman #2, 70 mm diameter) overlapping a layer of PDA in a Petri plate, 2) subcultered the fungus for 2 to 4 weeks, 3) dehydrated the filter paper disk and the mycelium for 12 to 16 hours at room temperatures (24±3 °C) under a sterile laminar-flow hood, 4) cut the filter paper in squares (5×5 mm), and 5) stored them in sterile test-tubes in a refrigerator (3±1 °C) in the dark.

2.3 Inoculum Preparation

For all assays, *D. bryoniae* was grown on Petri plates containing 25 ml potato dextrose agar (PDA). We incubated infested Petri plates for 2 to 4 weeks at 24 ± 2°C under alternating periods of 12 hours of fluorescent light (40 to 90 $\mu mol \cdot m^{-2} \cdot sec^{-1}$ PPFD) and 12 hours of darkness until pycnidia formed. For all inoculations, we prepared a spore suspension by flooding the culture plates with 5 to 10 ml of sterile, distilled water, and scraping the surface of the agar to remove the spores from the mycelia. We filtered the liquid from each plate through 4 layers of sterile cheese-cloth to remove dislodged agar and part of the mycelium. The final pH of the inoculum was not adjusted. We measured spore concentration with a hemacytometer and adjusted to a concentration of 5×10^5 spores/ml adding deionized water. Immediately before inoculation, Tween 80 (0.06 g/l) was added to the inoculum to keep the spores well dispersed in the solution.

2.4 Inoculation Procedure

In the greenhouse assay, we inoculated plants at the second true leaf stage, after damaging the trichomes on the leaf surface by brushing the plants with a wood stake. The sprayer was a hand-pumped spray bottle (EcoLogical, Sprayco, Michigan). Immediately before inoculation, we moved the plants into a humidity chamber with clear-plastic walls (top open during the summer, top closed during the winter to keep the internal temperature close to 24 °C, the optimum for *D. bryoniae*). We used humidifiers in the chamber (Model 500, Trion, Sanford, NC) running continuously for the treatment time (1 day before inoculation through 3 days after inoculation) to keep the relative humidity close to 100% day and night. Plants were watered daily using overhead sprinklers, except when humidifiers were running.

In the field assay, we inoculated plants when they reached the fourth-true-leaf stage, after irrigating with approximately 12 mm of water during the two previous days to promote guttation on the day of inoculation, and damaging the trichomes on the leaf surface by brushing the plants with a wood stake mounted at the end of a aluminum straight handle. Plants were inoculated two to three times (at two weeks intervals) by spraying the inoculum onto all upper leaf surfaces at dawn. We delivered the inoculum as a fine mist using a backpack sprayer operated at the pressure of 200 to 275 kP (30 to 40 psi). After inoculation, we irrigated at 4 p.m. the same day, with approximately 12 mm of water, to promote fungal growth and disease outbreak with high relative humidity at night.

2.5 Experimental Design

We performed our field and greenhouse assays in 1998, 1999, 2000, and 2001. We retested the most resistant and most susceptible cultigens from the previous years of screening in 2000 (35 cultigens) and 2001 (70 cultigens).

Field plots were 1.5 m long with 1 plant (1998), 3 plants (1999, 2000), or 2 plants (3 for the retest) (2001) each. Seeds were planted on shaped beds 1.5 m apart (center to center), or 3 m apart in the retest (2000, 2001). Plots were separated at each end by 1.5 m alleys. Guard rows of watermelon susceptible cultivars planted on continuous plot surrounded each test.

Greenhouse temperatures averaged 23 to 43°C (8 a.m. to 8 p.m.) and 12 to 24°C (8 p.m. to 8 a.m.) for the seasons when the experiments were performed. We seeded directly in plastic pots (100×100 mm size, 600 ml volume, Kord Corp., Lugoff, SC) filled with a soilless mix of peat, vermiculite, and perlite (etromix 220, Grace/Sierra, Milpitas, CA). We used more than 1 seed per pot to ensure a good plant stand, and then we thinned the seedlings to reach the desired number of plants per pot (2 in the screenings and 1 in the retests), and assembled pots to form the plots (2 pots per plot in the screenings and 3 pots per plot in the retests). We used a randomized complete block design for both assays (field and greenhouse) and for all tests.

2.6 Disease Assessment Scale

In the greenhouse plants were rated for disease severity three weeks after inoculation. In the field plants were rated for disease severity when symptoms began to appear on the leaves and stems of the susceptible checks. Instead of the interval Horsfall-Barratt scale, we adopted an ordinal disease assessment scale, being: 0 = immune; 1 = yellowing on leaves (suspect of disease only); 2 to 4 = symptoms on leaves only; 5 = some leaves dead, no symptoms on stem; 6 to 8 = symptoms on leaves and stems; 9 = plant dead (Table 3). We preferred this disease assessment scale, because it allowed us to record lesions either on leaves or on stems. Leaf ratings are important, because plant yield and survival is affected by leaf area, which is reduced by severe disease outbreaks. Stem ratings are important, because large, localized lesions can kill the plant, especially if located near the crown (base) of the plant.

2.7 Data Analysis

Data were analyzed using the MEANS, ANOVA, and CORRELATION procedures of SAS-STAT Statistical Software Package (SAS Institute, Cary, NC). Data were summarized as mean, number of replications (each replications was a combination of year, season, and assay), and standard deviation over replications. Data were standardized (mean=4.5, standard deviation=1.5) using the STANDARD procedure of SAS-STAT to reduce variability over years, locations, and rater. The standardization procedure resulted in small changes in rank: cultigens that were resistant remained resistant and correlation between standardized and non-standardized ratings was high and significant (r=0.71, p-value=0.0001). The most resistant cultigens were chosen as having a low mean disease severity rating, a similar reaction in field and greenhouse, a low standard deviation, and data from many replications for both assays. The most susceptible cultigens were chosen as having a high mean disease severity rating, a similar reaction in field and greenhouse, a low standard deviation, and many replications for both assays.

Table 1. Seed sources for the watermelon and cucumber cultivars used as checks in the evaluation of the USDA-ARS watermelon germplasm for resistance to gummy stem blight.

Cultivar	Institution or Breeder
Watermelon	
Allsweet	University of Kansas
AU-Golden Producer	Auburn University
AU-Jubilant	Auburn University
AU-Producer	Auburn University
AU-Sweet Scarlet	Auburn University
Black Diamond	Watson Seeds
Black Diamond, Yellow Flesh	Unknown
Blackstone	Southeastern Vegetable Breeding Lab., USDA-ARS
Cream of Saskatchewan	Unknown
Calhoun Gray	Calhoun Research Station
Calsweet	Mr. Layton
Charleston Gray	Southeastern Vegetable Breeding Lab., USDA-ARS
Congo	Southeastern Vegetable Breeding Lab., USDA-ARS
Crimson Sweet	University of Kansas, KS
Dixielee	University of Florida, FL
Early Canada	Unknown
Fairfax	Southeastern Vegetable Breeding Lab., USDA-ARS
Florida Favorite	Unknown
Garrisonian	Southeastern Vegetable Breeding Lab., USDA-ARS
Golden Honey	Robson Seeds
Graybelle	Robson Seeds
Jubilee	University of Florida
King & Queen	Unknown
Kleckley Sweet	W.A. Kleckley
Klondike Stripe	Unknown
Mickylee	University of Florida
Minilee	University of Florida
Navajo Sweet	Unknown
NH Midget	University of New Hampshire
Peacock Shipper	R. Peacock
Peacock Striped	R. Peacock
Peacock WR60	R. Peacock
Petite Sweet	University of Kansas
Red'N'Sweet	Calhoun Research Station
Regency	Seminis Vegetable Seeds - Petoseed
Smoky Lee	University of Florida
Starbrite	Seminis Vegetable Seeds - Asgrow

Table 1 (Continued).

Stars'N'Stripes	Seminis Vegetable Seeds - Asgrow
Sugar Baby	Mount Hardin
Summer Gold	Abbott & Cobb
Super Gold	Abbott & Cobb
Super Sweet	University of Kansas
Sweet Princess	North Carolina State University
Tastigold	Unknown
Tendergold	Unknown
Tendersweet Orange Flesh	Unknown
Verona	Mississippi State University
Yellow Baby	Unknown
Yellow Crimson	Unknown
Yellow Rose	Syngenta Seeds - Rogers
Yellow Shipper	Unknown
Cucumber	
Homegreen 2	University of Wisconsin
Slice	Clemson University
MM 76	Cornell University
Clinton	North Carolina State University
Poinsett 76	Cornell University
NCSU M-17	North Carolina State University
Wisconsin SMR 18	University of Wisconsin

Table 2. Countries of origin and number of PI accessions from each, and number of watermelon and cucumber cultivars (checks) that were evaluated for resistance to gummy stem blight.

Country of origin	Number	Country of origin	Number
Afghanistan	015	Mauritania	001
Algeria	002	Mexico	007
Angola	001	Moldova	001
Argentina	001	Namibia	001
Australia	001	New Zealand	001
Belize	006	Nigeria	022
Bolivia	001	Pakistan	016
Botswana	007	Paraguay	003
Brazil	002	Philippines	008
Cameroon	002	Portugal	001
Chad	001	Senegal	011
Chile	002	Somalia	007
China	026	Spain	070
Cuba	001	South Africa	034
Egypt	017	Sudan	006
El Salvador	001	Soviet Union	020
Ethiopia	009	Swaziland	004
Ghana	013	Syria	028
Greece	006	Taiwan	002
Guatemala	004	Thailand	001
Honduras	001	Tunisia	002
Hungary	013	Turkey	295
India	120	Ukraine	002
Indonesia	004	United States	018
Iran	027	Uruguay	001
Iraq	003	Uzbekistan	006
Israel	007	Venezuela	004
Italy	002	Yugoslavia	164
Japan	014	Zaire	009
Kenya	002	Zambia	055
Korea	007	Zimbabwe	122
Lebanon	008	**PI accessions (total)**	**1274**
Liberia	001	Watermelon cultivars	051
Maldives	013	Cucumber cultivars	007
Mali	012	**Total lines tested**	**1332**

Table 3. Disease assessment scale for greenhouse and field assay for testing resistance to gummy stem blight in watermelon.

GSB[1] rating	Description of symptoms
0	no symptoms
1	yellowing on leaves (suspect of disease only)
2	moderate symptoms (<20% necrosis) on leaves only
3	slight symptoms (21-45% necrosis) on leaves only
4	severe symptoms (>45% necrosis) on leaves only
5	some leaves dead, no symptoms on stem
6	moderate symptoms (<20% necrosis) on leaves, with necrosis also on petioles and stem (<3 mm long)
7	slight symptoms (21-45% necrosis) on leaves, with necrosis also on petioles and stem (3-5 mm long)
8	severe symptoms (>45% necrosis) on leaves, with necrosis also on petioles and stem (>5 mm long)
9	plant dead

[1] GSB = gummy stem blight

3. RESULTS AND DISCUSSION

The analysis of variance (Table 4) showed a significant cultigen effect overall the screening, and in the greenhouse and field assays separately. The F ratio for the field assay was lower than for the greenhouse assay. Therefore, the greenhouse assay was slightly more accurate in detecting differences in levels of resistance to gummy stem blight between cultigens. The LSD (α=0.05), was 0.23 in the field and 0.30 in the greenhouse. The range/LSD ratio also can be used to determine the strength of a test in separating the means and it attributed high efficacy to our screening experiment (12.25 overall, 20.33 for the greenhouse assay, and 28.70 for the field).

Two different measures of repeatability were estimated: repeatability over years (Table 5) and over replications within year and assay (Table 6). Gummy stem blight showed extreme variability in previous screenings for resistance in cucumber (Wehner and Shetty, 2000; Wyszogrodzka et al., 1986), melon (Zhang et al., 1997), squash (Zhang et al., 1995), and watermelon (Boyhan et al., 1994). In our screening repeatability over years was low, but significant, being the correlation coefficient r between 0.10 and 0.36; therefore, many years of testing are needed to correctly rank watermelon cultigens for resistance to this disease. Gummy stem blight outbreaks are highly influenced by environmental conditions such as relative humidity, ventilation, and temperatures (van Steekelenburg and Vooren, 1980; van Steekelenburg, 1984, 1985a, b). Therefore, low correlation between years may be the result of differences in environmental conditions. The greenhouse environment was difficult to control consistently in Van Steekelenburg's studies and it may have been an important cause of low repeatability in our screening. We statistically controlled the effect of environmental variation in our screening by repeating the test in multiple years and using many replications per test. In the greenhouse the use of the humidity chamber largely reduced the possible influence of relative humidity and ventilation of the greenhouse on pathogen development. In the field, relative humidity was influenced by irrigation, but the disease was more uniform and consistent in years with light and constant rainfalls at the time of inoculation. Furthermore, the testing of such a high number of cultigens in each test implied the use of large areas (typically 2 to 4 acres per test), surrounded by woods in our research station: it is reasonable to assume, therefore, that environmental variation within the same field was high, with respect to relative humidity and temperatures, particularly from the borders to the center of the field, due to the effect of the woods in reducing the speed of the wind and, therefore, leaf wetness duration. Our assumption is further confirmed by the high and significant correlation between adjacent replications in the field and the low and non significant correlation between replications further apart, particularly evident in field tests with high number of replications in the field (Table 6 - 2000, field and greenhouse screening tests). Repeatability over replications was, therefore, significanly higher in the greenhouse than in the field tests, since greenhouse conditions within year were more uniform.

Greenhouse and field assays were highly and significantly correlated in melon (Zhang et al., 1997), and cucumber (St. Amand and Wehner, 1995b). Our screening showed low correlation between field and greenhouse assays in watermelon (Table 7). Watermelon breeders typically screened the watermelons in greenhouses (Norton, 1979), or inoculated the seedlings in the greenhouse and then transplanted the survivors in the field (Norton et al., 1986; Norton et al., 1993, 1995; Sowell and Pointer, 1962). These techniques were used to select resistant PI accessions by Sowell and to release gummy stem blight resistant cultivars by Norton between 1978 and 1995, but the level of field resistance of these cultivars was moderate, highly variable, and, therefore, not satisfactory. Furthermore, the level of resistance in these cultivars was much lower than in the resistant parents PI 189225 and PI 271778. We suggest, based on inheritance tests that we are currently performing, that resistance to gummy stem blight is controlled from more than a single recessive gene, as stated by Norton (Norton, 1979). Norton himself in a previous report indicated that resistance in both PI 189225 and PI 271778 was "due to two independent and different recessive gene pairs" (Norton, 1978). We think that the *db* gene might have a major effect, but it needs to be complemented by the expression of other "minor" genes, present in the original PI accessions and lacking in the released cultivars. We believe that Norton's testing method based mainly on greenhouse assays could not detect the expression of the minor genes or of other major genes, possibly activated by environmental factors that do not vary in the greenhouse as much as in the fields. Therefore, our screening design combined greenhouse and field assays to overcome the discrepancy between selections in greenhouse and use of cultivars in open fields. Furthermore, watermelons in the U.S. are typically seeded in flats in the greenhouse and later transplanted in open fields and gummy stem blight is a major pest both in transplant production greenhouses and in crop production fields.

We selected the 40 most resistant and 40 most susceptible cultigens. We believe that a recurrent selection breeding program might be helpful in the development of a highly resistant germplasm and 20 or 40 entries are typically used (table 8) in population improvement breeding designs.

We selected ten cultigens with low mean disease severity rating and low variability for reaction to gummy stem blight both in field and greenhouse: PI 279461, PI 482379,

PI 254744, PI 526233, PI 482276, PI 271771, PI 164248, PI 244019, PI 296332, and PI 490383. We discarded cultigens tested in a low number of replications as non-representative of their typical reaction to the disease. These selections will be used in the future for inheritance studies, development of resistant inbreds, pyramiding genes (should a multi-loci hypothesis be confirmed by inheritance and allelism studies), and development of resistant cultivars by backcross breeding. The six most consistently susceptible cultigens were selected, to be used as susceptible non adapted checks, along with adapted susceptible cultivars, during future breeding efforts: PI 183398, PI 169286, PI 223764, PI 226445, PI 525084, and PI 534597.

Seeking a verification of our hypothesis of different mechanisms of resistance at the juvenile stage in the greenhouse and at the adult stage in the fields, we calculated the correlation between greenhouse and field ratings for the 35 most resistant cultigens; we discarded five cultigens present in less then three replications in both assays. Correlation was negative ($r=-0.72$): resistance in greenhouse and field, at the juvenile and adult stage respectively, therefore might depend upon different mechanisms (Figure 1). Furthermore, these mechanisms might be regulated by the same single gene or set of genes with different pleiotropic effects in the two environments, as the negative correlation shows. Therefore, we also suggested a classification of the most resistant PI accessions for juvenile greenhouse resistance and adult field resistance separately (Tables 9 and 10).

Lastly, mean disease assessments for greenhouse and field assays for all 1,332 cultigens tested (PI accessions, and watermelon and cucumber cultivars) are presented in appendix (Table 11).

Table 4. Analysis of variance of the gummy stem blight ratings of the evaluated USDA-ARS watermelon germplasm.

Source	df	SS	MS	F ratio	P value
Dependent variable: overall rating					
Cultigen	1,406	10,114.61	7.59	4.00	0.0001
Error	20,398	39,775.64	1.90		
Dependent variable: greenhouse rating					
Cultigen	1,330	8,962.84	6.74	3.81	0.0001
Error	12,436	22,010.66	1.77		
Dependent variable: field rating					
Cultigen	1,326	5,759.01	4.34	2.37	0.0001
Error	6,637	12,157.75	1.83		

Table 5. Correlations of ratings between years for watermelon resistance to gummy stem blight.

Pairs of years	GSB[1] rating (r)
1998 vs. 1999	0.27**
1998 vs. 2000	0.26**
1998 vs. 2001	0.36**
1999 vs. 2000	0.23**
1999 vs. 2001	0.10*
2000 vs. 2001	0.32**

[1] GSB = gummy stem blight

*, ** r-value significant at p-value≤0.05 or p-value≤0.01, respectively

Table 6. Correlations of ratings between replications within year (1998-2001), assay (field and greenhouse), and experiment (screening and retest) for watermelon resistance to gummy stem blight.

Year	Assay [1]	Set [2]	Pair of replications	r
1998	Field	S	Rep 01 vs. rep 02	0,11 **
1998	G.house	S	Rep 01 vs. rep 02	0,67 **
			Rep 01 vs. rep 03	0,48 **
			Rep 01 vs. rep 04	0,37 **
			Rep 02 vs. rep 03	0,69 **
			Rep 02 vs. rep 04	0,47 **
			Rep 03 vs. rep 04	0,62 **
1999	Field	S	Rep 01 vs. rep 02	0,78 **
			Rep 01 vs. rep 03	0,56 **
			Rep 01 vs. rep 04	0,20 **
			Rep 01 vs. rep 05	0,21 **
			Rep 01 vs. rep 06	0,25 **
			Rep 02 vs. rep 03	0,58 **
			Rep 02 vs. rep 04	0,22 **
			Rep 02 vs. rep 05	0,26 **
			Rep 02 vs. rep 06	0,27 **
			Rep 03 vs. rep 04	0,21 *
			Rep 03 vs. rep 05	0,27 *
			Rep 03 vs. rep 06	0,05 ns
			Rep 04 vs. rep 05	0,79 **
			Rep 04 vs. rep 06	0,71 **
			Rep 05 vs. rep 06	0,82 **
1999	G.house	S	Rep 01 vs. rep 02	0,75 **
			Rep 01 vs. rep 03	0,65 **
			Rep 01 vs. rep 04	0,62 **
			Rep 01 vs. rep 05	0,12 **
			Rep 01 vs. rep 06	0,12 **
			Rep 01 vs. rep 07	0,11 **
			Rep 01 vs. rep 08	0,14 **
			Rep 02 vs. rep 03	0,83 **
			Rep 02 vs. rep 04	0,81 **
			Rep 02 vs. rep 05	0,10 **
			Rep 02 vs. rep 06	0,12 **
			Rep 02 vs. rep 07	0,14 **
			Rep 02 vs. rep 08	0,20 **
			Rep 03 vs. rep 04	0,88 **
			Rep 03 vs. rep 05	0,10 *
			Rep 03 vs. rep 06	0,10 ns

Table 6 (Continued).

			Rep 03 vs. rep 07	0,10	ns
			Rep 03 vs. rep 08	0,13	*
			Rep 04 vs. rep 05	0,10	ns
			Rep 04 vs. rep 06	0,03	ns
			Rep 04 vs. rep 07	0,14	ns
			Rep 04 vs. rep 08	-0,01	ns
			Rep 05 vs. rep 06	0,71	**
			Rep 05 vs. rep 07	0,55	**
			Rep 05 vs. rep 08	0,43	**
			Rep 06 vs. rep 07	0,72	**
			Rep 06 vs. rep 08	0,53	**
			Rep 07 vs. rep 08	0,79	**
2000	Field	S	Rep 01 vs. rep 02	0,77	**
			Rep 01 vs. rep 03	0,35	ns
			Rep 01 vs. rep 04	0,20	**
			Rep 01 vs. rep 05	0,16	ns
			Rep 01 vs. rep 06	-0,01	ns
			Rep 01 vs. rep 07	0,14	ns
			Rep 01 vs. rep 08	0,15	ns
			Rep 01 vs. rep 09	0,10	ns
			Rep 01 vs. rep 10	0,01	ns
			Rep 01 vs. rep 11	-0,12	ns
			Rep 01 vs. rep 12	0,08	ns
			Rep 02 vs. rep 03	0,61	*
			Rep 02 vs. rep 04	0,18	ns
			Rep 02 vs. rep 05	0,15	ns
			Rep 02 vs. rep 06	0,01	ns
			Rep 02 vs. rep 07	0,22	ns
			Rep 02 vs. rep 08	0,19	ns
			Rep 02 vs. rep 09	-0,13	ns
			Rep 02 vs. rep 10	0,19	ns
			Rep 02 vs. rep 11	-0,04	ns
			Rep 02 vs. rep 12	0,38	ns
			Rep 03 vs. rep 04	0,21	ns
			Rep 03 vs. rep 05	0,22	ns
			Rep 03 vs. rep 06	0,38	ns
			Rep 03 vs. rep 07	0,62	*
			Rep 03 vs. rep 08	0,39	ns
			Rep 03 vs. rep 09	1,00	
			Rep 03 vs. rep 10	0,07	ns
			Rep 03 vs. rep 11	0,52	ns
			Rep 03 vs. rep 12	-1,00	

Table 6 (Continued).

			Rep 04 vs. rep 05	0,78	**
			Rep 04 vs. rep 06	0,65	**
			Rep 04 vs. rep 07	0,10	ns
			Rep 04 vs. rep 08	0,24	*
			Rep 04 vs. rep 09	0,20	ns
			Rep 04 vs. rep 10	0,01	ns
			Rep 04 vs. rep 11	0,16	ns
			Rep 04 vs. rep 12	-0,11	ns
			Rep 05 vs. rep 06	0,69	**
			Rep 05 vs. rep 07	0,13	ns
			Rep 05 vs. rep 08	0,18	ns
			Rep 05 vs. rep 09	0,10	ns
			Rep 05 vs. rep 10	-0,04	ns
			Rep 05 vs. rep 11	0,18	ns
			Rep 05 vs. rep 12	0,03	ns
			Rep 06 vs. rep 07	-0,08	ns
			Rep 06 vs. rep 08	-0,07	ns
			Rep 06 vs. rep 09	-0,23	ns
			Rep 06 vs. rep 10	-0,01	ns
			Rep 06 vs. rep 11	0,17	ns
			Rep 06 vs. rep 12	-0,03	ns
			Rep 07 vs. rep 08	0,84	**
			Rep 07 vs. rep 09	0,64	**
			Rep 07 vs. rep 10	0,11	ns
			Rep 07 vs. rep 11	0,12	ns
			Rep 07 vs. rep 12	-0,09	ns
			Rep 08 vs. rep 09	0,72	**
			Rep 08 vs. rep 10	0,09	ns
			Rep 08 vs. rep 11	0,11	ns
			Rep 08 vs. rep 12	-0,28	ns
			Rep 09 vs. rep 10	-0,01	ns
			Rep 09 vs. rep 11	0,03	ns
			Rep 09 vs. rep 12	-0,61	ns
			Rep 10 vs. rep 11	0,73	**
			Rep 10 vs. rep 12	0,69	**
			Rep 11 vs. rep 12	0,70	**
2000	G.house	S	Rep 01 vs. rep 02	0,76	**
			Rep 01 vs. rep 03	0,54	**
			Rep 01 vs. rep 04	0,44	**
			Rep 01 vs. rep 05	0,05	ns
			Rep 01 vs. rep 06	0,07	ns
			Rep 01 vs. rep 07	0,04	ns

Table 6 (Continued).

Rep 01 vs. rep 08	0,10	ns
Rep 01 vs. rep 09	0,30	**
Rep 01 vs. rep 10	0,29	**
Rep 01 vs. rep 11	0,26	**
Rep 01 vs. rep 12	0,13	*
Rep 01 vs. rep 13	0,10	ns
Rep 01 vs. rep 14	0,03	ns
Rep 01 vs. rep 15	0,01	ns
Rep 02 vs. rep 03	0,74	**
Rep 02 vs. rep 04	0,61	**
Rep 02 vs. rep 05	0,08	ns
Rep 02 vs. rep 06	0,07	ns
Rep 02 vs. rep 07	0,05	ns
Rep 02 vs. rep 08	0,05	ns
Rep 02 vs. rep 09	0,32	**
Rep 02 vs. rep 10	0,39	**
Rep 02 vs. rep 11	0,30	**
Rep 02 vs. rep 12	0,14	*
Rep 02 vs. rep 13	0,11	ns
Rep 02 vs. rep 14	0,09	ns
Rep 02 vs. rep 15	0,10	ns
Rep 03 vs. rep 04	0,79	**
Rep 03 vs. rep 05	0,14	*
Rep 03 vs. rep 06	0,05	ns
Rep 03 vs. rep 07	-0,02	ns
Rep 03 vs. rep 08	0,02	ns
Rep 03 vs. rep 09	0,28	**
Rep 03 vs. rep 10	0,40	**
Rep 03 vs. rep 11	0,28	*
Rep 03 vs. rep 12	0,14	*
Rep 03 vs. rep 13	0,12	ns
Rep 03 vs. rep 14	0,08	ns
Rep 03 vs. rep 15	0,07	ns
Rep 04 vs. rep 05	0,15	*
Rep 04 vs. rep 06	0,04	ns
Rep 04 vs. rep 07	0,01	ns
Rep 04 vs. rep 08	0,03	ns
Rep 04 vs. rep 09	0,25	**
Rep 04 vs. rep 10	0,35	**
Rep 04 vs. rep 11	0,19	ns
Rep 04 vs. rep 12	0,15	*
Rep 04 vs. rep 13	0,19	**

Table 6 (Continued).

Rep 04 vs. rep 14	0,15	ns
Rep 04 vs. rep 15	0,08	ns
Rep 05 vs. rep 06	0,67	**
Rep 05 vs. rep 07	0,46	**
Rep 05 vs. rep 08	0,33	**
Rep 05 vs. rep 09	-0,01	ns
Rep 05 vs. rep 10	0,06	ns
Rep 05 vs. rep 11	0,06	ns
Rep 05 vs. rep 12	0,26	**
Rep 05 vs. rep 13	0,28	**
Rep 05 vs. rep 14	0,22	**
Rep 05 vs. rep 15	0,14	ns
Rep 06 vs. rep 07	0,71	**
Rep 06 vs. rep 08	0,52	**
Rep 06 vs. rep 09	-0,03	ns
Rep 06 vs. rep 10	-0,03	ns
Rep 06 vs. rep 11	-0,03	ns
Rep 06 vs. rep 12	0,26	**
Rep 06 vs. rep 13	0,23	**
Rep 06 vs. rep 14	0,21	**
Rep 06 vs. rep 15	0,12	ns
Rep 07 vs. rep 08	0,72	**
Rep 07 vs. rep 09	-0,04	ns
Rep 07 vs. rep 10	0,01	ns
Rep 07 vs. rep 11	0,01	ns
Rep 07 vs. rep 12	0,18	**
Rep 07 vs. rep 13	0,17	**
Rep 07 vs. rep 14	0,13	ns
Rep 07 vs. rep 15	0,06	ns
Rep 08 vs. rep 09	0,02	ns
Rep 08 vs. rep 10	0,01	ns
Rep 08 vs. rep 11	0,05	ns
Rep 08 vs. rep 12	0,13	ns
Rep 08 vs. rep 13	0,12	ns
Rep 08 vs. rep 14	0,09	ns
Rep 08 vs. rep 15	0,01	ns
Rep 09 vs. rep 10	0,80	**
Rep 09 vs. rep 11	0,63	**
Rep 09 vs. rep 12	0,10	ns
Rep 09 vs. rep 13	0,14	*
Rep 09 vs. rep 14	0,13	*
Rep 09 vs. rep 15	0,20	**

Table 6 (Continued).

			Rep 10 vs. rep 11	0,77	**
			Rep 10 vs. rep 12	0,19	**
			Rep 10 vs. rep 13	0,18	**
			Rep 10 vs. rep 14	0,06	ns
			Rep 10 vs. rep 15	0,10	ns
			Rep 11 vs. rep 12	0,17	*
			Rep 11 vs. rep 13	0,23	**
			Rep 11 vs. rep 14	0,19	*
			Rep 11 vs. rep 15	0,17	ns
			Rep 12 vs. rep 13	0,76	**
			Rep 12 vs. rep 14	0,60	**
			Rep 12 vs. rep 15	0,51	**
			Rep 13 vs. rep 14	0,76	**
			Rep 13 vs. rep 15	0,59	**
			Rep 14 vs. rep 15	0,77	**
2000	Field	R	Rep 01 vs. rep 02	0,59	**
			Rep 01 vs. rep 03	0,58	**
			Rep 01 vs. rep 04	0,29	ns
			Rep 01 vs. rep 05	0,14	ns
			Rep 01 vs. rep 06	0,06	ns
			Rep 02 vs. rep 03	0,66	**
			Rep 02 vs. rep 04	0,50	**
			Rep 02 vs. rep 05	0,32	ns
			Rep 02 vs. rep 06	0,18	ns
			Rep 03 vs. rep 04	0,44	ns
			Rep 03 vs. rep 05	0,27	ns
			Rep 03 vs. rep 06	0,32	ns
			Rep 04 vs. rep 05	0,35	ns
			Rep 04 vs. rep 06	-0,03	ns
			Rep 05 vs. rep 06	0,30	ns
2000	G.house	R	Rep 01 vs. rep 02	0,37	*
			Rep 01 vs. rep 03	0,86	**
			Rep 01 vs. rep 04	0,47	*
			Rep 01 vs. rep 05	0,48	*
			Rep 01 vs. rep 06	0,37	*
			Rep 02 vs. rep 03	0,42	*
			Rep 02 vs. rep 04	0,14	ns
			Rep 02 vs. rep 05	0,08	ns
			Rep 02 vs. rep 06	-0,01	ns
			Rep 03 vs. rep 04	0,53	**
			Rep 03 vs. rep 05	0,57	**
			Rep 03 vs. rep 06	0,43	*

Table 6 (Continued).

			Rep 04 vs. rep 05	0,56 **
			Rep 04 vs. rep 06	0,49 **
			Rep 05 vs. rep 06	0,65 **
2001	Field	S	Rep 01 vs. rep 02	0,18 ns
			Rep 01 vs. rep 03	0,04 ns
			Rep 01 vs. rep 04	0,07 ns
			Rep 02 vs. rep 03	-0,06 ns
			Rep 02 vs. rep 04	-0,04 ns
			Rep 03 vs. rep 04	0,26 *
2001	G.house	S	Rep 01 vs. rep 02	0,14 ns
			Rep 01 vs. rep 03	0,21 **
			Rep 01 vs. rep 04	0,06 ns
			Rep 02 vs. rep 03	0,21 **
			Rep 02 vs. rep 04	0,04 ns
			Rep 03 vs. rep 04	0,04 ns
2001	Field	R	Rep 01 vs. rep 02	0,41 *
			Rep 01 vs. rep 03	0,06 ns
			Rep 01 vs. rep 04	0,41 ns
			Rep 02 vs. rep 03	-0,04 ns
			Rep 02 vs. rep 04	0,18 ns
			Rep 03 vs. rep 04	0,25 ns
2001	G.house	R	Rep 01 vs. rep 02	0,49 **
			Rep 01 vs. rep 03	0,58 **
			Rep 01 vs. rep 04	0,54 **
			Rep 02 vs. rep 03	0,51 **
			Rep 02 vs. rep 04	0,55 **
			Rep 03 vs. rep 04	0,62 **

[1] Assay: fd=field, gh=greenhouse

[2] Set: sc=screening of 1,274 PI accessions + checks, rt=retest of the most resistanr and most susceptible PI accessions (38 in 2000 and 75 in 2001) + checks

*, ** F-value significant at p-value≤0.05 or p-value≤0.01, respectively

Table 7. Correlations of ratings between assays (field and greenhouse) for watermelon resistance to gummy stem blight..

Year of field vs. greenhouse test	GSB[1] rating (r)
1998	0.12**
1999	0.20**
2000	0.24**
2001	0.18*
Overall	0.30**

[1] GSB = gummy stem blight

*, ** r-value significant at p-value≤0.05 or p-value≤0.01, respectively

Table 8. Overall, field, and greenhouse average disease rating for the most resistant and the most susceptible PI accessions, and checks (cultivars and PI accessions) evaluated for resistance to gummy stem blight.

Cultigen identification		Gummy stem blight rating [1]							
		Overall		Greenhouse			Field		
Name	Source	Y	□	n	Y	□	n	Y	□
40 most resistant PI accessions									
PI 279461 [2]	Japan	2.3	1.3	8	2.8	1.5	6	1.7	0.6
PI 482379 [2]	Zimbabwe	2.6	0.9	8	2.6	0.5	7	2.6	1.2
PI 254744 [2]	Senegal	2.6	1.8	11	3.0	2.0	10	2.1	1.5
PI 526233 [2]	Zimbabwe	2.7	1.1	10	2.4	0.8	2	4.2	1.1
PI 482276 [2]	Zimbabwe	2.7	1.0	11	2.5	1.1	6	3.1	0.6
PI 271771 [2]	South Africa	2.8	2.1	20	2.7	2.1	3	4.0	1.2
PI 164248 [2]	Liberia	2.8	2.0	8	3.0	1.1	7	2.4	2.7
PI 244019 [2]	South Africa	2.8	2.0	23	3.2	2.2	14	2.3	1.5
PI 296332 [2]	South Africa	2.9	1.2	7	2.7	1.4	6	3.1	0.9
PI 296339	South Africa	2.9	1.1	1	2.9	0.0	6	2.9	1.2
PI 490383 [2]	Mali	2.9	1.5	13	3.4	1.0	5	1.6	2.0
PI 379243	Yugoslavia	2.9	1.8	10	3.5	0.9	6	2.1	2.7
PI 296337	South Africa	3.0	0.8	9	2.7	0.8	5	3.6	0.6
PI 271770	South Africa	3.0	1.1	27	2.7	1.1	16	3.7	0.8
PI 490375	Mali	3.0	1.6	7	2.8	1.9	5	3.2	1.1
PI 512398	Spain	3.0	0.8	9	3.1	0.8	3	2.8	0.7
PI 482315	Zimbabwe	3.0	1.3	11	3.2	0.9	8	2.8	1.7
PI 482283	Zimbabwe	3.0	1.5	18	3.2	1.1	16	2.8	1.9
PI 482284	Zimbabwe	3.0	1.6	17	3.5	1.6	9	2.2	1.5
PI 532666	Swaziland	3.0	1.3	2	3.7	0.2	5	2.7	1.5
PI 249009	Nigeria	3.0	1.6	7	3.8	1.6	5	2.0	0.8
PI 296343	South Africa	3.1	1.5	8	2.7	1.0	6	3.5	2.1
PI 490384	Mali	3.1	1.4	8	2.7	1.0	4	3.9	1.8
PI 512388	Spain	3.1	0.9	9	2.8	0.8	6	3.7	0.8
PI 482257	Zimbabwe	3.1	1.5	11	2.9	1.1	7	3.5	2.0
PI 211915	Iran	3.1	1.7	23	3.0	1.7	8	3.4	1.8
PI 508443	Korea	3.1	1.6	7	3.2	1.5	4	3.0	1.8
PI 542114	Botswana	3.1	1.3	11	3.2	1.3	3	3.1	1.6
PI 241689	Chile	3.1	1.1	11	3.3	1.1	3	2.0	0.2
PI 500312	Zambia	3.1	1.1	11	3.6	1.0	7	2.3	0.7
PI 271982	Somalia	3.2	1.4	2	0.9	0.3	7	3.8	0.7
PI 247398	Greece	3.2	2.0	2	1.5	4.1	7	3.6	1.1
PI 195771	Guatemala	3.2	1.7	6	2.3	1.2	4	4.7	1.4

Table 8 (Continued).

PI 227203	Japan	3.2	1.8	6	2.4	1.1	4	4.4	2.0
PI 435990	China	3.2	1.9	8	2.5	1.7	3	5.2	0.2
PI 319237	Japan	3.2	2.5	11	2.8	2.3	6	4.0	2.9
PI 512361	Spain	3.2	1.1	9	2.8	0.8	4	4.1	1.4
PI 542123	Botswana	3.2	1.4	17	2.9	1.4	5	4.1	0.9
PI 482267	Zimbabwe	3.2	1.5	10	3.0	1.8	6	3.3	1.0
PI 482342	Zimbabwe	3.2	1.1	21	3.2	0.9	12	3.2	1.4
40 most susceptible PI accessions									
PI 536464	Maldives	5.8	1.6	10	5.3	1.8	6	6.5	1.0
PI 277974	Turkey	5.8	1.3	7	5.3	1.1	3	6.8	1.2
PI 512369	Spain	5.8	2.0	6	5.3	0.5	3	6.9	3.6
PI 183023	India	5.8	0.9	6	5.7	0.5	4	6.0	1.4
PI 171581	Turkey	5.8	1.2	9	5.9	1.2	2	5.3	0.6
PI 214044	India	5.8	1.0	8	5.9	1.0	2	5.4	0.5
PI 173888	India	5.8	1.4	11	5.9	1.6	5	5.4	1.0
PI 435085	China	5.8	1.1	9	5.9	0.9	5	5.4	1.5
PI 167124	Turkey	5.8	0.7	7	5.9	0.3	4	5.6	1.1
PI 357660	Yugoslavia	5.8	1.1	8	5.9	0.6	5	5.8	1.8
PI 169253	Turkey	5.8	0.7	7	6.0	0.6	4	5.5	0.8
PI 534593	Syria	5.8	1.2	8	6.0	1.2	7	5.6	1.3
PI 537465	Spain	5.8	1.0	12	6.1	1.0	4	4.8	0.4
PI 175658	Turkey	5.8	1.6	15	6.2	1.7	8	5.1	1.4
PI 176916	Turkey	5.8	1.5	12	6.3	0.6	3	3.7	2.4
PI 169285	Turkey	5.8	1.8	5	6.3	1.9	4	5.2	1.7
PI 357735	Yugoslavia	5.9	2.1	9	5.0	1.5	5	7.7	1.7
PI 536460	Maldives	5.9	1.2	11	5.5	0.8	3	7.6	0.5
PI 169237	Turkey	5.9	1.5	12	5.9	1.5	5	5.6	1.8
PI 173669	Turkey	5.9	1.4	8	5.9	1.0	5	5.9	2.1
PI 234287	Portugal	5.9	1.3	20	6.1	1.4	9	5.4	1.0
PI 174103	Turkey	5.9	1.3	9	6.7	1.2	7	4.8	0.3
PI 226459	Iran	6.0	1.8	6	5.2	1.7	3	7.6	0.5
PI 525091	Egypt	6.0	1.0	10	5.7	0.8	7	6.4	1.1
PI 525087	Egypt	6.0	0.9	10	5.9	0.7	4	6.3	1.3
PI 266028	Venezuela	6.0	1.0	8	6.0	1.1	7	6.0	1.0
PI 177320	Turkey	6.0	0.6	9	6.1	0.6	3	5.7	0.6
PI 175665	Turkey	6.0	1.2	10	6.1	1.0	3	5.7	1.8
PI 381734	India	6.0	1.4	11	6.2	1.5	4	5.4	1.3
PI 207472	Afghanistan	6.0	1.0	8	6.3	0.8	3	5.3	1.5
PI 113326	China	6.0	1.3	22	6.3	1.4	15	5.6	0.8
PI 435282	Iraq	6.0	1.7	9	6.4	1.7	4	5.3	1.5
PI 512373	Spain	6.0	1.0	18	6.4	0.9	11	5.5	0.8

Table 8 (Continued).

PI 278041	Turkey	6.1	1.6	5	5.8	0.5	4	6.6	2.5	
PI 534597 [3]	Syria	6.1	1.0	6	6.0	1.1	6	6.2	1.0	
PI 525084 [3]	Egypt	6.1	0.9	10	6.0	1.0	3	6.6	0.2	
PI 226445 [3]	Israel	6.1	1.4	11	6.6	1.3	6	5.0	0.9	
PI 223764 [3]	Afghanistan	6.2	1.0	17	6.3	1.0	13	6.2	1.1	
PI 169286 [3]	Turkey	6.3	1.1	18	6.5	0.8	15	6.0	1.3	
PI 183398 [3]	India	6.3	1.9	9	7.0	2.1	5	5.1	1.0	
Watermelon checks										
Allsweet	Univ. of Kansas	3.4	2.1	19	3.4	2.3	8	3.4	1.5	
PI 189225	Zaire	3.8	1.2	20	3.7	0.9	14	4.0	1.5	
AU-Golden Producer	Auburn Univ.	4.1	1.1	10	3.8	1.0	8	4.4	1.1	
Crimson Sweet	Univ. of Kansas	4.1	1.1	17	3.8	1.1	10	4.5	0.8	
Jubilee	Univ. of Florida	4.1	1.2	18	3.8	1.2	9	4.7	1.2	
Regency	Petoseed	4.1	1.2	20	4.1	0.9	12	4.1	1.6	
Calhoun Gray	Louisiana St. U.	4.1	1.2	19	4.5	1.2	13	3.4	1.1	
Yellow Shipper	Willhite	4.2	1.2	14	3.8	1.3	11	4.6	1.0	
AU-Jubilant	Auburn Univ.	4.2	1.5	9	4.1	1.2	9	4.3	1.8	
PI 271778	South Africa	4.2	1.4	11	4.2	0.6	6	4.4	2.3	
Fairfax	USDA-ARS	4.7	1.0	9	4.7	1.2	7	4.8	0.8	
Congo	USDA-ARS	4.7	1.7	28	4.9	1.7	17	4.5	1.7	
Sugar Baby	M. Hardin	4.8	1.2	20	5.1	1.1	8	3.9	1.1	
AU-Producer	Auburn Univ.	5.0	1.6	10	5.0	1.9	10	5.0	1.2	
Charleston Gray	USDA-ARS	5.0	1.4	41	5.4	1.5	24	4.4	1.1	
AU-Sweet Scarlet	Auburn Univ.	5.1	1.7	10	5.6	2.0	9	4.5	1.2	
Statistics (1,332 cultigens)										
LSD (5%)			0.40			0.30			0.23	
F ratio			4.00 **			3.81 **			2.37 **	
Minimum			1.50			0.90			1.10	
Maximum			6.40			7.00			7.70	

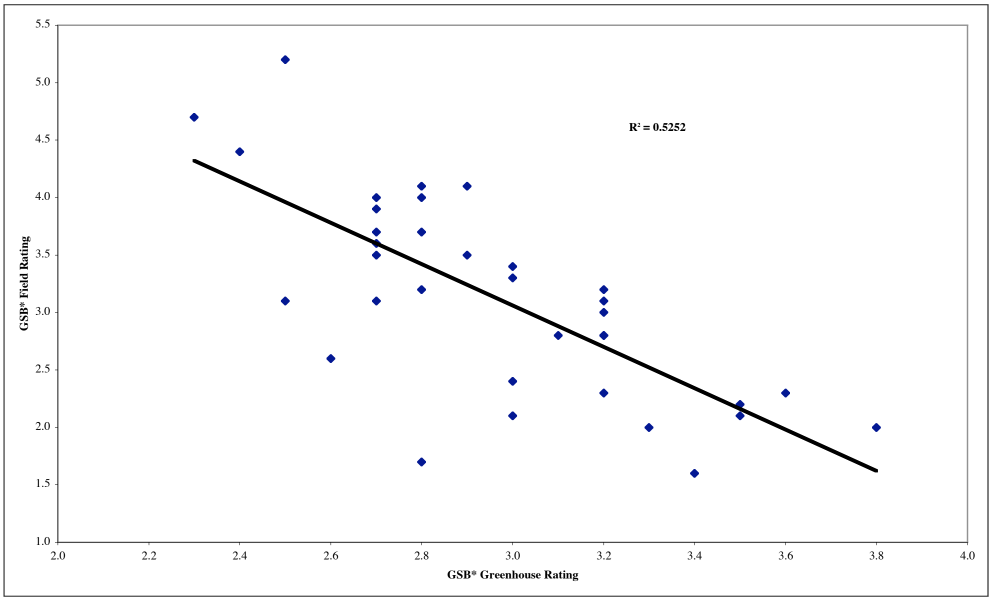
[1] Disease assessment scale adopted for screening watermelon for resistance to gummy stem blight: 0 = immune; 1 = yellowing on leaves (suspect of disease only); 2 to 4 = symptoms on leaves only; 5 = some leaves dead, no symptoms on stem,; 6 to 8 = symptoms on leaves and stems; 9 = plant dead

[2] PI accessions chosen as most resistant (low mean, low variability, and high number of replications tested), to be used in future development of resitant cultivars by backcross breeding

[3] PI accessions chosen as most susceptible (high mean, low variability, and high number of replications tested), to be used in future assays as susceptible checks

*, ** r-value significant at p-value≤0.05 or p-value≤0.01, respectively

Figure 1. Correlation between greenhouse and field average disease rating for the most resistant PI accessions evaluated for resistance to gummy stem blight.



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* GSB = gummy stem blight

Table 9. Overall and greenhouse average disease rating for the most resistant PI accessions evaluated, ranked by resistance to gummy stem blight in the greenhouse.

Cultigen identification		Gummy stem blight rating [1]					
		Overall			Greenhouse		
Name	Source	n	Y	□	n	Y	□
PI 271982	Somalia	9	3.2	1.4	2	0.9	0.3
PI 247398	Greece	9	3.2	2.0	2	1.5	4.1
PI 195771	Guatemala	10	3.2	1.7	6	2.3	1.2
PI 526233	Zimbabwe	12	2.7	1.1	10	2.4	0.8
PI 227203	Japan	10	3.2	1.8	6	2.4	1.1
PI 482276	Zimbabwe	17	2.7	1.0	11	2.5	1.1
PI 435990	China	11	3.2	1.9	8	2.5	1.7
PI 482379	Zimbabwe	15	2.6	0.9	8	2.6	0.5
PI 296337	South Africa	14	3.0	0.8	9	2.7	0.8
PI 296343	South Africa	14	3.1	1.5	8	2.7	1.0
PI 490384	Mali	12	3.1	1.4	8	2.7	1.0
PI 271770	South Africa	43	3.0	1.1	27	2.7	1.1
PI 296332	South Africa	13	2.9	1.2	7	2.7	1.4
PI 271771	South Africa	23	2.8	2.1	20	2.7	2.1
PI 512361	Spain	13	3.2	1.1	9	2.8	0.8
PI 512388	Spain	15	3.1	0.9	9	2.8	0.8
PI 279461	Japan	14	2.3	1.3	8	2.8	1.5
PI 490375	Mali	12	3.0	1.6	7	2.8	1.9
PI 319237	Japan	17	3.2	2.5	11	2.8	2.3
PI 296339	South Africa	7	2.9	1.1	1	2.9	0.0
PI 482257	Zimbabwe	18	3.1	1.5	11	2.9	1.1
PI 542123	Botswana	22	3.2	1.4	17	2.9	1.4
PI 164248	Liberia	15	2.8	2.0	8	3.0	1.1
PI 211915	Iran	31	3.1	1.7	23	3.0	1.7
PI 482267	Zimbabwe	16	3.2	1.5	10	3.0	1.8
PI 254744	Senegal	21	2.6	1.8	11	3.0	2.0
PI 512398	Spain	12	3.0	0.8	9	3.1	0.8
PI 482315	Zimbabwe	19	3.0	1.3	11	3.2	0.9
PI 482342	Zimbabwe	33	3.2	1.1	21	3.2	0.9
PI 482283	Zimbabwe	34	3.0	1.5	18	3.2	1.1
PI 542114	Botswana	14	3.1	1.3	11	3.2	1.3
PI 508443	Korea	11	3.1	1.6	7	3.2	1.5
PI 244019	South Africa	37	2.8	2.0	23	3.2	2.2
PI 241689	Chile	14	3.1	1.1	11	3.3	1.1

Table 9 (Continued).

PI 490383	Mali	18	2.9	1.5	13	3.4	1.0
PI 379243	Yugoslavia	16	2.9	1.8	10	3.5	0.9
PI 482284	Zimbabwe	26	3.0	1.6	17	3.5	1.6
PI 500312	Zambia	18	3.1	1.1	11	3.6	1.0
PI 532666	Swaziland	7	3.0	1.3	2	3.7	0.2
PI 249009	Nigeria	12	3.0	1.6	7	3.8	1.6
Statistics (1,332 cultigens)							
LSD (5%)			0.40			0.30	
F ratio			4.00 **			3.81 **	
Minimum			1.50			0.90	
Maximum			6.40			7.00	

[1] Disease assessment scale adopted for screening watermelon for resistance to gummy stem blight: 0 = immune; 1 = yellowing on leaves (suspect of disease only); 2 to 4 = symptoms on leaves only; 5 = some leaves dead, no symptoms on stem,; 6 to 8 = symptoms on leaves and stems; 9 = plant dead

*, ** r-value significant at p-value≤0.05 or p-value≤0.01, respectively

Table 10. Overall and field average disease rating for the most resistant PI accessions evaluated, ranked by resistance to gummy stem blight in the field.

Cultigen identification		Gummy stem blight rating [1]					
		Overall			Greenhouse		
Name	Source	n	Y	□	n	Y	□
PI 490383	Mali	18	2.9	1.5	5	1.6	2.0
PI 279461	Japan	14	2.3	1.3	6	1.7	0.6
PI 241689	Chile	14	3.1	1.1	3	2.0	0.2
PI 249009	Nigeria	12	3.0	1.6	5	2.0	0.8
PI 254744	Senegal	21	2.6	1.8	10	2.1	1.5
PI 379243	Yugoslavia	16	2.9	1.8	6	2.1	2.7
PI 482284	Zimbabwe	26	3.0	1.6	9	2.2	1.5
PI 500312	Zambia	18	3.1	1.1	7	2.3	0.7
PI 244019	South Africa	37	2.8	2.0	14	2.3	1.5
PI 164248	Liberia	15	2.8	2.0	7	2.4	2.7
PI 482379	Zimbabwe	15	2.6	0.9	7	2.6	1.2
PI 532666	Swaziland	7	3.0	1.3	5	2.7	1.5
PI 512398	Spain	12	3.0	0.8	3	2.8	0.7
PI 482315	Zimbabwe	19	3.0	1.3	8	2.8	1.7
PI 482283	Zimbabwe	34	3.0	1.5	16	2.8	1.9
PI 296339	South Africa	7	2.9	1.1	6	2.9	1.2
PI 508443	Korea	11	3.1	1.6	4	3.0	1.8
PI 482276	Zimbabwe	17	2.7	1.0	6	3.1	0.6
PI 296332	South Africa	13	2.9	1.2	6	3.1	0.9
PI 542114	Botswana	14	3.1	1.3	3	3.1	1.6
PI 490375	Mali	12	3.0	1.6	5	3.2	1.1
PI 482342	Zimbabwe	33	3.2	1.1	12	3.2	1.4
PI 482267	Zimbabwe	16	3.2	1.5	6	3.3	1.0
PI 211915	Iran	31	3.1	1.7	8	3.4	1.8
PI 482257	Zimbabwe	18	3.1	1.5	7	3.5	2.0
PI 296343	South Africa	14	3.1	1.5	6	3.5	2.1
PI 296337	South Africa	14	3.0	0.8	5	3.6	0.6
PI 247398	Greece	9	3.2	2.0	7	3.6	1.1
PI 271770	South Africa	43	3.0	1.1	16	3.7	0.8
PI 512388	Spain	15	3.1	0.9	6	3.7	0.8
PI 271982	Somalia	9	3.2	1.4	7	3.8	0.7
PI 490384	Mali	12	3.1	1.4	4	3.9	1.8
PI 271771	South Africa	23	2.8	2.1	3	4.0	1.2
PI 319237	Japan	17	3.2	2.5	6	4.0	2.9
PI 542123	Botswana	22	3.2	1.4	5	4.1	0.9

Table 10 (Continued).

PI 512361	Spain	13	3.2	1.1	4	4.1	1.4
PI 526233	Zimbabwe	12	2.7	1.1	2	4.2	1.1
PI 227203	Japan	10	3.2	1.8	4	4.4	2.0
PI 195771	Guatemala	10	3.2	1.7	4	4.7	1.4
PI 435990	China	11	3.2	1.9	3	5.2	0.2
Statistics (1,332 cultigens)							
LSD (5%)			0.40			0.30	
F ratio			4.00 **			3.81 **	
Minimum			1.50			0.90	
Maximum			6.40			7.00	

[1] Disease assessment scale adopted for screening watermelon for resistance to gummy stem blight: 0 = immune; 1 = yellowing on leaves (suspect of disease only); 2 to 4 = symptoms on leaves only; 5 = some leaves dead, no symptoms on stem,; 6 to 8 = symptoms on leaves and stems; 9 = plant dead

*, ** r-value significant at p-value≤0.05 or p-value≤0.01, respectively

4. CONCLUSIONS

Gummy stem blight caused by *Didymella bryoniae* showed to be highly variable in pathogenicity due to environmental factors such as relative humidity and temperatures. Therefore, repeatability over replications, years of testing, or type of assay was low in watermelon, in contrast to cucumber and melon. Testing for gummy stem blight resistance in watermelon must be repeated over many years, with multiple replications per year, and possibly adopting all cultural practices that can reduce variation of relative humidity and temperatures (overhead irrigation, choice of a uniform experimental site, and inoculation during warm and humid seasons in the field; use of a humidity chamber in the greenhouse). Since gummy stem blight resistance is desirable both at the seedling stage in transplant production greenhouses and at later growth-stages in crop production fields, selected cultigens should be highly resistant in both environments. For marketing of cultivars in drier climates (i.e. southwestern U.S.), where gummy stem blight typically appears at the seedling stage during transplant production, due to high relative humidity and warm temperatures in greenhouses, it should be sufficient to develop cultivars highly resistant in the greenhouse and moderately resistant in the field. In years of extraordinary humid weather, gummy stem blight in the field would be controlled with an integrated pest management program, while in regular year of dry weather it would not affect the crop.

In our screening of the entire available USDA-ARS germplasm collection we identified cultigens more resistant than both the adapted resistant cultivars (AU-Producer, AU-Jubilant, AU-Golden Producer, and AU–Sweet Scarlet) and the wild resistant inbred cultigens (PI 189225 and PI 271778) identified in previous screenings. Among the group of selected resistant cultigens, germplasm from different regions of the world is available: future inheritance and allelism study will answer the question of the presence of multiple genes for resistance to gummy stem blight in watermelon versus the hypothesis of multiple alleles at the same locus. A mixed model of multi-allelic multiple loci is also possible.

The development of resistant inbreds and adapted cultivars, depending on the results of allelism and inheritance studies, would be based on recurrent selection or backcross breeding program. Should the hypothesis of multiple alleles at the same locus be confirmed, recurrent selection will be the wrong breeding method, while backcross or pedigree breeding would be a more successful technique, because it will allow pyramiding of two (three for triploid watermelons) different alleles in the final hybrid. Breeding triploid watermelons will allow pyramiding different alleles in the same genome: a hybrid with a a_1a_2 locus can be used to produce a tetraploid ($a_1a_2a_1a_2$). The tetraploid can be crossed with a homozygous a_3a_3 diploid. The resulting triploid individuals will have a genome including all three alleles $a_1a_2a_3$ for gummy stem blight resistance. Of course, the final bulk of triploid seeds also will include also individuals with genes $a_1a_1a_3$ or $a_2a_2a_3$ which might be less resistant then the $a_1a_2a_3$ individuals. The most challenging aspect of such a breeding program would be the selection of the 0.5 a_1a_2 progenies of the $Aa_1 \times a_2a_2$ cross, unless resistance is much greater in the a_1a_2 than in the a_1a_1 progenies. Greater help could arise by molecular assisted selection. Therefore, the development of reliable molecular markers for gummy stem blight resistance is a key-point for future research.

Our study provides a list of 40 resistant cultigens to be employed in the recurrent selection programs to obtain resistance both in the field and the greenhouse, even though high levels of resistance in both environments might be very difficult to gain, because of the negative correlation between the two traits. The goal of such a breeding effort should be moderate resistance in both environments, maybe higher in the greenhouse for geogaphic areas with dry weather. Integrated pest management programs would help to control unusual outbreaks of gummy stem blight in the field in these areas. We believe this to be a feasible expectation, because the overall resistance of the selected PI accessions is greater than the adapted and wild germplasm available prior to our comprehensive screening.

We also provide two separated rankings of the resistant cultigens, where the most resistant might be used in backcross or pedigree breeding programs for release of adapted cultivars with high resistance either in the greenhouse at the juvenile stage or in the field at the adult stage.

Future efforts in research of resistance to gummy stem blight in watermelon should focus on the identification of reliable molecular markers, as discussed above, and on the understanding of the inheritance of both mechanisms of resistance in a wide number of resistant PI accessions.

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6. APPENDIX

Table 11. Overall, field, and greenhouse average disease rating for 1,274 PI accessions, and checks (cultivars and PI accessions, watermelon and cucumbers) evaluated for resistance to gummy stem blight.

		Gummy stem blight rating[1]							
Cultigen identification		Overall		Greenhouse			Field		
Name	Source	Y	□	n	Y	□	n	Y	□
Grif 12335	China	4.0	1.2	13	4.3	1.2	5	3.2	1.1
Grif 12336	China	3.8	0.8	11	3.9	1.0	6	3.6	0.5
Grif 1728	China	3.9	1.3	13	3.9	1.4	4	4.1	1.2
Grif 1729	China	4.6	1.7	6	4.7	2.3	5	4.5	0.6
Grif 1730	China	4.0	1.2	10	3.8	1.4	6	4.3	0.6
Grif 1731	China	3.9	1.9	8	4.7	1.8	4	2.4	0.4
Grif 1732	China	4.0	1.8	12	3.7	2.1	10	4.4	1.5
Grif 1733	China	3.8	1.5	11	3.6	1.6	3	4.6	0.8
Grif 1734	China	4.1	0.9	11	3.8	0.6	7	4.7	1.1
Grif 5596	India	4.1	1.2	7	3.6	1.0	5	4.8	1.0
Grif 5597	India	4.7	1.4	9	4.9	1.5	5	4.3	1.2
Grif 5598	India	3.8	1.5	10	4.1	1.6	7	3.4	1.4
Grif 5599	India	4.4	0.9	8	4.6	0.8	5	4.1	1.0
Grif 5600	India	5.1	1.2	9	5.2	1.5	6	4.9	0.5
PI 105445	Turkey	5.2	0.9	10	5.5	1.0	4	4.7	0.3
PI 113326	China	6.0	1.3	22	6.3	1.4	15	5.6	0.8
PI 161373	Korea	4.9	1.2	11	4.5	1.0	7	5.7	1.2
PI 162667	Argentina	4.2	1.1	10	4.2	0.8	5	4.3	1.8
PI 163202	India	5.1	1.2	8	5.2	1.4	5	4.8	1.0
PI 163203	India	4.4	1.8	8	3.7	1.6	5	5.6	1.5
PI 163204	India	5.1	0.9	10	5.4	0.8	7	4.7	1.0
PI 163205	India	5.4	1.0	8	5.7	0.9	4	4.7	1.1
PI 163572	Guatemala	4.8	1.5	8	4.4	1.8	6	5.4	0.9
PI 163574	Guatemala	4.7	1.6	9	5.2	1.0	6	4.1	2.2
PI 164146	India	4.9	1.6	12	5.2	1.5	3	4.0	1.9
PI 164247	Nigeria	5.4	1.2	14	5.3	1.5	16	5.4	0.9
PI 164248	Liberia	2.8	2.0	8	3.0	1.1	7	2.4	2.7
PI 164474	India	5.0	1.2	6	4.5	0.9	5	5.7	1.3
PI 164539	India	4.7	1.1	26	4.5	0.9	13	5.1	1.4

Table 11 (Continued).

PI 164543	India	5.1	1.0	7	4.8	1.2	5	5.6	0.3
PI 164550	India	5.1	1.3	9	4.9	1.6	6	5.5	0.6
PI 164570	India	5.7	1.7	6	5.1	1.4	5	6.4	1.9
PI 164633	India	5.1	1.1	11	5.1	1.0	2	5.2	1.9
PI 164634	India	5.1	1.6	9	4.9	1.3	4	5.5	2.2
PI 164636	India	4.8	1.9	8	4.7	1.5	2	5.5	3.6
PI 164639	India	4.5	1.6	9	4.3	1.6	2	5.5	1.0
PI 164655	India	5.3	1.6	7	4.2	1.2	6	6.5	1.0
PI 164665	India	4.9	1.4	22	5.3	1.4	11	4.1	1.0
PI 164685	India	4.8	1.4	8	4.1	1.4	6	5.7	0.9
PI 164687	India	5.6	1.0	12	5.9	0.8	7	5.2	1.3
PI 164708	India	4.4	1.2	11	4.5	1.2	4	4.0	1.4
PI 164709	India	4.9	1.2	12	5.0	1.2	5	4.5	1.2
PI 164737	India	4.9	1.3	17	5.1	1.2	7	4.5	1.6
PI 164748	India	4.7	1.9	3	3.3	1.7	5	5.5	1.6
PI 164804	India	5.2	1.0	10	5.5	0.9	7	4.8	1.0
PI 164977	Turkey	5.0	1.2	6	4.5	0.9	4	5.6	1.5
PI 164992	Turkey	5.4	1.5	8	5.6	1.6	5	5.2	1.5
PI 164998	Turkey	5.5	1.0	8	5.1	0.7	4	6.4	1.1
PI 165002	Turkey	4.7	1.7	13	4.0	1.3	5	6.5	0.9
PI 165024	Turkey	4.3	1.5	12	3.9	1.5	5	5.4	0.9
PI 165448	Mexico	5.3	1.0	11	5.5	1.0	4	4.8	0.8
PI 165451	Mexico	5.0	1.1	12	5.3	0.8	8	4.6	1.5
PI 165523	India	5.1	1.1	22	5.0	0.8	8	5.2	1.8
PI 166993	Turkey	5.2	1.3	10	5.4	1.3	6	4.9	1.5
PI 167026	Turkey	4.1	1.4	6	3.7	1.6	4	4.7	1.1
PI 167045	Turkey	4.9	1.3	7	4.8	1.6	4	5.1	0.7
PI 167059	Turkey	5.2	0.8	8	5.2	0.7	4	5.2	1.2
PI 167124	Turkey	5.8	0.7	7	5.9	0.3	4	5.6	1.1
PI 167125	Turkey	4.9	0.9	10	5.1	0.8	6	4.7	1.0
PI 167126	Turkey	4.9	1.5	7	4.5	1.2	4	5.7	1.8
PI 167219	Turkey	4.2	0.9	11	4.2	1.0	7	4.4	0.9
PI 167222	Turkey	4.8	1.6	11	4.8	1.5	5	4.6	2.1
PI 169232	Turkey	4.6	1.6	18	5.1	1.6	12	3.9	1.4
PI 169233	Turkey	4.7	1.3	8	4.6	1.4	5	5.0	1.1
PI 169234	Turkey	4.6	1.3	12	4.4	1.2	4	5.0	1.6
PI 169235	Turkey	5.4	1.1	5	5.7	1.1	6	5.2	1.2
PI 169236	Turkey	4.6	1.4	11	5.0	1.1	5	3.6	1.6
PI 169237	Turkey	5.9	1.5	12	5.9	1.5	5	5.6	1.8
PI 169238	Turkey	3.8	1.4	6	3.4	1.5	3	4.7	0.3
PI 169239	Turkey	5.1	1.0	12	5.2	1.1	5	4.8	0.8
PI 169240	Turkey	5.1	1.6	4	4.4	0.6	4	5.9	2.0

Table 11 (Continued).

PI 169241	Turkey	5.6	1.2	8	5.8	0.8	2	4.6	2.5
PI 169242	Turkey	5.0	1.4	18	4.8	1.4	15	5.2	1.4
PI 169243	Turkey	5.5	1.0	12	5.6	0.9	6	5.3	1.3
PI 169244	Turkey	5.3	1.0	7	5.3	0.9	2	5.3	1.5
PI 169245	Turkey	5.4	1.3	7	5.3	0.7	5	5.5	2.0
PI 169246	Turkey	5.2	0.8	9	5.1	1.0	6	5.3	0.7
PI 169247	Turkey	4.9	1.3	9	4.5	1.2	3	6.3	0.4
PI 169248	Turkey	4.3	0.9	5	4.5	0.9	4	4.1	0.9
PI 169249	Turkey	4.7	1.7	8	4.5	1.5	4	4.9	2.2
PI 169250	Turkey	4.9	1.2	22	4.7	1.1	11	5.2	1.5
PI 169251	Turkey	4.9	1.7	7	4.5	1.7	5	5.3	1.8
PI 169252	Turkey	5.0	1.5	10	5.4	1.7	5	4.2	0.6
PI 169253	Turkey	5.8	0.7	7	6.0	0.6	4	5.5	0.8
PI 169254	Turkey	4.0	0.9	11	4.0	1.0	4	4.0	0.6
PI 169255	Turkey	4.7	1.1	8	4.9	1.2	5	4.3	0.7
PI 169256	Turkey	4.5	1.7	4	3.9	1.8	5	5.0	1.6
PI 169257	Turkey	5.3	1.2	4	5.0	1.5	3	5.6	1.0
PI 169258	Turkey	5.2	1.4	7	5.2	1.6	2	5.5	0.5
PI 169259	Turkey	5.0	1.1	5	5.0	1.4	4	5.0	0.6
PI 169260	Turkey	5.1	1.2	10	5.1	0.7	7	5.1	1.8
PI 169261	Turkey	5.4	1.9	23	5.7	1.8	8	4.5	2.0
PI 169262	Turkey	5.0	1.1	10	5.0	1.0	4	5.1	1.4
PI 169263	Turkey	5.5	1.4	11	6.1	0.8	4	3.8	1.1
PI 169264	Turkey	4.8	1.9	11	5.2	2.1	4	3.8	1.0
PI 169265	Turkey	4.4	1.5	8	3.7	1.2	5	5.5	1.3
PI 169266	Turkey	5.2	1.4	6	5.7	1.5	4	4.5	0.8
PI 169267	Turkey	5.0	1.3	11	5.1	1.2	4	4.6	1.7
PI 169268	Turkey	4.7	1.2	5	4.4	1.8	7	5.0	0.6
PI 169269	Turkey	5.4	1.2	6	5.1	1.2	5	5.7	1.1
PI 169270	Turkey	4.8	1.0	8	4.6	1.1	6	5.1	0.8
PI 169271	Turkey	4.9	0.9	9	4.5	0.9	6	5.4	0.5
PI 169272	Turkey	5.2	2.3	12	5.6	2.5	5	4.3	1.9
PI 169273	Turkey	5.1	1.7	12	5.4	1.8	4	4.3	1.0
PI 169274	Turkey	4.2	1.3	9	4.5	0.9	6	3.7	1.7
PI 169275	Turkey	5.4	0.9	4	5.1	0.9	3	5.8	0.8
PI 169276	Turkey	4.3	1.2	9	4.4	1.1	4	4.0	1.6
PI 169277	Turkey	5.7	1.0	18	5.6	1.0	7	6.0	1.1
PI 169278	Turkey	4.3	1.8	7	4.6	1.1	5	3.8	2.5
PI 169279	Turkey	4.4	1.6	8	4.0	1.5	6	5.1	1.6
PI 169280	Turkey	4.7	1.1	11	5.0	1.0	5	4.0	1.2
PI 169281	Turkey	5.5	1.2	8	5.9	1.2	5	4.8	1.1
PI 169282	Turkey	4.8	1.7	9	5.4	1.0	6	3.8	2.2

Table 11 (Continued).

PI 169283	Turkey	3.8	1.2	7	3.6	1.4	3	4.4	0.7
PI 169284	Turkey	4.3	1.1	6	4.1	1.3	3	4.7	0.7
PI 169285	Turkey	5.8	1.8	5	6.3	1.8	4	5.2	1.7
PI 169286	Turkey	6.3	1.1	18	6.5	0.8	15	6.0	1.3
PI 169287	Turkey	5.6	0.9	11	5.6	1.0	1	6.0	0.0
PI 169288	Turkey	4.3	1.7	6	4.1	1.2	4	4.5	2.4
PI 169289	Turkey	4.4	1.6	5	5.5	0.5	4	3.0	1.4
PI 169290	Turkey	4.6	1.5	10	4.7	1.8	8	4.5	1.3
PI 169291	Turkey	5.2	1.5	8	5.8	1.2	5	4.2	1.7
PI 169292	Turkey	4.5	1.6	9	4.7	1.5	5	4.2	1.9
PI 169293	Turkey	5.4	1.8	10	5.9	1.6	3	4.0	2.0
PI 169295	Turkey	5.6	1.5	11	5.8	1.5	3	4.5	1.0
PI 169296	Turkey	5.2	0.9	7	5.4	0.4	6	5.0	1.2
PI 169297	Turkey	4.5	1.1	11	4.7	1.1	3	3.8	1.2
PI 169299	Turkey	4.7	1.3	3	4.9	0.3	4	4.6	1.8
PI 169300	Turkey	5.4	1.1	10	5.4	1.2	6	5.3	1.0
PI 171392	South Africa	3.7	0.6	12	3.5	0.7	8	4.1	0.4
PI 171579	Turkey	5.1	1.7	23	5.0	1.7	6	5.2	1.7
PI 171580	Turkey	4.9	1.3	11	4.8	1.2	3	5.3	1.9
PI 171581	Turkey	5.8	1.2	9	5.9	1.2	2	5.3	0.6
PI 171582	Turkey	4.5	1.6	10	4.4	1.8	5	4.6	1.3
PI 171583	Turkey	5.6	1.1	8	5.8	1.2	3	5.2	0.7
PI 171584	Turkey	5.1	1.1	11	5.0	1.2	3	5.7	0.3
PI 171585	Turkey	5.1	1.2	10	5.0	1.2	4	5.5	1.3
PI 171586	Turkey	4.9	1.7	10	4.7	2.1	6	5.4	0.7
PI 171587	Turkey	5.4	2.4	6	5.0	2.4	3	6.0	2.9
PI 172786	Turkey	5.0	1.4	9	5.2	0.8	6	4.7	2.0
PI 172787	Turkey	4.4	1.4	7	3.9	1.5	6	5.0	1.2
PI 172788	Turkey	4.9	0.8	5	4.7	0.7	5	5.0	0.9
PI 172789	Turkey	4.5	1.5	10	5.2	1.0	4	2.8	0.6
PI 172790	Turkey	4.6	1.0	8	4.5	1.2	6	4.7	0.9
PI 172791	Turkey	4.7	1.0	9	4.9	1.1	3	4.1	0.6
PI 172792	Turkey	4.8	1.1	6	4.5	1.1	5	5.2	0.9
PI 172793	Turkey	5.3	2.0	6	5.5	1.2	2	4.7	4.4
PI 172794	Turkey	5.4	1.7	8	5.8	1.7	3	4.3	1.2
PI 172795	Turkey	4.9	1.4	22	4.9	1.6	8	5.0	0.7
PI 172796	Turkey	4.6	1.2	7	4.5	1.3	5	4.7	1.2
PI 172797	Turkey	5.0	2.0	8	4.7	1.8	3	5.7	2.7
PI 172798	Turkey	4.9	1.5	21	5.1	1.5	5	4.1	0.9
PI 172799	Turkey	5.6	1.1	8	5.3	0.9	2	6.9	1.3
PI 172800	Turkey	4.0	1.0	5	4.0	1.2	5	4.1	0.9
PI 172801	Turkey	4.9	1.3	9	5.1	1.7	6	4.7	0.7

Table 11 (Continued).

PI 172802	Turkey	4.3	1.3	24	4.5	1.0	8	3.8	1.8
PI 172803	Turkey	5.0	1.2	8	4.9	1.4	3	5.3	0.6
PI 172804	Turkey	3.4	2.1	10	2.5	2.1	5	5.1	0.8
PI 172805	Turkey	5.0	1.3	8	4.9	1.5	2	5.5	0.7
PI 173668	Turkey	5.0	1.5	7	4.7	1.4	3	5.7	1.5
PI 173669	Turkey	5.9	1.4	8	5.9	1.0	5	5.9	2.1
PI 173670	Turkey	5.0	1.1	20	5.3	0.9	8	4.3	1.4
PI 173888	India	5.8	1.4	11	5.9	1.6	5	5.4	1.0
PI 174098	Turkey	4.0	1.1	9	3.8	1.3	4	4.5	0.4
PI 174099	Turkey	5.7	1.3	10	5.9	1.5	5	5.4	0.7
PI 174100	Turkey	4.9	1.8	9	4.9	1.7	4	4.9	2.4
PI 174101	Turkey	4.6	2.2	5	4.5	1.0	4	4.6	3.4
PI 174103	Turkey	5.9	1.3	9	6.7	1.2	7	4.8	0.3
PI 174104	Turkey	5.4	1.4	17	5.4	1.6	11	5.2	1.3
PI 174105	Turkey	4.3	1.2	10	4.3	1.2	3	4.0	1.1
PI 174106	Turkey	4.1	2.0	7	3.5	2.2	4	5.2	0.7
PI 174107	Turkey	4.7	1.2	23	5.2	0.7	12	3.8	1.4
PI 174108	Turkey	4.9	0.9	9	5.0	0.9	5	4.9	1.1
PI 174109	Turkey	4.6	1.1	13	4.4	1.1	4	5.3	0.9
PI 175102	India	5.0	0.8	9	5.1	0.9	4	4.7	0.5
PI 175650	Turkey	5.3	0.5	10	5.3	0.5	1	5.7	0.0
PI 175651	Turkey	4.8	1.5	10	4.9	1.4	6	4.6	1.8
PI 175652	Turkey	4.8	1.3	6	4.8	1.4	5	4.8	1.2
PI 175653	Turkey	4.5	1.3	6	4.2	1.3	4	5.1	1.3
PI 175654	Turkey	4.4	0.8	6	4.7	0.9	3	3.9	0.4
PI 175655	Turkey	5.0	1.6	6	4.6	1.5	5	5.4	1.7
PI 175656	Turkey	4.6	0.7	9	4.4	0.7	6	5.0	0.7
PI 175657	Turkey	4.4	1.2	14	4.5	0.9	9	4.3	1.7
PI 175658	Turkey	5.8	1.6	15	6.2	1.7	8	5.1	1.3
PI 175660	Turkey	4.4	0.6	4	4.5	0.1	4	4.4	1.0
PI 175661	Turkey	4.8	1.5	10	4.9	1.2	4	4.6	2.4
PI 175662	Turkey	5.7	1.4	5	4.9	1.2	7	6.3	1.2
PI 175663	Turkey	5.3	1.2	11	5.3	1.2	4	5.3	1.1
PI 175664	Turkey	5.1	1.8	8	4.4	1.4	5	6.2	2.1
PI 175665	Turkey	6.0	1.2	10	6.1	1.0	3	5.7	1.8
PI 176485	Turkey	5.1	1.2	5	4.9	1.2	4	5.5	1.3
PI 176486	Turkey	4.6	0.9	6	4.4	0.4	7	4.8	1.2
PI 176487	Turkey	5.3	1.0	9	5.1	1.0	5	5.8	0.7
PI 176488	Turkey	3.6	1.8	5	3.1	2.3	4	4.1	1.3
PI 176489	Turkey	3.5	1.8	9	3.2	1.8	2	5.0	0.0
PI 176490	Turkey	4.6	1.8	8	4.5	2.1	2	4.7	0.6
PI 176491	Turkey	5.6	1.2	9	5.4	1.2	6	6.1	1.2

Table 11 (Continued).

PI 176492	Turkey	5.3	1.1	4	5.4	0.8	3	5.3	1.5
PI 176493	Turkey	5.1	1.3	8	5.9	0.5	6	4.2	1.4
PI 176494	Turkey	5.3	1.4	8	5.9	1.3	6	4.3	1.1
PI 176495	Turkey	5.7	0.9	3	6.0	0.1	4	5.5	1.1
PI 176496	Turkey	4.5	1.2	19	4.3	1.2	10	4.8	1.2
PI 176497	Turkey	4.7	1.0	6	4.7	0.9	6	4.7	1.1
PI 176498	Turkey	4.3	1.0	7	4.4	1.0	3	3.9	1.2
PI 176499	Turkey	5.5	1.3	8	5.7	1.6	5	5.1	0.5
PI 176905	Turkey	4.3	1.5	17	4.4	1.4	5	3.6	1.6
PI 176906	Turkey	5.0	1.3	7	4.7	1.3	5	5.4	1.3
PI 176907	Turkey	4.3	2.1	3	3.3	2.7	4	5.0	1.6
PI 176908	Turkey	5.1	1.2	7	4.9	1.2	5	5.3	1.3
PI 176909	Turkey	5.2	0.8	6	5.3	0.8	5	5.1	0.8
PI 176910	Turkey	5.0	0.9	9	5.0	0.9	3	5.1	0.9
PI 176911	Turkey	5.2	1.6	6	5.0	1.3	4	5.6	2.2
PI 176912	Turkey	4.6	1.3	4	3.9	1.8	5	5.1	0.6
PI 176913	Turkey	5.1	1.3	7	5.8	1.3	6	4.3	0.7
PI 176914	Turkey	4.7	1.1	11	4.7	1.3	6	4.8	0.6
PI 176915	Turkey	4.9	1.2	11	4.8	1.4	10	5.1	1.1
PI 176916	Turkey	5.8	1.5	12	6.3	0.6	3	3.7	2.4
PI 176917	Turkey	4.2	1.5	9	4.6	1.6	5	3.5	1.0
PI 176919	Turkey	4.2	1.4	9	4.8	0.9	5	3.0	1.4
PI 176921	Turkey	4.1	1.2	10	3.8	1.3	5	4.8	0.8
PI 176922	Turkey	5.5	1.1	10	6.1	0.4	5	4.4	1.2
PI 176923	Turkey	4.8	1.4	13	4.8	1.3	6	4.8	1.6
PI 177319	Turkey	4.6	2.1	8	5.2	1.0	7	4.0	2.8
PI 177320	Turkey	6.0	0.6	9	6.1	0.6	3	5.7	0.6
PI 177321	Turkey	4.6	1.8	19	4.8	1.8	8	4.3	1.6
PI 177322	Turkey	4.6	1.2	22	4.4	1.0	10	5.0	1.7
PI 177323	Turkey	4.6	1.8	17	5.0	1.8	11	4.0	1.7
PI 177324	Turkey	4.8	1.6	7	4.7	1.8	2	5.4	0.5
PI 177325	Turkey	5.3	1.5	11	5.5	1.5	2	3.9	0.4
PI 177326	Turkey	5.1	1.5	6	4.9	1.4	5	5.4	1.7
PI 177327	Turkey	5.6	1.1	18	5.3	1.1	11	6.1	1.1
PI 177328	Turkey	5.2	1.2	7	5.4	1.3	3	4.7	1.0
PI 177329	Turkey	5.5	1.0	12	5.2	0.8	6	6.2	1.1
PI 177330	Syria	5.6	0.8	3	6.1	0.4	6	5.4	0.9
PI 177331	Israel	5.1	1.4	20	5.5	1.1	3	2.7	0.9
PI 178870	Turkey	4.4	1.2	18	4.4	1.4	15	4.4	0.9
PI 178871	Turkey	4.6	1.2	9	5.3	1.0	7	3.7	1.0
PI 178872	Turkey	5.1	0.8	11	5.0	0.9	6	5.3	0.6
PI 178873	Turkey	4.7	1.1	10	4.6	1.3	6	4.7	0.9

Table 11 (Continued).

PI 178874	Turkey	3.9	1.8	10	3.3	1.5	5	5.0	1.9
PI 178876	Turkey	5.5	1.0	7	5.9	1.0	7	5.2	0.9
PI 178877	Turkey	5.6	0.7	11	5.8	0.7	5	5.1	0.2
PI 179232	Turkey	5.3	1.0	9	5.7	0.6	8	5.0	1.2
PI 179233	Turkey	5.0	0.9	8	5.1	1.0	5	4.8	0.8
PI 179234	Turkey	4.9	1.5	8	4.1	1.5	7	5.9	0.7
PI 179235	Turkey	4.5	1.2	12	4.4	1.3	4	4.5	0.3
PI 179236	Turkey	4.9	0.9	10	4.8	0.8	3	5.1	1.1
PI 179238	Turkey	4.7	1.4	7	4.5	1.4	3	5.1	1.7
PI 179239	Turkey	4.2	1.5	6	4.1	1.6	5	4.4	1.5
PI 179241	Iraq	4.7	1.1	7	5.2	0.8	4	3.7	0.9
PI 179242	Iraq	4.3	1.3	9	4.1	1.3	3	4.8	1.4
PI 179243	Turkey	4.7	1.3	6	4.1	1.4	5	5.3	1.1
PI 179661	India	4.8	1.0	8	4.9	1.2	3	4.7	0.4
PI 179662	India	3.9	1.4	26	4.0	1.4	7	3.7	1.4
PI 179876	India	4.7	0.8	10	4.5	0.9	4	5.1	0.5
PI 179877	India	4.8	1.8	5	5.8	1.9	5	3.8	1.2
PI 179878	India	4.4	1.5	10	3.8	1.3	5	5.5	1.2
PI 179879	India	5.2	1.1	11	5.3	1.3	8	5.1	1.0
PI 179880	India	4.5	1.7	7	3.5	0.4	4	6.3	1.6
PI 179881	India	5.0	1.3	11	4.9	1.2	1	6.4	0.0
PI 179882	India	4.9	0.9	9	4.6	0.6	4	5.5	1.2
PI 179883	India	4.6	1.1	8	4.6	1.5	8	4.7	0.7
PI 179884	India	4.8	0.9	11	4.6	1.0	5	5.1	0.8
PI 179885	India	5.7	1.0	12	6.2	0.7	5	4.7	0.8
PI 179886	India	5.7	1.3	8	5.2	1.5	7	6.2	0.8
PI 180276	India	4.3	1.1	11	4.1	1.3	8	4.6	0.7
PI 180277	India	5.1	1.0	12	5.0	1.0	6	5.4	0.9
PI 180278	India	5.5	1.2	10	5.7	1.1	2	4.7	1.5
PI 180426	India	5.5	1.3	13	5.6	1.0	6	5.2	2.0
PI 180427	India	3.7	1.2	9	3.2	1.0	6	4.5	1.1
PI 181740	Lebanon	4.9	1.5	10	4.6	1.6	6	5.4	1.1
PI 181741	Lebanon	4.9	1.1	20	4.6	0.8	12	5.3	1.4
PI 181742	Lebanon	4.6	1.3	10	4.3	1.4	5	5.2	1.1
PI 181743	Lebanon	5.0	1.7	9	5.1	1.6	5	4.8	2.1
PI 181744	Lebanon	4.3	1.8	5	4.5	1.6	5	4.2	2.1
PI 181868	Syria	4.8	0.9	21	4.8	0.9	5	4.8	1.2
PI 181935	Syria	5.2	1.4	5	4.4	1.7	6	6.0	0.5
PI 181936	Syria	4.5	1.7	12	5.4	1.3	7	2.9	1.0
PI 181937	Syria	4.4	1.3	5	4.3	1.4	5	4.5	1.2
PI 181938	Syria	5.0	1.3	12	5.7	0.8	5	3.3	0.2
PI 182175	Turkey	5.5	1.2	22	5.7	1.2	7	4.7	1.1

Table 11 (Continued).

PI 182176	Turkey	5.1	1.9	9	4.8	2.2	5	5.7	1.2
PI 182178	Turkey	3.4	1.5	12	3.4	1.6	3	3.5	0.1
PI 182179	Turkey	4.9	1.4	5	4.3	1.4	3	6.0	0.3
PI 182180	Turkey	5.3	1.6	7	5.6	1.4	4	4.7	1.9
PI 182181	Turkey	5.0	1.0	11	5.0	1.1	8	5.0	1.0
PI 182183	Turkey	4.1	2.1	7	3.0	1.0	3	6.6	2.0
PI 182932	India	4.0	1.4	18	4.1	1.5	10	3.9	1.2
PI 182933	India	5.1	1.7	10	4.9	1.8	3	5.9	1.6
PI 182934	India	4.9	1.6	15	4.7	1.6	10	5.1	1.5
PI 182935	India	4.9	1.0	12	4.9	0.8	5	4.9	1.5
PI 183022	India	4.6	1.5	20	4.3	1.5	9	5.2	1.4
PI 183023	India	5.8	0.9	6	5.7	0.5	4	6.0	1.4
PI 183123	India	5.1	1.2	9	4.9	1.4	7	5.4	0.9
PI 183124	India	5.5	1.6	10	5.6	1.4	6	5.4	2.2
PI 183125	India	4.5	1.4	3	3.6	2.1	5	5.0	0.6
PI 183126	India	4.8	1.2	10	5.2	1.1	4	3.8	0.8
PI 183217	Egypt	4.6	1.1	17	4.5	1.1	5	4.6	0.9
PI 183218	Egypt	4.3	1.8	6	4.6	2.0	2	3.2	0.5
PI 183299	India	4.9	1.8	8	5.6	1.7	6	3.8	1.6
PI 183300	India	4.7	1.4	17	4.5	1.3	8	5.2	1.8
PI 183398	India	6.3	1.9	9	7.0	2.1	5	5.1	1.0
PI 183399	India	4.5	1.2	7	4.2	1.3	6	4.9	1.1
PI 183673	Turkey	4.6	0.8	7	4.6	1.0	3	4.6	0.3
PI 184800	Nigeria	4.4	1.1	8	4.1	1.0	4	5.0	0.9
PI 185030	Turkey	5.3	1.1	8	5.6	1.1	5	4.7	1.0
PI 185635	Ghana	3.5	1.8	15	3.6	1.9	13	3.4	1.8
PI 185636	Ghana	3.4	0.8	2	2.9	1.5	5	3.6	0.6
PI 186490	Nigeria	4.1	1.8	10	3.6	1.3	5	5.1	2.5
PI 186975	Ghana	4.3	1.0	12	4.4	1.0	5	4.0	1.1
PI 188808	Philippines	4.6	1.2	5	4.6	0.8	4	4.6	1.8
PI 189225	Zimbabwe	3.8	1.2	20	3.7	0.9	14	4.0	1.5
PI 189316	Nigeria	5.1	1.4	11	5.4	1.3	5	4.3	1.2
PI 189317	Zaire	3.8	2.0	6	3.7	2.4	4	4.0	1.5
PI 190050	Yugoslavia	4.3	0.9	10	4.2	0.9	6	4.4	1.0
PI 192937	China	4.2	1.4	11	3.5	0.8	6	5.4	1.6
PI 192938	China	4.0	1.0	11	3.8	1.2	6	4.3	0.5
PI 193490	Ethiopia	3.9	1.3	5	4.5	1.0	4	3.1	1.2
PI 193963	Ethiopia	5.0	1.1	9	5.5	0.9	5	4.2	1.0
PI 193964	Ethiopia	4.7	1.5	10	5.2	1.5	5	3.6	0.9
PI 193965	Ethiopia	4.1	1.3	12	3.7	1.1	3	5.7	0.9
PI 195562	Ethiopia	4.6	1.3	10	4.8	1.4	4	4.3	1.1
PI 195771	Guatemala	3.2	1.7	6	2.3	1.2	4	4.7	1.4

Table 11 (Continued).

PI 195928	Ethiopia	4.6	2.1	9	5.4	2.1	5	3.3	1.2
PI 200732	ElSalvadr	4.3	1.3	8	4.3	1.5	5	4.2	0.9
PI 200733	Guatemala	4.1	1.3	17	4.2	1.4	5	4.0	1.1
PI 203551	United States	4.2	0.8	11	4.3	0.9	5	4.1	0.9
PI 204689	Turkey	3.4	2.0	8	3.4	2.0	5	3.5	2.2
PI 207471	Afghanistan	4.5	2.7	12	4.7	3.1	6	4.2	2.1
PI 207472	Afghanistan	6.0	1.0	8	6.3	0.8	3	5.3	1.5
PI 207473	Afghanistan	4.9	1.2	20	5.1	1.3	10	4.7	1.2
PI 208740	Cuba	4.3	1.3	4	4.8	1.1	5	3.9	1.4
PI 210017	India	4.0	1.2	19	3.8	1.1	6	4.6	1.3
PI 211849	Iran	5.3	1.5	9	5.5	1.7	4	4.9	1.2
PI 211850	Iran	4.7	1.3	20	4.5	1.4	7	5.3	1.1
PI 211851	Iran	4.5	1.7	11	4.6	1.8	2	3.8	1.3
PI 211852	Iran	5.5	2.0	8	5.1	1.9	5	6.1	2.2
PI 211915	Iran	3.1	1.7	23	3.0	1.7	8	3.4	1.8
PI 211917	Iran	4.5	1.5	6	4.5	1.8	2	4.8	0.3
PI 212208	Greece	5.2	0.9	8	4.8	0.6	7	5.6	1.1
PI 212209	Greece	5.2	1.7	19	5.3	1.7	3	4.9	1.4
PI 212983	India	5.6	1.0	12	5.4	0.9	5	6.3	0.9
PI 214044	India	5.8	1.0	8	5.9	1.0	2	5.4	0.5
PI 214316	India	4.9	1.4	4	3.9	1.3	6	5.6	1.0
PI 216029	India	5.0	1.1	9	5.2	1.1	4	4.6	1.3
PI 217937	Pakistan	4.7	1.1	21	4.4	0.7	9	5.3	1.6
PI 217939	Pakistan	4.2	1.6	5	4.3	1.8	2	4.2	1.4
PI 219691	Pakistan	4.6	1.3	10	5.0	1.4	5	3.9	0.8
PI 219906	Afghanistan	3.9	1.4	6	3.9	1.8	4	4.0	0.6
PI 219907	Afghanistan	5.4	1.5	16	5.6	1.6	7	4.9	1.3
PI 220779	Afghanistan	4.4	1.0	10	4.2	1.2	4	4.7	0.3
PI 222137	Algeria	5.2	1.3	20	5.2	1.4	14	5.2	1.1
PI 222184	Afghanistan	5.2	0.9	3	4.6	0.1	6	5.5	0.9
PI 222710	Iran	5.5	1.7	6	4.8	1.4	5	6.4	1.7
PI 222711	Iran	4.9	0.8	9	5.0	0.7	2	4.3	1.2
PI 222713	Iran	4.5	1.1	8	4.1	0.8	3	5.7	0.6
PI 222714	Iran	5.4	1.4	10	5.5	1.5	3	4.9	0.9
PI 222715	Iran	5.0	1.3	18	4.8	1.4	5	5.4	0.9
PI 222775	Iran	5.7	1.1	21	5.8	1.0	8	5.5	1.5
PI 222776	Iran	4.7	1.1	10	4.5	1.2	4	5.3	0.6
PI 222778	Iran	5.0	0.9	7	4.7	0.9	5	5.5	0.8
PI 223764	Afghanistan	6.2	1.0	17	6.3	1.0	13	6.2	1.1
PI 223765	Afghanistan	4.8	1.8	6	5.2	2.1	3	4.0	0.2
PI 225557	Zimbabwe	3.4	2.0	8	4.7	2.0	9	2.2	1.0
PI 226445	Israel	6.1	1.4	11	6.6	1.3	6	5.0	0.9

Table 11 (Continued).

PI 226459	Iran	6.0	1.8	6	5.2	1.7	3	7.6	0.5
PI 226460	Iran	5.3	1.7	16	5.1	1.8	13	5.6	1.6
PI 226506	Iran	5.1	0.9	6	5.5	0.7	5	4.6	0.9
PI 226634	Iran	5.6	1.3	11	5.4	1.2	4	6.1	1.9
PI 227202	Japan	4.7	1.9	6	4.7	2.5	4	4.6	0.9
PI 227203	Japan	3.2	1.8	6	2.4	1.1	4	4.4	2.0
PI 227204	Japan	3.7	1.1	5	2.8	0.3	5	4.5	0.7
PI 227205	Japan	4.8	1.3	7	4.9	1.6	3	4.5	0.4
PI 228237	Israel	4.2	1.1	20	4.1	1.3	10	4.4	0.7
PI 228238	Israel	5.4	1.3	5	6.0	0.6	2	3.9	1.5
PI 229604	Iran	5.1	1.4	8	4.7	0.9	6	5.6	1.9
PI 229605	Iran	4.8	1.2	18	4.9	1.2	11	4.5	1.3
PI 229686	Iran	3.9	1.2	4	4.0	1.0	4	3.9	1.6
PI 229748	Iran	4.8	0.9	11	4.6	1.0	7	5.1	0.7
PI 229749	Iran	5.1	1.0	8	4.8	0.7	2	6.4	0.1
PI 229806	Japan	4.1	1.3	8	3.8	1.5	4	4.9	0.6
PI 233556	Japan	4.5	1.6	9	4.6	1.0	6	4.4	2.4
PI 234287	Portugal	5.9	1.3	20	6.1	1.4	9	5.4	1.0
PI 234603	New Zealand	3.9	1.3	11	3.7	1.3	6	4.2	1.2
PI 240532	Iran	4.5	1.0	17	4.7	0.9	8	4.0	1.0
PI 240533	Iran	5.2	1.1	12	5.1	0.8	3	5.5	2.2
PI 241689	Chile	3.1	1.1	11	3.3	1.1	3	2.0	0.2
PI 242906	Afghanistan	5.7	1.4	8	5.5	1.2	5	6.0	1.7
PI 244017	South Africa	3.7	1.4	12	3.5	1.0	8	3.9	1.9
PI 244018	South Africa	3.5	1.5	6	4.0	1.3	5	2.9	1.7
PI 244019	South Africa	2.8	2.0	23	3.2	2.2	14	2.3	1.5
PI 246029	Chile	4.4	1.0	4	4.8	1.2	4	4.0	0.6
PI 246559	Senegal	4.3	1.3	9	4.0	1.5	8	4.7	1.0
PI 247398	Greece	3.2	2.0	2	1.5	4.1	7	3.6	1.1
PI 247399	Greece	4.3	1.7	14	3.8	1.4	3	6.5	0.6
PI 248178	Zaire	3.6	2.1	7	3.0	2.4	4	4.6	1.3
PI 248774	Namibia	3.8	1.2	9	3.9	1.4	4	3.7	0.4
PI 249008	Nigeria	3.5	1.4	5	4.4	0.6	3	2.1	1.3
PI 249009	Nigeria	3.0	1.6	7	3.8	1.6	5	2.0	0.8
PI 249010	Nigeria	4.7	1.1	7	5.2	0.7	4	3.8	1.1
PI 249559	Thailand	5.3	1.4	12	5.4	1.4	3	4.7	1.1
PI 250146	Pakistan	5.0	1.5	23	4.7	1.4	7	6.0	1.5
PI 251796	Yugoslavia	4.6	1.3	15	4.3	0.9	5	5.6	1.7
PI 253174	Yugoslavia	4.5	1.0	8	4.2	1.0	5	4.9	0.9
PI 254428	Lebanon	5.3	1.3	10	5.8	1.2	4	4.1	1.0
PI 254429	Lebanon	4.1	1.3	8	4.5	1.4	5	3.5	1.0
PI 254430	Lebanon	4.5	1.1	15	4.5	0.9	12	4.5	1.3

Table 11 (Continued).

PI 254622	Sudan	4.1	1.9	12	4.3	2.1	4	3.6	0.9
PI 254623	Sudan	4.1	1.8	24	4.0	1.9	14	4.2	1.6
PI 254624	Sudan	4.1	1.8	8	4.5	2.1	6	3.5	1.1
PI 254735	Senegal	3.9	1.3	11	4.1	1.2	6	3.5	1.4
PI 254736	Senegal	3.5	1.3	8	3.6	1.5	4	3.4	1.1
PI 254737	Senegal	5.1	2.2	7	4.3	1.5	5	6.2	2.7
PI 254738	Senegal	4.8	1.3	10	5.3	1.0	4	3.5	1.4
PI 254739	Senegal	4.2	1.6	9	4.7	1.9	7	3.5	0.7
PI 254740	Senegal	4.2	1.6	11	4.2	2.0	5	4.2	0.6
PI 254741	Senegal	4.0	0.9	11	3.8	1.0	4	4.6	0.3
PI 254742	Senegal	4.2	1.8	17	4.7	1.0	12	3.3	2.3
PI 254743	Senegal	4.5	0.8	12	4.5	0.7	8	4.6	1.0
PI 254744	Senegal	2.6	1.8	11	3.0	2.0	10	2.1	1.5
PI 255137	South Africa	3.5	1.6	19	3.2	1.7	15	3.9	1.4
PI 255139	South Africa	5.0	1.0	6	4.8	1.3	4	5.3	0.4
PI 255662	Afghanistan	4.3	1.1	11	4.2	1.0	6	4.7	1.2
PI 260733	Sudan	4.2	1.3	20	4.2	1.3	3	4.2	1.2
PI 266027	Venezuela	4.3	1.0	13	4.3	1.1	4	4.2	1.0
PI 266028	Venezuela	6.0	1.0	8	6.0	1.1	7	6.0	1.0
PI 269464	Pakistan	4.3	1.1	8	4.0	1.0	7	4.8	1.0
PI 269465	Pakistan	4.5	1.3	11	4.2	1.4	7	4.8	1.0
PI 269466	Pakistan	5.1	1.0	12	5.4	0.8	7	4.5	1.3
PI 269676	Belize	4.8	0.9	11	4.6	1.1	7	5.0	0.6
PI 269677	Belize	5.1	1.1	8	4.8	1.4	6	5.4	0.6
PI 269678	Belize	4.7	1.2	12	4.4	1.2	7	5.1	1.0
PI 269679	Belize	4.6	1.1	11	4.8	1.3	6	4.3	0.6
PI 269680	Belize	4.1	1.6	10	3.4	1.8	7	5.0	0.7
PI 269681	Belize	4.5	2.0	19	4.2	2.2	8	5.1	1.3
PI 270140	India	4.5	1.6	8	4.7	2.0	6	4.4	1.1
PI 270141	India	4.4	1.4	11	4.5	1.3	4	4.2	1.8
PI 270143	India	4.7	1.7	11	4.8	1.6	2	4.6	2.8
PI 270144	Greece	5.4	1.9	7	5.5	2.0	4	5.4	1.9
PI 270145	Greece	5.3	1.6	11	5.5	1.5	5	4.9	1.8
PI 270306	Philippines	4.3	1.6	8	4.4	1.9	4	4.3	1.2
PI 270307	Philippines	4.7	1.4	12	4.9	1.5	6	4.3	1.2
PI 270308	Philippines	3.9	1.2	18	4.1	1.2	6	3.6	1.4
PI 270309	Philippines	4.7	1.3	12	4.4	1.1	5	5.4	1.6
PI 270522	Hungary	4.0	1.4	16	3.5	1.3	6	5.1	0.9
PI 270523	United States	4.8	1.6	18	5.2	1.7	8	4.0	1.1
PI 270524	Israel	4.1	1.9	6	4.1	1.6	4	4.0	2.6
PI 270525	Israel	4.3	1.2	19	4.2	1.2	6	4.6	1.1
PI 270545	Sudan	4.2	1.0	11	4.0	0.8	5	4.7	1.4

Table 11 (Continued).

PI 270546	Ghana	3.3	1.1	11	3.1	1.2	5	3.6	1.1
PI 270547	Ghana	4.8	0.7	10	5.0	0.6	5	4.5	0.7
PI 270548	Ghana	4.6	1.3	12	4.6	1.4	6	4.7	1.3
PI 270549	Ghana	3.8	0.7	12	3.9	0.7	3	3.4	0.4
PI 270550	Ghana	4.7	1.5	13	4.7	1.7	5	4.8	1.1
PI 270551	Ghana	4.2	1.8	25	3.6	1.7	10	5.5	1.3
PI 270562	South Africa	4.4	2.2	19	4.9	2.2	9	3.4	2.0
PI 270563	South Africa	3.7	1.7	17	3.9	1.7	14	3.6	1.6
PI 270565	South Africa	4.6	1.4	8	4.0	1.5	7	5.2	0.9
PI 271132	Tunisia	4.5	1.3	18	4.5	1.2	10	4.5	1.4
PI 271133	Tunisia	4.1	1.5	22	3.9	1.1	12	4.3	2.1
PI 271466	India	4.4	1.2	6	4.4	1.4	7	4.4	1.0
PI 271468	India	6.4	0.6	2	6.4	0.6	0	0.0	0.0
PI 271747	Afghanistan	5.2	1.3	6	5.6	1.3	4	4.6	1.0
PI 271749	Afghanistan	5.5	0.8	6	5.6	0.5	2	5.1	1.8
PI 271750	Ghana	4.5	1.0	9	4.6	0.9	2	4.2	2.1
PI 271751	Ghana	4.6	1.9	11	4.2	2.2	6	5.3	0.3
PI 271752	Ghana	4.6	1.9	6	4.7	1.6	5	4.4	2.4
PI 271767	South Africa	5.1	1.1	13	5.1	1.3	9	5.1	0.9
PI 271769	South Africa	3.7	1.4	6	4.4	1.4	5	2.9	0.7
PI 271770	South Africa	3.0	1.1	27	2.7	1.1	16	3.7	0.8
PI 271771	South Africa	2.8	2.1	20	2.7	2.1	3	4.0	1.2
PI 271773	South Africa	3.2	1.2	10	3.4	0.8	7	2.8	1.5
PI 271774	South Africa	3.8	1.3	19	3.5	0.9	12	4.2	1.6
PI 271775	South Africa	5.0	1.2	9	4.9	1.3	5	5.1	1.2
PI 271776	South Africa	3.8	1.0	9	3.7	1.0	5	4.1	1.0
PI 271777	South Africa	4.7	1.3	10	5.0	1.3	6	4.3	1.1
PI 271778	South Africa	4.2	1.4	11	4.2	0.6	6	4.4	2.3
PI 271779	South Africa	3.9	1.4	10	3.3	1.5	6	4.7	0.6
PI 271982	Somalia	3.2	1.4	2	0.9	0.3	7	3.8	0.7
PI 271983	Somalia	4.1	1.3	10	4.4	1.3	7	3.8	1.2
PI 271984	Somalia	3.8	1.7	12	3.7	1.8	5	4.2	1.4
PI 271985	Somalia	5.2	1.1	10	5.2	1.1	5	5.2	1.2
PI 271986	Somalia	4.4	1.6	11	4.4	1.5	4	4.3	1.9
PI 271987	Somalia	4.0	1.2	8	3.8	1.1	4	4.3	1.4
PI 271988	Somalia	3.9	1.3	6	4.5	1.4	4	3.0	0.4
PI 273479	Ethiopia	4.2	1.2	10	4.2	1.4	4	4.3	0.7
PI 273480	Ethiopia	5.5	1.1	12	5.8	1.1	4	4.6	0.7
PI 273481	Ethiopia	4.7	1.1	8	5.2	1.0	6	4.1	0.8
PI 274035	South Africa	3.3	2.4	9	3.6	2.6	3	2.5	2.0
PI 274785	India	4.2	1.9	20	4.4	1.5	5	3.5	3.2
PI 274794	Pakistan	4.5	1.4	22	4.3	1.5	12	4.8	1.3

Table 11 (Continued).

PI 274795	Pakistan	4.6	1.4	8	4.9	1.5	5	4.0	1.1
PI 275628	Pakistan	4.6	1.5	5	5.2	1.7	5	4.0	1.2
PI 275631	India	4.9	1.9	26	5.0	2.1	9	4.8	1.2
PI 275632	India	3.9	1.0	5	3.9	0.9	2	3.9	1.5
PI 276658	Soviet Union	4.3	1.6	21	4.4	1.6	10	3.9	1.7
PI 276659	Soviet Union	4.5	1.1	21	4.4	1.2	12	4.7	1.0
PI 277279	India	4.2	1.8	4	3.9	2.6	4	4.4	0.4
PI 277970	Turkey	4.4	1.6	16	4.3	1.8	9	4.5	1.5
PI 277971	Turkey	4.8	1.7	19	4.3	1.2	13	5.4	2.3
PI 277972	Turkey	4.9	1.6	18	5.3	1.5	10	4.1	1.4
PI 277973	Turkey	4.8	1.3	22	4.6	1.2	12	5.1	1.4
PI 277974	Turkey	5.8	1.3	7	5.3	1.1	3	6.8	1.2
PI 277975	Turkey	4.2	1.7	5	5.1	2.1	6	3.5	1.1
PI 277976	Turkey	4.6	1.5	9	5.0	1.6	5	4.0	1.0
PI 277977	Turkey	4.4	1.4	24	4.5	1.4	11	4.3	1.5
PI 277978	Turkey	5.1	1.8	17	5.1	1.9	8	4.9	1.4
PI 277979	Turkey	3.3	1.9	19	3.0	2.2	10	3.8	0.9
PI 277980	Turkey	3.5	1.7	6	2.7	1.0	2	5.8	0.2
PI 277981	Turkey	3.8	1.1	15	3.8	1.1	5	3.8	1.2
PI 277983	Turkey	4.6	1.1	24	4.7	1.0	6	4.5	1.6
PI 277984	Turkey	4.6	1.2	8	5.0	1.3	6	4.1	1.0
PI 277985	Turkey	5.0	1.7	20	5.3	1.5	9	4.3	2.0
PI 277986	Turkey	4.5	2.0	13	5.2	2.0	7	3.2	1.2
PI 277987	Turkey	4.0	1.6	17	4.0	1.5	3	3.9	2.6
PI 277988	Turkey	4.9	1.5	14	5.2	1.6	5	3.9	0.9
PI 277989	Turkey	5.4	2.1	19	5.3	2.5	11	5.5	1.4
PI 277990	Turkey	4.7	1.3	17	4.7	0.8	9	4.9	2.0
PI 277991	Turkey	5.7	1.0	25	5.7	1.0	6	5.4	0.9
PI 277992	Turkey	4.3	1.7	10	5.0	1.5	6	3.3	1.6
PI 277993	Turkey	4.7	1.6	16	5.2	1.6	12	4.1	1.4
PI 277994	Turkey	3.9	1.9	6	5.1	1.2	5	2.4	1.6
PI 277995	Turkey	4.7	1.0	24	4.9	1.0	8	4.2	0.8
PI 277996	Turkey	5.1	1.6	7	4.6	2.0	5	5.7	0.7
PI 277997	Turkey	4.9	1.3	20	4.4	1.3	15	5.5	1.1
PI 277998	Turkey	4.4	1.3	19	4.6	1.3	11	4.0	1.3
PI 277999	Turkey	3.8	1.6	19	3.6	1.9	14	4.2	1.2
PI 278000	Turkey	5.4	1.0	18	5.5	1.0	6	5.0	1.0
PI 278001	Turkey	3.7	2.4	16	2.8	2.3	8	5.5	1.5
PI 278002	Turkey	4.9	1.4	21	5.2	1.2	8	4.1	1.7
PI 278003	Turkey	5.3	1.8	17	5.3	2.0	9	5.3	1.4
PI 278004	Turkey	4.3	1.1	19	4.4	1.2	10	4.2	0.9
PI 278005	Turkey	4.4	1.6	21	4.3	1.5	11	4.4	1.9

Table 11 (Continued).

PI 278006	Turkey	4.5	1.4	8	5.0	1.1	4	3.3	1.5
PI 278008	Turkey	4.8	1.4	18	5.2	1.2	9	4.0	1.6
PI 278009	Turkey	4.4	1.7	16	3.8	1.7	10	5.2	1.3
PI 278010	Turkey	5.0	1.7	17	5.0	1.7	5	5.3	1.7
PI 278011	Turkey	5.1	1.7	22	5.4	1.9	9	4.2	0.8
PI 278012	Turkey	5.2	1.7	21	5.2	1.9	11	5.3	1.4
PI 278013	Turkey	5.1	1.7	18	5.5	1.1	7	4.1	2.5
PI 278014	Turkey	4.3	1.1	19	4.5	1.2	7	3.9	1.0
PI 278015	Turkey	4.7	1.4	17	4.7	1.5	3	5.0	0.3
PI 278016	Turkey	4.4	0.9	4	4.3	0.9	3	4.5	1.0
PI 278017	Turkey	4.8	1.0	25	4.7	1.2	13	5.0	0.8
PI 278018	Turkey	4.1	1.4	21	4.1	1.6	10	4.1	1.1
PI 278019	Turkey	4.8	1.0	22	4.8	1.1	14	4.9	0.9
PI 278020	Turkey	5.6	1.2	12	6.1	1.1	5	4.6	0.8
PI 278021	Turkey	5.1	1.5	15	4.9	1.6	10	5.4	1.4
PI 278022	Turkey	4.6	0.8	16	4.6	0.8	8	4.8	0.9
PI 278023	Turkey	4.9	0.9	8	4.8	0.9	5	5.2	1.0
PI 278024	Turkey	4.1	1.2	3	5.0	1.3	5	3.5	0.9
PI 278025	Turkey	4.7	2.0	26	4.6	2.2	8	4.9	1.6
PI 278026	Turkey	4.1	1.5	21	3.9	1.4	14	4.3	1.6
PI 278027	Turkey	4.8	1.2	17	4.6	1.2	9	5.2	1.2
PI 278028	Turkey	5.0	1.0	9	5.1	1.1	5	4.7	1.0
PI 278029	Turkey	4.4	1.4	19	4.5	1.4	9	4.4	1.7
PI 278030	Turkey	4.5	1.5	5	5.5	1.1	5	3.4	1.2
PI 278031	Turkey	4.3	1.3	23	4.0	1.3	11	4.9	1.2
PI 278032	Turkey	5.6	1.3	6	5.3	1.6	3	6.0	0.3
PI 278033	Turkey	4.3	0.9	7	4.0	0.6	3	4.8	1.2
PI 278036	Turkey	5.2	2.8	3	4.4	0.5	5	5.6	3.6
PI 278037	Turkey	4.9	1.3	15	4.9	1.3	7	4.7	1.2
PI 278038	Turkey	3.9	1.4	4	4.6	1.6	5	3.4	1.0
PI 278040	Turkey	4.8	1.4	9	5.0	1.4	6	4.4	1.5
PI 278041	Turkey	6.1	1.6	5	5.8	0.5	4	6.6	2.5
PI 278042	Turkey	5.2	0.7	6	5.2	0.8	3	5.2	0.7
PI 278043	Turkey	3.4	1.0	8	3.4	1.0	1	3.4	0.0
PI 278044	Turkey	5.2	2.1	20	5.4	2.0	6	4.5	2.5
PI 278045	Turkey	4.3	1.5	22	4.3	1.4	7	4.5	2.1
PI 278046	Turkey	4.6	1.3	5	4.0	0.8	5	5.1	1.5
PI 278047	Turkey	4.9	1.6	23	4.8	1.4	9	5.3	2.2
PI 278048	Turkey	5.2	1.3	6	5.3	1.0	4	5.1	1.8
PI 278049	Turkey	4.8	1.4	20	5.1	0.9	8	4.3	2.3
PI 278050	Turkey	4.5	1.1	15	4.7	0.9	8	4.2	1.4
PI 278051	Turkey	4.8	1.1	22	4.8	1.2	7	4.8	0.7

Table 11 (Continued).

PI 278053	Turkey	3.5	1.8	19	3.3	2.0	9	4.0	1.2
PI 278054	Turkey	5.1	1.2	6	4.8	1.6	7	5.3	0.7
PI 278055	Turkey	3.9	1.3	16	3.9	1.0	6	3.8	2.1
PI 278057	Turkey	4.8	1.0	22	4.7	0.8	11	4.9	1.4
PI 278058	Turkey	5.3	1.8	5	5.2	1.6	3	5.5	2.5
PI 278060	Turkey	5.0	2.2	16	4.4	2.2	8	6.3	1.5
PI 278061	Turkey	4.7	1.9	12	3.8	1.0	9	5.8	2.2
PI 279456	Japan	3.5	1.9	14	3.2	2.1	6	4.1	0.8
PI 279458	Japan	3.4	1.6	10	3.5	1.7	1	3.1	0.0
PI 279459	Japan	4.2	1.3	22	4.1	1.4	9	4.7	1.1
PI 279460	Japan	3.5	1.2	4	3.5	1.3	5	3.5	1.3
PI 279461	Japan	2.3	1.3	8	2.8	1.5	6	1.7	0.6
PI 279462	Japan	4.6	1.1	7	4.8	0.9	3	4.0	1.5
PI 288232	Egypt	4.5	1.6	21	4.3	1.7	10	4.8	1.6
PI 288316	India	4.4	1.3	9	4.2	1.3	6	4.7	1.4
PI 288317	India	3.9	1.3	5	3.0	1.2	5	4.7	0.7
PI 288522	India	4.9	1.1	5	4.5	0.7	5	5.3	1.3
PI 290855	United States	4.1	1.8	5	3.9	1.8	3	4.4	2.2
PI 293765	Soviet Union	4.7	1.2	21	4.8	1.3	8	4.4	1.1
PI 293766	Soviet Union	4.7	1.1	14	4.5	1.0	2	5.9	1.1
PI 295845	South Africa	5.3	0.9	6	5.2	1.1	4	5.4	0.8
PI 295850	South Africa	3.5	1.5	4	2.2	0.4	5	4.5	1.2
PI 296332	South Africa	2.9	1.2	7	2.7	1.4	6	3.1	0.9
PI 296334	South Africa	4.3	1.1	20	4.3	1.0	9	4.4	1.4
PI 296335	South Africa	3.8	1.3	14	3.9	1.2	8	3.5	1.4
PI 296337	South Africa	3.0	0.8	9	2.7	0.8	5	3.6	0.6
PI 296339	South Africa	2.9	1.1	1	2.9	0.0	6	2.9	1.2
PI 296341	South Africa	3.4	1.0	7	3.1	0.7	4	3.9	1.4
PI 296342	South Africa	3.3	1.2	13	3.2	1.0	9	3.6	1.5
PI 296343	South Africa	3.1	1.5	8	2.7	1.0	6	3.5	2.1
PI 296384	Iran	5.3	1.0	21	5.2	1.1	12	5.5	0.9
PI 299378	South Africa	3.9	1.1	18	4.1	1.0	3	2.9	1.3
PI 299379	South Africa	3.8	1.1	8	4.0	0.9	6	3.6	1.3
PI 299563	South Africa	3.9	1.3	7	4.1	1.5	5	3.7	1.1
PI 306365	Taiwan	3.7	1.4	19	3.5	1.3	11	4.0	1.5
PI 306366	Taiwan	4.2	1.7	3	3.5	2.7	5	4.6	0.8
PI 306367	Angola	4.4	1.4	18	4.4	1.4	12	4.4	1.5
PI 306782	Nigeria	4.0	1.8	11	3.6	1.7	6	4.6	1.8
PI 307608	Nigeria	4.3	1.0	17	4.5	0.8	7	3.7	1.3
PI 307609	Nigeria	4.4	1.3	9	4.6	1.4	3	3.8	0.2
PI 307748	Philippines	4.4	1.6	22	4.2	1.7	7	5.0	1.5
PI 307749	Philippines	5.1	0.7	7	5.3	0.8	3	4.6	0.3

Table 11 (Continued).

PI 307750	Philippines	4.1	1.8	10	3.9	2.2	7	4.3	1.0
PI 314148	Soviet Union	4.1	1.1	14	3.8	1.0	2	5.6	0.2
PI 314178	Soviet Union	4.2	1.4	15	3.5	1.1	11	5.1	1.1
PI 314236	Soviet Union	4.8	2.0	5	4.1	1.7	4	5.6	2.2
PI 314655	Soviet Union	4.9	1.6	17	4.5	1.4	8	5.6	1.9
PI 319212	Egypt	4.5	1.3	18	4.4	1.5	11	4.7	1.0
PI 319235	Japan	4.1	1.5	19	4.2	1.5	3	3.6	1.6
PI 319237	Japan	3.2	2.5	11	2.7	2.3	6	4.0	2.9
PI 325248	Soviet Union	3.9	1.8	15	3.3	1.6	10	4.7	1.8
PI 326515	Ghana	3.6	1.3	15	3.5	1.4	12	3.9	1.2
PI 331106	Uruguay	5.2	1.1	14	5.5	1.2	8	4.7	0.9
PI 344066	Turkey	4.9	1.3	20	5.1	1.2	8	4.5	1.4
PI 344298	Turkey	4.1	1.1	4	4.9	0.9	4	3.3	0.3
PI 344300	Turkey	4.5	1.6	16	4.2	1.6	4	5.5	1.5
PI 344301	Turkey	5.1	2.0	21	5.3	1.9	10	4.6	2.2
PI 344395	Iran	5.2	1.3	7	5.6	1.1	2	3.8	0.2
PI 345543	Soviet Union	4.5	1.8	18	4.7	1.9	15	4.3	1.6
PI 345545	Soviet Union	4.3	1.8	4	4.5	2.4	3	3.9	0.7
PI 345547	Soviet Union	3.7	1.1	20	3.8	1.0	8	3.6	1.5
PI 346082	Afghanistan	3.5	2.8	5	2.6	2.6	3	4.9	3.0
PI 346787	United States	5.0	1.3	16	5.2	1.0	8	4.6	1.7
PI 357656	Yugoslavia	4.3	1.2	22	4.6	1.0	11	3.8	1.2
PI 357657	Yugoslavia	4.8	1.7	11	5.6	1.4	5	3.2	1.1
PI 357658	Yugoslavia	5.5	1.2	11	5.7	1.2	2	4.5	0.9
PI 357659	Yugoslavia	4.8	1.3	6	4.7	1.5	3	5.0	0.8
PI 357660	Yugoslavia	5.8	1.1	8	5.9	0.6	5	5.8	1.8
PI 357661	Yugoslavia	5.1	1.4	3	5.6	0.2	4	4.8	1.8
PI 357662	Yugoslavia	4.8	1.7	2	4.6	2.4	6	4.9	1.7
PI 357663	Yugoslavia	4.1	2.2	7	4.3	1.6	3	3.5	3.7
PI 357664	Yugoslavia	4.2	1.3	6	5.0	1.1	5	3.2	0.5
PI 357665	Yugoslavia	5.0	1.5	21	5.1	1.5	13	4.7	1.6
PI 357666	Yugoslavia	5.3	0.4	6	5.5	0.4	4	5.0	0.4
PI 357667	Yugoslavia	5.3	1.1	5	5.9	0.7	4	4.7	1.2
PI 357668	Yugoslavia	4.6	1.4	22	4.6	1.3	11	4.6	1.7
PI 357669	Yugoslavia	4.7	1.5	21	4.8	1.2	8	4.5	2.3
PI 357671	Yugoslavia	4.0	1.4	17	3.7	0.9	12	4.3	1.9
PI 357672	Yugoslavia	4.2	1.3	8	4.5	1.3	3	3.3	1.0
PI 357673	Yugoslavia	5.1	1.6	23	5.6	1.7	13	4.2	1.2
PI 357674	Yugoslavia	4.2	2.1	8	4.1	2.1	4	4.3	2.4
PI 357675	Yugoslavia	4.6	1.4	21	4.4	0.9	12	4.8	2.0
PI 357676	Yugoslavia	4.0	1.5	22	4.0	1.6	10	4.0	1.1
PI 357677	Yugoslavia	3.3	1.5	4	2.8	2.2	5	3.6	0.4

Table 11 (Continued).

PI 357678	Yugoslavia	3.3	1.6	7	3.3	1.8	3	3.4	1.2
PI 357679	Yugoslavia	3.9	1.6	5	3.4	2.1	4	4.4	0.6
PI 357680	Yugoslavia	5.6	1.3	7	5.9	1.4	2	4.7	0.4
PI 357681	Yugoslavia	4.7	1.4	23	4.9	1.1	7	4.3	2.2
PI 357682	Yugoslavia	5.1	1.8	21	5.0	2.0	11	5.3	1.4
PI 357683	Yugoslavia	4.9	1.2	22	5.3	1.1	7	3.8	0.5
PI 357684	Yugoslavia	4.4	1.1	11	4.4	1.2	4	4.3	0.5
PI 357685	Yugoslavia	4.1	0.9	11	3.8	0.8	6	4.5	1.1
PI 357686	Yugoslavia	4.6	1.7	20	4.3	1.2	11	5.3	2.3
PI 357688	Yugoslavia	4.0	1.6	9	4.5	1.2	6	3.3	1.9
PI 357689	Yugoslavia	5.7	1.2	9	5.6	0.9	7	5.9	1.6
PI 357690	Yugoslavia	4.4	1.5	10	4.4	1.7	5	4.4	1.3
PI 357691	Yugoslavia	4.9	1.6	4	5.7	0.6	5	4.2	1.9
PI 357692	Yugoslavia	5.1	1.6	6	5.7	0.6	4	4.1	2.2
PI 357693	Yugoslavia	4.9	0.7	5	4.5	0.5	2	5.8	0.1
PI 357694	Yugoslavia	5.2	1.7	5	4.9	1.4	5	5.4	2.1
PI 357695	Yugoslavia	4.0	1.7	6	3.6	1.3	4	4.7	2.1
PI 357696	Yugoslavia	4.5	1.0	11	4.6	1.0	6	4.3	1.1
PI 357697	Yugoslavia	4.4	1.6	4	5.0	1.7	4	3.8	1.4
PI 357698	Yugoslavia	5.0	1.2	23	5.4	1.2	12	4.2	0.7
PI 357699	Yugoslavia	5.4	1.6	22	5.4	1.9	10	5.5	0.9
PI 357701	Yugoslavia	4.9	1.5	16	4.9	1.6	13	4.8	1.5
PI 357702	Yugoslavia	3.8	1.2	6	4.0	1.0	4	3.5	1.5
PI 357703	Yugoslavia	4.2	1.0	6	4.3	0.9	4	4.0	1.2
PI 357704	Yugoslavia	5.2	1.4	8	5.6	1.2	6	4.6	1.6
PI 357705	Yugoslavia	4.1	1.5	21	3.9	1.7	13	4.5	1.3
PI 357706	Yugoslavia	3.9	0.9	7	3.6	1.0	3	4.4	0.3
PI 357707	Yugoslavia	4.4	1.1	24	4.5	1.2	10	4.2	0.6
PI 357709	Yugoslavia	4.8	1.1	22	4.9	1.2	13	4.7	1.0
PI 357710	Yugoslavia	4.3	1.4	12	3.8	1.4	14	4.8	1.4
PI 357711	Yugoslavia	3.9	0.6	3	4.0	0.8	5	3.9	0.6
PI 357712	Yugoslavia	4.4	0.8	20	4.5	0.7	9	4.3	1.0
PI 357713	Yugoslavia	4.2	1.6	8	4.5	1.8	7	3.8	1.3
PI 357714	Yugoslavia	5.1	2.2	7	6.4	0.8	4	2.8	1.8
PI 357717	Yugoslavia	3.8	1.4	6	3.3	1.8	6	4.2	0.8
PI 357718	Yugoslavia	4.8	0.6	6	4.9	0.4	4	4.6	0.9
PI 357719	Yugoslavia	5.0	1.3	2	5.3	0.2	6	4.9	1.6
PI 357720	Yugoslavia	4.2	2.7	5	3.4	2.4	2	6.3	2.9
PI 357721	Yugoslavia	5.3	1.2	7	5.2	0.9	4	5.5	1.8
PI 357722	Yugoslavia	4.7	1.1	24	4.4	1.1	14	5.2	1.1
PI 357723	Yugoslavia	4.9	1.4	24	5.0	1.4	10	4.5	1.3
PI 357724	Yugoslavia	4.1	1.5	6	3.6	1.4	5	4.6	1.5

Table 11 (Continued).

PI 357725	Yugoslavia	5.2	1.0	9	5.7	0.6	5	4.5	1.1
PI 357726	Yugoslavia	4.8	1.4	10	5.6	0.8	7	3.8	1.4
PI 357727	Yugoslavia	5.0	0.9	9	5.1	1.0	7	4.9	0.8
PI 357728	Yugoslavia	4.8	1.0	7	4.6	1.2	3	5.2	0.4
PI 357729	Yugoslavia	4.7	1.2	22	4.8	1.3	8	4.4	0.8
PI 357730	Yugoslavia	4.1	1.4	19	4.5	1.5	10	3.4	0.9
PI 357731	Yugoslavia	4.8	1.5	5	4.8	1.9	3	4.9	0.9
PI 357733	Yugoslavia	4.5	0.8	11	4.5	0.8	6	4.5	0.7
PI 357734	Yugoslavia	4.9	1.2	8	4.8	1.3	2	5.1	1.0
PI 357735	Yugoslavia	5.9	2.1	9	5.0	1.5	5	7.7	1.7
PI 357736	Yugoslavia	5.1	1.6	9	5.2	1.7	5	4.8	1.7
PI 357737	Yugoslavia	4.6	2.0	5	5.0	2.5	3	4.1	1.0
PI 357738	Yugoslavia	4.4	1.6	22	4.3	1.7	7	4.8	1.1
PI 357739	Yugoslavia	4.0	1.6	17	3.9	1.5	1	6.5	0.0
PI 357741	Yugoslavia	5.7	1.3	9	5.9	1.3	4	5.3	1.5
PI 357742	Yugoslavia	4.3	1.9	4	4.0	2.2	4	4.6	1.8
PI 357743	Yugoslavia	4.4	1.6	20	4.3	1.6	7	4.8	1.8
PI 357744	Yugoslavia	3.7	2.3	7	4.7	1.5	3	1.3	2.2
PI 357745	Yugoslavia	5.0	1.1	17	4.7	1.2	13	5.3	0.8
PI 357746	Yugoslavia	3.8	1.8	8	3.7	1.8	1	4.8	0.0
PI 357748	Yugoslavia	4.0	1.4	22	4.3	1.4	13	3.6	1.4
PI 357752	Yugoslavia	4.6	1.0	20	4.6	0.9	10	4.7	1.2
PI 357753	Yugoslavia	5.1	0.6	4	4.7	0.4	6	5.4	0.5
PI 357754	Yugoslavia	4.1	1.1	21	4.3	1.0	9	3.5	1.0
PI 368493	Yugoslavia	4.2	1.0	27	3.9	0.9	12	4.8	0.9
PI 368495	Yugoslavia	5.1	1.3	11	4.8	1.1	5	5.6	1.6
PI 368497	Yugoslavia	5.4	1.3	9	5.3	1.4	3	5.5	1.1
PI 368499	Yugoslavia	5.2	1.2	25	5.2	1.3	13	5.0	1.2
PI 368500	Yugoslavia	4.6	1.2	11	5.0	1.2	7	4.0	1.1
PI 368501	Yugoslavia	4.8	1.4	11	4.5	1.6	5	5.4	0.6
PI 368502	Yugoslavia	3.7	1.3	5	4.0	1.4	4	3.4	1.3
PI 368503	Yugoslavia	5.0	1.3	20	5.3	1.1	6	4.0	1.6
PI 368506	Yugoslavia	4.8	1.2	11	4.6	1.1	4	5.4	1.6
PI 368507	Yugoslavia	4.6	0.9	10	5.0	0.9	7	4.1	0.7
PI 368509	Yugoslavia	3.9	1.6	8	3.7	1.0	4	4.4	2.5
PI 368510	Yugoslavia	5.7	1.0	10	5.6	1.1	3	6.1	0.6
PI 368511	Yugoslavia	5.1	1.5	9	5.7	1.1	4	3.8	1.5
PI 368512	Yugoslavia	3.6	0.9	9	3.6	1.0	3	3.9	0.5
PI 368513	Yugoslavia	5.6	0.9	6	6.1	0.6	4	4.7	0.4
PI 368514	Yugoslavia	4.2	1.5	8	4.4	1.7	4	3.8	0.5
PI 368515	Yugoslavia	4.4	1.8	8	4.7	2.1	3	3.7	0.1
PI 368516	Yugoslavia	4.1	1.9	6	5.0	1.9	5	3.1	1.4

Table 11 (Continued).

PI 368518	Yugoslavia	5.1	1.4	17	4.7	1.2	17	5.5	1.4
PI 368520	Yugoslavia	4.9	0.9	7	4.8	1.1	3	5.2	0.6
PI 368521	Yugoslavia	5.1	1.2	11	4.7	0.9	5	6.1	1.5
PI 368522	Yugoslavia	4.1	1.1	10	4.3	0.8	7	3.7	1.3
PI 368523	Yugoslavia	4.4	1.2	5	4.1	1.7	5	4.6	0.5
PI 368524	Yugoslavia	4.8	1.4	13	4.5	1.3	7	5.4	1.3
PI 368525	Yugoslavia	4.0	1.1	28	3.9	1.2	12	4.1	0.9
PI 368527	Yugoslavia	4.7	1.1	11	4.5	0.9	6	5.1	1.2
PI 368528	Yugoslavia	4.5	1.4	11	4.7	1.6	5	4.0	0.7
PI 368529	Yugoslavia	4.3	1.6	27	4.4	1.5	15	4.0	1.8
PI 368530	Yugoslavia	4.5	1.6	9	4.5	1.8	5	4.5	1.3
PI 369220	Soviet Union	4.6	1.2	3	3.9	1.7	6	4.9	1.0
PI 370015	India	5.0	1.3	19	5.0	1.1	7	5.1	1.7
PI 370018	India	4.7	1.2	9	4.9	1.3	3	4.4	0.6
PI 370422	Yugoslavia	4.8	1.1	20	4.9	1.1	8	4.5	1.1
PI 370423	Yugoslavia	5.1	0.9	22	5.2	0.9	12	5.0	0.9
PI 370424	Yugoslavia	4.8	1.0	6	4.8	1.1	4	4.8	1.1
PI 370426	Yugoslavia	4.5	0.9	9	4.9	0.8	6	3.8	0.7
PI 370427	Yugoslavia	4.1	1.4	8	4.2	1.7	6	3.9	1.0
PI 370428	Yugoslavia	4.8	1.5	6	5.2	1.7	4	4.3	1.0
PI 370429	Yugoslavia	5.1	1.7	8	5.6	1.8	5	4.3	1.1
PI 370430	Yugoslavia	3.9	1.6	7	3.9	2.1	5	3.9	0.8
PI 370433	Yugoslavia	5.1	1.2	11	5.1	1.3	4	5.3	0.9
PI 370434	Yugoslavia	5.6	0.7	10	5.7	0.6	3	5.6	1.0
PI 378611	Zaire	3.5	1.4	7	3.0	1.6	5	4.1	0.9
PI 378612	Zaire	3.5	1.5	9	3.7	1.8	4	2.9	0.6
PI 378613	Zaire	3.8	1.1	23	3.7	1.2	10	4.0	1.0
PI 378615	Zaire	4.3	1.6	6	4.1	2.2	5	4.7	0.4
PI 378616	Zaire	4.1	1.7	5	3.2	1.4	4	5.2	1.5
PI 378617	Zaire	5.1	2.2	10	5.5	1.7	4	4.3	3.3
PI 379222	Yugoslavia	5.1	1.9	7	5.4	1.3	6	4.8	2.6
PI 379223	Yugoslavia	4.7	1.3	8	4.8	1.4	7	4.6	1.2
PI 379224	Yugoslavia	5.2	1.2	8	5.2	1.4	5	5.1	0.9
PI 379225	Yugoslavia	5.4	0.9	13	5.4	0.7	6	5.2	1.3
PI 379226	Yugoslavia	5.0	1.3	10	5.2	1.4	2	4.1	0.4
PI 379227	Yugoslavia	5.6	1.1	8	5.6	0.5	5	5.6	1.8
PI 379228	Yugoslavia	4.3	1.7	22	4.1	2.0	14	4.6	1.1
PI 379229	Yugoslavia	4.2	1.4	11	4.1	1.5	3	4.3	1.4
PI 379230	Yugoslavia	5.2	1.4	22	4.9	1.2	10	5.9	1.5
PI 379231	Yugoslavia	5.1	1.6	11	5.4	0.9	6	4.7	2.6
PI 379232	Yugoslavia	4.7	1.3	12	4.7	1.5	6	4.7	0.7
PI 379233	Yugoslavia	4.5	1.2	12	4.7	1.4	5	3.9	0.5

Table 11 (Continued).

PI 379234	Yugoslavia	4.6	0.8	9	4.6	0.9	4	4.5	0.5
PI 379235	Yugoslavia	5.0	1.4	9	4.6	0.9	3	6.0	2.2
PI 379236	Yugoslavia	4.6	1.5	11	4.4	1.2	6	4.9	2.0
PI 379237	Yugoslavia	4.8	1.5	5	5.2	1.1	2	4.0	2.5
PI 379238	Yugoslavia	5.6	1.1	11	5.7	1.1	2	5.1	0.1
PI 379239	Yugoslavia	5.0	1.0	10	5.1	1.1	5	4.7	0.8
PI 379240	Yugoslavia	4.4	1.8	6	3.8	1.5	3	5.6	2.2
PI 379241	Yugoslavia	4.9	0.9	7	4.8	0.7	5	5.1	1.1
PI 379242	Yugoslavia	4.3	1.4	10	4.2	1.6	5	4.5	1.1
PI 379243	Yugoslavia	2.9	1.8	10	3.5	0.9	6	2.1	2.7
PI 379245	Yugoslavia	4.7	1.8	9	5.0	1.9	5	4.0	1.3
PI 379246	Yugoslavia	4.9	1.0	5	5.1	1.2	4	4.7	0.9
PI 379247	Yugoslavia	4.8	1.5	9	4.5	1.6	5	5.4	1.1
PI 379248	Yugoslavia	3.8	1.3	12	3.1	0.9	7	5.1	0.8
PI 379249	Yugoslavia	4.8	1.6	5	4.1	1.5	4	5.8	1.4
PI 379250	Yugoslavia	4.9	1.0	9	4.7	0.9	4	5.2	1.2
PI 379251	Yugoslavia	3.9	1.1	12	4.0	1.0	7	3.8	1.4
PI 379252	Yugoslavia	5.6	1.1	11	5.5	1.2	4	5.9	0.6
PI 379253	Yugoslavia	4.7	1.3	10	4.1	1.1	6	5.6	1.1
PI 379254	Yugoslavia	4.6	1.4	10	4.5	1.4	5	4.9	1.4
PI 379255	Yugoslavia	4.9	2.1	7	4.2	1.9	5	5.9	2.0
PI 379256	Yugoslavia	4.3	0.9	5	4.5	1.0	6	4.2	0.9
PI 379257	Yugoslavia	4.7	0.9	10	5.2	0.8	7	4.0	0.4
PI 381694	India	5.0	1.3	7	4.5	1.2	5	5.6	1.3
PI 381695	India	4.4	1.0	4	5.0	0.7	6	4.0	1.0
PI 381696	India	5.4	0.8	9	5.4	0.8	2	5.3	0.6
PI 381697	India	4.8	1.7	10	5.0	1.5	5	4.3	2.2
PI 381698	India	4.2	1.5	9	3.6	1.7	6	5.2	0.5
PI 381699	India	5.6	0.4	4	5.4	0.2	4	5.7	0.5
PI 381700	India	5.0	1.4	10	4.5	0.9	4	6.2	1.9
PI 381701	India	5.1	1.1	10	5.7	1.0	7	4.4	0.7
PI 381703	India	4.7	1.3	7	4.8	1.4	6	4.5	1.3
PI 381704	India	4.9	0.9	7	4.5	0.8	6	5.3	0.9
PI 381705	India	4.6	1.1	5	4.2	1.3	7	4.8	0.9
PI 381706	India	4.3	1.3	11	4.4	1.4	7	4.1	1.2
PI 381707	India	4.3	1.0	10	4.1	1.1	6	4.5	1.0
PI 381708	India	4.1	1.5	12	3.6	1.2	5	5.5	1.6
PI 381709	India	4.0	1.5	10	3.1	1.0	6	5.5	0.9
PI 381711	India	4.2	1.0	8	3.9	1.0	6	4.7	0.9
PI 381713	India	3.9	1.4	13	4.2	1.3	14	3.5	1.4
PI 381714	India	5.3	1.2	11	5.7	1.2	6	4.6	0.8
PI 381715	India	5.0	1.2	11	5.0	1.0	5	4.9	1.7

Table 11 (Continued).

PI 381716	India	4.4	1.2	10	4.5	1.1	7	4.2	1.4
PI 381717	India	5.1	1.3	10	5.5	1.1	5	4.2	1.2
PI 381718	India	4.7	2.0	8	5.1	1.4	4	4.0	3.0
PI 381719	India	4.3	1.1	8	4.1	1.4	8	4.5	0.7
PI 381720	India	3.9	1.5	12	3.9	1.4	10	3.8	1.8
PI 381721	India	4.3	1.9	13	4.2	2.1	5	4.6	1.0
PI 381722	India	3.8	1.3	6	3.7	1.5	6	3.8	1.1
PI 381723	India	5.4	2.0	12	5.4	2.1	5	5.4	2.1
PI 381725	India	5.3	1.1	8	5.3	1.2	4	5.3	1.0
PI 381728	India	5.6	1.0	12	5.8	0.9	4	5.0	0.9
PI 381731	India	4.9	0.8	9	4.3	0.7	7	5.5	0.3
PI 381733	India	4.4	1.3	8	4.1	1.2	4	5.1	1.2
PI 381734	India	6.0	1.4	11	6.2	1.5	4	5.4	1.3
PI 381737	India	5.3	1.4	7	5.0	1.4	2	6.6	0.3
PI 381739	India	4.2	1.9	7	3.4	1.9	5	5.5	1.3
PI 381740	India	5.5	1.0	9	5.3	0.9	5	5.8	1.1
PI 381741	India	4.8	1.0	6	5.0	1.1	3	4.4	0.9
PI 385964	Kenya	4.2	1.2	6	4.3	1.5	4	4.1	0.7
PI 388021	India	4.4	0.8	10	4.4	0.8	7	4.5	0.7
PI 392291	Kenya	4.5	1.3	10	4.6	1.5	5	4.2	1.0
PI 415095	Honduras	3.8	1.7	13	3.2	1.9	9	4.7	1.0
PI 418762	Afghanistan	5.3	1.1	4	5.2	1.2	4	5.4	1.2
PI 426625	Pakistan	5.3	0.8	11	5.2	0.8	5	5.7	0.5
PI 430615	China	3.9	1.7	5	3.2	1.9	6	4.5	1.4
PI 431579	India	4.2	1.8	12	4.6	1.5	5	3.2	2.2
PI 435085	China	5.8	1.1	9	5.9	0.9	5	5.4	1.5
PI 435282	Iraq	6.0	1.7	9	6.4	1.7	4	5.3	1.5
PI 435990	China	3.2	1.9	8	2.5	1.7	3	5.2	0.2
PI 435991	China	5.0	1.4	8	4.7	1.3	5	5.5	1.5
PI 438671	Mexico	4.5	1.2	8	4.7	1.4	5	4.2	0.6
PI 438673	Mexico	4.9	0.8	11	5.0	0.8	6	4.7	0.9
PI 438674	Mexico	5.1	1.6	12	5.2	1.4	6	5.0	2.1
PI 438675	Mexico	3.4	1.7	10	3.1	1.7	5	4.1	1.7
PI 438677	Mexico	4.3	1.4	8	4.1	1.7	6	4.5	0.9
PI 441722	Brazil	4.1	1.2	4	4.4	1.6	6	4.0	0.9
PI 442826	Brazil	4.3	1.3	7	4.7	1.2	4	3.7	1.1
PI 458738	Paraguay	5.1	1.2	8	5.5	1.1	7	4.8	1.3
PI 458739	Paraguay	5.1	1.3	9	5.0	1.6	8	5.1	1.0
PI 459074	Botswana	4.2	1.5	6	4.5	1.4	5	3.7	1.6
PI 459075	Botswana	3.6	1.7	10	3.4	1.5	5	4.0	2.1
PI 464872	China	4.3	1.2	11	4.6	0.9	5	3.8	1.8
PI 470246	Indonesia	4.3	0.7	10	4.4	0.7	6	4.2	0.8

Table 11 (Continued).

PI 470247	Indonesia	3.7	1.9	4	3.4	2.9	6	3.9	1.1
PI 470248	Indonesia	3.2	1.3	16	3.2	1.2	9	3.2	1.6
PI 470249	Indonesia	3.7	1.4	13	3.4	1.4	9	4.2	1.5
PI 475746	Paraguay	4.2	1.6	11	4.9	1.5	5	2.8	0.8
PI 476324	Soviet Union	4.6	1.6	7	4.6	1.8	1	4.3	0.0
PI 476325	Ukraine	5.1	1.0	12	5.3	0.8	4	4.5	1.4
PI 476326	Soviet Union	5.1	1.1	8	5.1	0.9	6	5.2	1.4
PI 476327	Uzbekistan	4.8	1.7	8	5.2	2.1	4	4.1	0.4
PI 476328	Soviet Union	4.5	2.0	4	4.0	1.5	3	5.1	2.7
PI 476329	Soviet Union	4.2	0.8	9	4.5	0.8	4	3.5	0.2
PI 476330	Soviet Union	5.1	1.1	11	5.2	1.2	7	5.0	0.9
PI 479704	United States	3.9	1.6	8	3.9	1.8	3	3.9	1.2
PI 481871	Sudan	3.4	1.5	9	3.2	1.5	3	4.0	1.7
PI 482246	Zimbabwe	3.5	1.1	13	3.3	1.1	11	3.8	0.9
PI 482247	Zimbabwe	4.3	1.0	11	3.9	0.9	7	4.8	0.9
PI 482249	Zimbabwe	4.0	1.0	11	3.8	1.0	4	4.5	1.2
PI 482250	Zimbabwe	4.8	1.3	11	5.3	0.8	4	3.4	1.4
PI 482251	Zimbabwe	3.7	0.9	10	4.1	0.8	7	3.1	0.6
PI 482252	Zimbabwe	3.5	1.0	12	3.4	1.0	5	3.8	1.2
PI 482253	Zimbabwe	3.8	1.2	11	3.8	1.3	7	3.9	1.2
PI 482254	Zimbabwe	4.8	0.7	8	4.6	0.8	6	5.1	0.5
PI 482255	Zimbabwe	4.0	1.3	16	3.8	1.4	7	4.3	1.1
PI 482256	Zimbabwe	4.0	1.3	12	4.3	1.3	7	3.5	1.4
PI 482257	Zimbabwe	3.1	1.5	11	2.9	1.1	7	3.5	2.0
PI 482258	Zimbabwe	3.6	1.5	10	3.6	1.8	7	3.5	1.0
PI 482259	Zimbabwe	3.9	1.5	12	4.4	1.3	6	2.8	1.3
PI 482260	Zimbabwe	3.3	1.5	14	3.4	1.4	8	3.3	1.6
PI 482261	Zimbabwe	3.7	1.0	12	3.9	0.8	7	3.3	1.1
PI 482262	Zimbabwe	4.7	0.8	11	4.5	0.6	4	5.2	1.1
PI 482263	Zimbabwe	4.7	1.0	12	4.8	1.1	6	4.4	1.0
PI 482264	Zimbabwe	4.3	0.8	10	4.3	0.6	5	4.3	1.2
PI 482265	Zimbabwe	3.7	0.8	11	3.9	0.7	7	3.5	1.1
PI 482266	Zimbabwe	3.5	1.5	9	4.2	1.7	7	2.8	0.9
PI 482267	Zimbabwe	3.2	1.5	10	3.0	1.8	6	3.3	1.0
PI 482268	Zimbabwe	3.8	1.4	13	3.8	1.4	7	3.8	1.5
PI 482269	Zimbabwe	4.0	1.4	8	3.5	1.3	5	4.6	1.3
PI 482270	Zimbabwe	4.0	1.5	11	3.8	1.5	5	4.2	1.4
PI 482271	Zimbabwe	4.3	1.3	10	4.5	1.2	1	2.0	0.0
PI 482272	Zimbabwe	3.9	2.1	11	4.0	2.1	3	3.5	2.2
PI 482273	Zimbabwe	3.7	1.6	13	3.6	1.4	12	3.7	1.8
PI 482274	Zimbabwe	3.7	1.3	11	3.7	1.5	5	3.8	1.0
PI 482275	Zimbabwe	3.8	1.4	10	4.0	1.5	5	3.5	1.4

Table 11 (Continued).

PI 482276	Zimbabwe	2.7	1.0	11	2.5	1.1	6	3.1	0.6
PI 482277	Zimbabwe	3.5	1.0	21	3.6	0.8	11	3.4	1.4
PI 482278	Zimbabwe	4.5	1.1	13	4.5	1.2	5	4.4	0.7
PI 482279	Zimbabwe	3.4	1.8	6	3.8	1.7	5	2.9	2.0
PI 482280	Zimbabwe	4.3	1.1	10	4.3	1.4	6	4.3	0.3
PI 482281	Zimbabwe	3.7	1.0	13	3.7	0.6	6	3.7	1.6
PI 482282	Zimbabwe	3.8	0.8	4	3.7	0.7	4	3.9	1.0
PI 482283	Zimbabwe	3.0	1.5	18	3.2	1.1	16	2.8	1.9
PI 482284	Zimbabwe	3.0	1.6	17	3.5	1.6	9	2.2	1.5
PI 482285	Zimbabwe	4.3	1.3	12	4.2	1.5	5	4.5	1.1
PI 482286	Zimbabwe	4.1	1.2	11	3.8	1.1	4	4.9	1.1
PI 482287	Zimbabwe	4.2	1.4	10	3.6	1.2	6	5.2	1.0
PI 482288	Zimbabwe	3.6	1.3	16	3.8	1.3	10	3.3	1.3
PI 482289	Zimbabwe	4.9	1.6	11	5.5	1.5	5	3.6	0.9
PI 482290	Zimbabwe	4.4	1.2	13	4.2	1.3	5	5.0	0.8
PI 482291	Zimbabwe	4.3	0.8	12	4.4	0.9	6	4.3	0.7
PI 482292	Zimbabwe	5.1	1.6	12	4.9	1.8	5	5.6	0.9
PI 482293	Zimbabwe	3.3	1.3	21	3.4	0.9	12	3.3	1.9
PI 482294	Zimbabwe	3.2	1.6	10	3.7	1.1	6	2.5	2.1
PI 482295	Zimbabwe	4.0	1.4	13	4.0	1.6	5	4.0	0.9
PI 482296	Zimbabwe	4.2	1.2	10	4.0	1.4	7	4.4	0.9
PI 482297	Zimbabwe	3.3	1.1	10	3.0	1.1	5	3.9	0.9
PI 482298	Zimbabwe	4.2	1.1	13	4.1	1.2	3	4.6	0.3
PI 482299	Zimbabwe	3.8	1.7	10	4.1	1.6	8	3.4	1.8
PI 482300	Zimbabwe	3.8	1.7	15	3.8	1.7	13	3.9	1.8
PI 482301	Zimbabwe	4.3	0.8	12	4.5	0.8	6	4.1	0.9
PI 482302	Zimbabwe	3.5	1.5	13	3.4	1.4	10	3.7	1.5
PI 482303	Zimbabwe	4.0	1.2	13	4.1	1.1	5	3.7	1.3
PI 482304	Zimbabwe	4.2	1.3	12	3.7	1.2	7	5.0	1.4
PI 482305	Zimbabwe	3.8	1.0	12	3.8	0.7	6	3.7	1.5
PI 482306	Zimbabwe	4.2	1.1	12	4.3	1.2	6	4.1	0.8
PI 482307	Zimbabwe	3.3	1.0	11	3.1	1.0	5	3.9	0.8
PI 482308	Zimbabwe	4.1	1.6	13	4.6	1.2	8	3.4	1.9
PI 482309	Zimbabwe	3.7	1.4	12	4.1	0.9	5	2.8	2.0
PI 482310	Zimbabwe	3.5	1.3	10	3.3	1.5	4	3.9	0.8
PI 482311	Zimbabwe	4.2	1.0	10	4.5	1.0	7	3.8	0.8
PI 482312	Zimbabwe	3.6	1.6	10	3.8	2.0	6	3.3	0.7
PI 482313	Zimbabwe	4.2	1.2	11	4.2	1.3	7	4.2	1.1
PI 482314	Zimbabwe	4.9	1.9	11	5.3	1.6	7	4.4	2.4
PI 482315	Zimbabwe	3.0	1.3	11	3.2	0.9	8	2.8	1.7
PI 482316	Zimbabwe	3.5	1.6	12	3.6	1.5	8	3.3	1.9
PI 482317	Zimbabwe	4.7	1.3	9	5.3	0.9	6	3.8	1.4

Table 11 (Continued).

PI 482318	Zimbabwe	4.1	0.7	12	4.1	0.8	5	4.1	0.6
PI 482319	Zimbabwe	3.5	1.7	11	4.0	0.8	6	2.6	2.6
PI 482320	Zimbabwe	3.6	1.7	13	3.2	1.7	6	4.6	1.6
PI 482321	Zimbabwe	3.9	1.3	11	4.4	1.0	6	3.0	1.5
PI 482322	Zimbabwe	5.2	1.5	11	5.9	1.5	7	4.1	0.7
PI 482323	Zimbabwe	3.7	1.2	11	3.6	1.3	3	4.3	1.0
PI 482324	Zimbabwe	4.1	1.3	11	4.3	1.3	4	3.3	0.8
PI 482325	Zimbabwe	4.4	1.1	9	4.5	1.1	3	3.9	1.0
PI 482326	Zimbabwe	3.3	1.4	11	3.8	1.3	7	2.7	1.5
PI 482327	Zimbabwe	5.6	0.9	11	5.5	0.9	5	5.8	0.9
PI 482328	Zimbabwe	4.4	0.9	10	4.3	1.1	6	4.4	0.4
PI 482329	Zimbabwe	4.5	1.7	11	4.2	1.7	4	5.1	1.5
PI 482331	Zimbabwe	3.8	1.2	11	4.2	1.0	2	1.9	0.4
PI 482333	Zimbabwe	4.0	1.5	8	4.7	1.3	5	2.8	0.9
PI 482334	Zimbabwe	4.1	1.6	13	4.1	1.7	2	4.6	1.6
PI 482335	Zimbabwe	3.4	1.2	19	3.6	1.0	10	3.2	1.7
PI 482336	Zimbabwe	3.4	1.4	12	3.8	1.3	10	2.9	1.5
PI 482337	Zimbabwe	4.0	1.6	13	4.2	2.0	7	3.8	0.3
PI 482338	Zimbabwe	3.8	1.1	17	3.6	1.3	14	4.0	1.0
PI 482339	Zimbabwe	4.3	1.4	12	4.5	1.5	6	4.0	1.3
PI 482340	Zimbabwe	4.1	0.9	12	4.2	1.0	8	4.0	0.8
PI 482341	Zimbabwe	3.6	0.8	11	3.6	0.9	5	3.5	0.5
PI 482342	Zimbabwe	3.2	1.1	21	3.2	0.9	12	3.2	1.4
PI 482343	Zimbabwe	3.3	0.9	11	3.3	0.7	6	3.4	1.2
PI 482344	Zimbabwe	4.1	1.5	12	3.9	1.5	5	4.5	1.5
PI 482345	Zimbabwe	3.9	0.9	11	4.0	1.0	3	3.4	0.2
PI 482346	Zimbabwe	3.6	1.2	11	3.3	1.3	4	4.4	0.6
PI 482349	Zimbabwe	5.1	1.2	12	5.0	0.9	6	5.1	1.8
PI 482350	Zimbabwe	4.4	1.1	10	4.7	1.1	5	3.9	1.1
PI 482354	Zimbabwe	4.3	1.6	26	4.2	1.5	4	4.7	2.0
PI 482357	Zimbabwe	3.3	1.5	10	2.4	0.7	7	4.5	1.6
PI 482360	Zimbabwe	3.6	1.6	11	3.6	1.7	6	3.4	1.6
PI 482371	Zimbabwe	4.6	1.4	12	5.3	0.5	7	3.3	1.4
PI 482374	Zimbabwe	3.3	1.3	21	3.1	1.1	10	3.8	1.6
PI 482375	Zimbabwe	3.5	0.8	11	3.4	0.6	6	3.9	1.0
PI 482376	Zimbabwe	4.3	1.0	12	4.5	0.8	4	3.8	1.3
PI 482378	Zimbabwe	3.4	1.2	10	3.1	1.1	4	4.1	1.1
PI 482379	Zimbabwe	2.6	0.9	8	2.6	0.5	7	2.6	1.2
PI 482380	Zimbabwe	4.3	2.0	12	5.0	1.3	7	3.0	2.4
PI 485583	Botswana	3.7	1.3	10	3.7	1.2	5	3.7	1.5
PI 487458	Venezuela	5.0	1.1	11	4.7	1.0	7	5.4	1.2
PI 487459	Venezuela	4.7	1.0	10	4.6	1.2	7	4.9	0.7

Table 11 (Continued).

PI 487476	Israel	4.9	1.6	10	4.8	1.9	6	5.1	1.1
PI 490375	Mali	3.0	1.6	7	2.8	1.9	5	3.2	1.1
PI 490376	Mali	3.3	1.1	9	3.3	1.2	1	2.7	0.0
PI 490377	Mali	3.7	1.8	6	3.5	1.9	5	4.0	1.7
PI 490378	Mali	3.6	1.4	8	3.2	1.4	5	4.1	1.2
PI 490379	Mali	3.9	1.9	6	4.8	2.0	4	2.7	0.8
PI 490380	Mali	3.7	1.3	9	3.7	1.3	5	3.6	1.4
PI 490381	Mali	4.1	1.4	22	4.1	1.4	6	4.4	1.7
PI 490382	Mali	3.7	1.2	8	3.3	0.8	4	4.5	1.5
PI 490383	Mali	2.9	1.5	13	3.4	1.0	5	1.6	2.0
PI 490384	Mali	3.1	1.4	8	2.7	1.0	4	3.9	1.8
PI 490385	Mali	4.2	1.2	14	4.0	1.2	4	4.8	0.9
PI 490386	Mali	4.4	1.3	10	4.5	1.4	6	4.3	1.4
PI 491265	Zimbabwe	4.4	1.5	12	4.5	1.6	7	4.2	1.4
PI 494527	Nigeria	4.0	1.5	8	4.7	0.9	6	2.9	1.5
PI 494529	Nigeria	4.2	1.4	20	4.4	1.5	9	3.9	1.1
PI 494530	Nigeria	4.7	1.6	5	5.1	1.8	4	4.2	1.2
PI 494531	Nigeria	3.7	1.6	25	3.1	1.6	12	4.8	0.9
PI 494532	Nigeria	3.4	1.8	13	3.5	2.0	2	2.7	0.1
PI 494815	Zambia	4.3	1.5	12	3.9	1.5	4	5.5	0.9
PI 494816	Zambia	3.9	1.1	9	3.8	1.2	5	4.0	0.9
PI 494819	Zambia	4.5	1.6	12	4.3	1.8	5	5.0	0.8
PI 494820	Zambia	4.1	1.3	10	3.3	0.7	6	5.4	0.9
PI 494821	Zambia	3.5	1.3	9	3.5	1.8	8	3.5	0.7
PI 500301	Zambia	3.6	1.4	10	3.1	0.9	5	4.7	1.8
PI 500302	Zambia	3.5	1.5	8	3.0	1.4	3	4.7	0.7
PI 500304	Zambia	3.8	1.3	19	3.5	1.1	11	4.3	1.4
PI 500305	Zambia	4.0	1.2	12	3.7	1.2	5	4.5	0.8
PI 500306	Zambia	4.6	1.6	11	4.3	1.9	6	5.1	0.9
PI 500307	Zambia	4.5	1.3	9	4.4	1.3	5	4.8	1.5
PI 500309	Zambia	4.4	1.1	12	4.6	1.1	5	4.1	1.2
PI 500310	Zambia	4.6	1.2	12	4.3	1.2	8	5.0	1.1
PI 500311	Zambia	4.3	1.4	4	4.8	2.2	6	4.0	0.5
PI 500312	Zambia	3.1	1.1	11	3.6	1.0	7	2.3	0.7
PI 500313	Zambia	4.0	1.1	16	4.1	1.2	8	3.8	0.9
PI 500314	Zambia	4.3	0.8	5	4.4	1.1	6	4.2	0.7
PI 500315	Zambia	3.8	1.4	9	3.3	1.5	6	4.5	1.0
PI 500316	Zambia	4.1	1.3	13	3.8	1.4	6	4.8	0.7
PI 500317	Zambia	4.0	1.3	10	3.9	1.3	7	4.2	1.4
PI 500318	Zambia	3.9	0.8	10	4.1	0.8	7	3.7	0.8
PI 500319	Zambia	4.8	1.4	9	4.5	1.7	6	5.3	1.0
PI 500320	Zambia	4.1	1.3	7	4.2	1.2	3	3.9	1.8

Table 11 (Continued).

PI 500321	Zambia	5.5	1.3	10	5.9	1.0	2	3.5	1.3
PI 500323	Zambia	3.3	1.7	12	3.2	1.9	5	3.4	1.3
PI 500324	Zambia	3.4	1.3	11	2.7	0.9	6	4.6	1.2
PI 500327	Zambia	3.8	1.4	12	4.3	1.2	6	2.7	1.2
PI 500328	Zambia	4.7	0.8	13	4.6	0.9	6	4.8	0.3
PI 500329	Zambia	4.2	1.4	11	4.5	1.1	7	3.8	1.9
PI 500331	Zambia	3.8	0.7	13	3.8	0.7	7	3.8	0.7
PI 500332	Zambia	3.4	1.4	15	3.3	1.4	6	3.7	1.5
PI 500334	Zambia	3.8	1.1	21	3.9	1.2	15	3.6	0.9
PI 500335	Zambia	4.2	1.3	20	4.3	1.5	15	4.1	0.9
PI 500336	Zambia	3.8	1.6	15	3.2	1.5	7	5.2	0.5
PI 500337	Zambia	4.8	1.6	8	4.0	1.4	6	5.7	1.5
PI 500338	Zambia	4.6	1.4	10	4.1	1.5	6	5.3	0.8
PI 500340	Zambia	3.5	1.3	6	3.6	1.5	2	3.3	0.8
PI 500341	Zambia	4.4	2.1	9	3.9	2.1	5	5.3	1.9
PI 500344	Zambia	4.0	1.2	10	3.7	1.3	5	4.7	0.7
PI 500345	Zambia	3.8	1.3	6	3.1	0.6	3	5.2	1.4
PI 500348	Zambia	4.2	1.8	20	4.0	2.0	8	4.8	1.0
PI 500352	Zambia	4.5	1.7	7	4.6	1.7	3	4.3	2.0
PI 500353	Zambia	5.0	1.3	12	5.1	1.4	6	4.9	1.3
PI 502315	Ukraine	4.2	1.6	15	4.1	1.9	8	4.3	0.8
PI 502316	Uzbekistan	5.0	1.0	7	4.8	1.1	5	5.2	0.8
PI 502317	Uzbekistan	4.7	2.7	3	2.6	3.1	5	5.9	1.6
PI 502318	Uzbekistan	5.3	0.8	6	5.3	0.9	3	5.3	0.4
PI 502319	Uzbekistan	3.5	1.5	6	3.5	1.0	4	3.5	2.2
PI 504519	Australia	4.0	1.9	15	3.6	1.9	6	5.1	1.5
PI 505584	Zambia	4.2	1.0	10	4.1	1.2	7	4.4	0.6
PI 505585	Zambia	4.3	1.0	11	4.1	1.1	6	4.7	0.7
PI 505586	Zambia	4.2	1.3	16	4.2	1.5	8	4.2	0.4
PI 505587	Zambia	3.6	1.6	11	3.8	1.3	7	3.4	2.0
PI 505588	Zambia	4.2	0.9	10	4.2	0.7	8	4.3	1.1
PI 505589	Zambia	4.8	0.8	11	5.0	0.9	7	4.5	0.7
PI 505591	Zambia	4.7	1.6	12	5.4	0.9	4	2.6	0.9
PI 505592	Zambia	5.1	1.5	12	5.3	1.8	8	4.9	0.7
PI 505593	Zambia	3.6	1.0	14	3.6	1.2	11	3.7	0.7
PI 505594	Zambia	4.6	1.6	12	4.8	1.5	4	3.9	1.7
PI 505595	Zambia	4.4	1.6	10	4.4	1.7	8	4.4	1.6
PI 505604	Zambia	3.9	1.0	9	3.8	1.1	6	3.9	1.0
PI 506439	Moldova	4.3	1.4	11	4.5	1.2	5	4.0	1.9
PI 507858	Hungary	4.4	1.8	8	3.9	2.5	7	4.9	0.3
PI 507859	Hungary	4.5	1.3	24	4.5	1.1	13	4.6	1.7
PI 507860	Hungary	5.4	0.9	12	5.4	1.0	5	5.6	0.9

Table 11 (Continued).

PI 507861	Hungary	4.9	1.7	11	4.0	1.1	7	6.2	1.5
PI 507862	Hungary	5.5	1.6	10	5.1	1.8	6	6.1	1.0
PI 507863	Hungary	4.5	1.1	11	4.4	1.3	5	4.7	0.7
PI 507864	Hungary	3.8	1.6	5	3.8	2.3	5	3.9	0.8
PI 507865	Hungary	4.0	1.5	11	4.1	1.6	3	3.7	0.8
PI 507866	Hungary	4.2	2.0	9	4.4	1.5	5	3.9	2.8
PI 507867	Hungary	3.6	1.0	7	3.2	1.3	6	4.0	0.4
PI 507868	Hungary	3.8	1.7	9	4.1	1.6	6	3.2	1.8
PI 507869	Hungary	3.5	1.5	19	3.4	1.6	6	3.8	1.3
PI 508441	Korea	3.8	1.2	12	3.3	1.1	7	4.6	0.9
PI 508442	Korea	4.7	1.7	10	4.4	1.3	7	5.2	2.1
PI 508443	Korea	3.1	1.6	7	3.2	1.5	4	3.0	1.8
PI 508444	Korea	4.2	1.3	10	4.1	1.4	3	4.7	0.5
PI 508445	Korea	3.8	1.0	8	3.6	1.2	6	4.0	0.7
PI 508446	Korea	4.3	0.7	12	4.4	0.7	3	4.2	0.6
PI 512332	China	3.9	1.5	9	3.8	1.8	5	4.2	0.9
PI 512339	Spain	5.2	0.7	8	4.9	0.7	5	5.6	0.6
PI 512340	Spain	4.2	1.0	7	3.8	1.1	6	4.6	0.5
PI 512341	Spain	4.8	1.3	11	4.5	1.2	7	5.2	1.3
PI 512342	Spain	4.4	1.4	11	4.2	1.6	7	4.6	1.1
PI 512343	Spain	3.4	1.1	7	3.6	1.4	7	3.3	0.7
PI 512344	Spain	4.8	1.5	3	4.2	1.1	4	5.3	1.6
PI 512345	Spain	4.7	1.2	22	4.5	1.0	12	5.2	1.3
PI 512347	Spain	4.3	0.9	7	4.3	0.6	4	4.2	1.4
PI 512348	Spain	5.0	1.5	10	5.5	1.0	4	3.7	1.8
PI 512349	Spain	3.4	1.5	9	2.9	1.5	5	4.3	1.1
PI 512350	Spain	4.5	1.5	20	4.4	1.3	10	4.7	1.9
PI 512351	Spain	5.3	0.9	11	5.3	1.0	2	5.5	0.7
PI 512352	Spain	5.3	1.2	10	5.7	0.9	4	4.4	1.5
PI 512353	Spain	4.8	0.8	9	4.8	0.8	2	4.9	1.5
PI 512354	Spain	4.9	1.7	6	4.6	1.9	3	5.5	1.1
PI 512355	Spain	4.9	1.4	21	5.3	1.2	14	4.4	1.6
PI 512356	Spain	4.5	1.1	11	4.1	1.1	6	5.1	0.8
PI 512358	Spain	4.9	1.5	19	5.6	1.2	13	3.8	1.0
PI 512359	Spain	4.8	1.0	4	5.5	0.8	6	4.4	1.1
PI 512360	Spain	4.5	1.3	18	4.5	1.4	6	4.4	1.2
PI 512361	Spain	3.2	1.1	9	2.8	0.8	4	4.1	1.4
PI 512362	Spain	4.3	1.4	8	4.2	1.5	2	4.8	0.5
PI 512363	Spain	4.8	1.0	7	5.4	1.0	5	4.1	0.4
PI 512364	Spain	4.9	1.2	20	5.1	1.2	9	4.5	1.0
PI 512365	Spain	5.5	1.2	9	6.0	0.6	4	4.3	1.4
PI 512366	Spain	4.9	1.6	4	4.2	1.1	3	6.0	1.8

Table 11 (Continued).

PI 512367	Spain	4.2	1.1	19	4.2	1.2	8	4.2	1.1
PI 512368	Spain	4.9	1.0	9	4.8	1.1	5	5.0	1.0
PI 512369	Spain	5.8	2.0	6	5.3	0.5	3	6.9	3.6
PI 512370	Spain	4.5	1.2	11	4.2	1.2	6	5.0	1.3
PI 512371	Spain	4.7	1.6	20	4.3	1.4	13	5.3	1.7
PI 512373	Spain	6.0	1.0	18	6.4	0.9	11	5.5	0.8
PI 512374	Spain	4.6	1.6	9	4.3	1.7	3	5.5	1.1
PI 512376	Spain	4.3	1.3	11	4.9	1.1	5	3.1	0.8
PI 512378	Spain	4.8	1.4	9	5.1	1.3	4	4.1	1.5
PI 512379	Spain	4.0	1.4	5	4.7	1.2	4	3.0	1.1
PI 512381	Spain	4.5	1.4	5	3.8	1.6	4	5.5	0.5
PI 512382	Spain	5.3	1.1	11	4.7	0.7	6	6.3	0.8
PI 512383	Spain	4.4	1.4	9	4.9	1.7	7	3.8	0.7
PI 512384	Spain	4.9	1.4	11	5.3	1.3	4	4.0	1.6
PI 512385	Spain	3.9	1.6	15	4.0	1.3	12	3.8	2.0
PI 512386	Spain	4.7	1.1	13	4.7	1.1	4	4.7	1.3
PI 512387	Spain	4.6	0.7	10	4.5	0.8	7	4.7	0.8
PI 512388	Spain	3.1	0.9	9	2.8	0.8	6	3.7	0.8
PI 512389	Spain	4.5	0.9	8	4.5	1.0	3	4.3	0.6
PI 512390	Spain	4.6	1.3	7	4.0	1.2	5	5.5	0.9
PI 512391	Spain	5.3	1.0	10	5.2	1.3	5	5.5	0.4
PI 512392	Spain	4.4	1.5	7	4.3	1.3	6	4.4	1.7
PI 512393	Spain	4.0	1.5	6	3.4	1.3	3	5.3	0.6
PI 512394	Spain	4.5	1.1	12	4.1	1.0	6	5.1	0.9
PI 512395	Spain	3.9	0.8	10	3.9	0.8	6	3.9	0.9
PI 512396	Spain	4.0	0.8	12	3.9	0.7	4	4.4	1.1
PI 512397	Spain	4.9	1.7	8	5.1	1.9	3	4.3	1.3
PI 512398	Spain	3.0	0.8	9	3.1	0.8	3	2.8	0.7
PI 512399	Spain	5.7	1.1	12	5.3	1.0	5	6.6	0.8
PI 512400	Spain	3.7	1.6	11	3.1	1.1	7	4.7	2.0
PI 512401	Spain	4.3	1.2	9	4.4	1.3	5	4.0	1.1
PI 512402	Spain	5.4	1.4	7	5.2	1.8	4	5.7	0.8
PI 512403	Spain	4.7	1.7	13	5.1	1.2	6	3.8	2.3
PI 512404	Spain	3.8	1.2	8	3.5	0.9	2	4.8	2.3
PI 512405	Spain	4.3	1.5	12	4.2	1.7	5	4.7	1.2
PI 512406	Spain	4.5	0.9	26	4.4	0.8	11	4.8	1.0
PI 512407	Spain	4.2	1.1	8	4.1	0.8	5	4.3	1.7
PI 512828	Spain	5.6	1.3	8	5.7	0.7	3	5.4	2.5
PI 512833	Spain	5.2	0.9	20	5.2	0.9	6	5.5	0.8
PI 518606	Soviet Union	4.7	1.1	10	4.5	1.2	5	5.1	0.8
PI 518611	Soviet Union	4.9	1.4	12	5.1	1.5	5	4.5	1.3
PI 519612	Soviet Union	4.3	1.3	8	4.1	1.3	4	4.6	1.3

Table 11 (Continued).

PI 525081	Egypt	4.3	2.0	13	4.9	2.0	6	3.0	1.6
PI 525084	Egypt	6.1	0.9	10	6.0	1.0	3	6.6	0.2
PI 525086	Egypt	5.7	1.3	12	5.5	1.0	7	6.1	1.7
PI 525087	Egypt	6.0	0.9	10	5.9	0.7	4	6.3	1.3
PI 525088	Egypt	5.3	1.3	6	4.6	1.2	8	5.8	1.1
PI 525089	Egypt	5.4	1.6	8	5.1	1.8	3	6.2	0.4
PI 525090	Egypt	4.8	1.5	4	4.6	1.4	4	5.0	1.8
PI 525091	Egypt	6.0	1.0	10	5.7	0.8	7	6.4	1.1
PI 525094	Egypt	5.5	1.3	13	6.1	0.9	5	4.0	0.9
PI 525095	Egypt	4.3	1.6	11	3.8	1.4	5	5.3	1.7
PI 525096	Egypt	4.4	1.5	5	3.6	1.2	5	5.3	1.4
PI 525097	Egypt	5.2	1.5	9	5.6	1.7	4	4.3	0.6
PI 525098	Egypt	5.3	1.5	12	5.2	1.7	6	5.7	1.1
PI 525099	Italy	4.9	1.1	8	4.3	0.7	5	5.8	0.8
PI 525100	Italy	5.0	1.4	10	4.5	1.1	7	5.7	1.5
PI 526231	Zimbabwe	3.7	1.3	9	3.2	1.3	6	4.6	1.0
PI 526232	Zimbabwe	5.0	1.1	12	5.4	0.7	7	4.3	1.4
PI 526233	Zimbabwe	2.7	1.1	10	2.4	0.8	2	4.2	1.1
PI 526234	Zimbabwe	4.2	1.1	10	4.0	1.2	7	4.6	0.8
PI 526235	Zimbabwe	4.2	1.3	11	4.6	1.3	7	3.6	1.0
PI 526236	Zimbabwe	4.0	1.2	12	4.0	1.3	6	4.0	1.3
PI 526237	Zimbabwe	4.7	1.1	12	4.8	1.4	7	4.6	0.7
PI 526238	Zimbabwe	4.2	1.3	13	4.5	1.1	7	3.6	1.6
PI 526239	Zimbabwe	3.9	1.3	9	3.5	0.8	4	4.7	1.8
PI 532624	Zimbabwe	4.0	0.9	11	3.6	0.7	6	4.7	0.8
PI 532659	South Africa	3.6	1.8	14	3.4	1.5	8	4.0	2.3
PI 532664	Swaziland	4.1	1.7	5	5.3	2.1	6	3.2	0.5
PI 532666	Swaziland	3.0	1.3	2	3.7	0.2	5	2.7	1.5
PI 532667	Swaziland	5.1	1.3	15	5.5	0.8	10	4.4	1.6
PI 532668	Swaziland	4.5	1.2	21	5.0	0.9	12	3.6	1.2
PI 532669	Botswana	3.6	0.8	6	3.5	1.0	5	3.6	0.7
PI 532670	Botswana	3.6	1.0	11	3.4	1.1	5	3.9	1.0
PI 532809	China	3.7	1.4	13	3.5	1.7	9	3.9	0.8
PI 532810	China	5.4	1.4	12	5.4	1.3	5	5.3	1.6
PI 532813	China	4.7	1.2	11	4.7	1.2	6	4.8	1.3
PI 532814	China	4.1	1.6	12	4.3	1.8	4	3.6	0.6
PI 532816	China	5.1	1.5	10	5.0	0.8	5	5.1	2.5
PI 532817	China	5.0	1.3	11	4.7	1.4	5	5.8	1.0
PI 532818	China	5.5	1.3	10	5.2	1.4	5	6.0	0.7
PI 534531	Syria	4.0	1.9	7	4.0	2.1	6	4.0	1.9
PI 534532	Syria	5.2	1.2	24	5.5	1.0	13	4.6	1.3
PI 534533	Syria	5.5	1.2	6	6.0	0.8	5	5.0	1.4

Table 11 (Continued).

PI 534534	Syria	5.7	1.0	10	5.9	1.2	5	5.4	0.8
PI 534535	Syria	4.8	1.5	9	4.9	1.6	4	4.6	1.3
PI 534583	Syria	4.4	1.8	7	4.2	2.4	6	4.7	0.5
PI 534584	Syria	4.8	0.9	10	4.8	1.0	5	5.0	0.7
PI 534585	Syria	5.0	0.9	10	5.3	0.6	4	4.3	1.1
PI 534586	Syria	4.9	1.9	9	5.1	2.1	6	4.6	1.7
PI 534587	Syria	4.0	1.1	10	3.8	1.3	5	4.3	0.5
PI 534588	Syria	4.9	1.2	5	5.0	1.6	5	4.7	0.5
PI 534589	Syria	4.8	1.1	9	4.9	1.2	6	4.8	1.0
PI 534590	Syria	4.9	1.8	24	5.5	1.4	10	3.4	1.7
PI 534591	Syria	3.6	0.9	5	3.2	0.8	5	4.0	0.8
PI 534592	Syria	5.4	1.2	9	4.9	1.1	4	6.4	0.7
PI 534593	Syria	5.8	1.2	8	6.0	1.2	7	5.6	1.3
PI 534594	Syria	4.3	1.1	21	4.4	1.3	16	4.2	0.9
PI 534595	Syria	4.1	1.2	5	4.1	1.5	3	4.1	0.6
PI 534596	Syria	4.2	1.2	8	4.1	1.2	5	4.3	1.4
PI 534597	Syria	6.1	1.0	6	6.0	1.1	6	6.2	1.0
PI 534598	Syria	5.5	0.9	9	5.7	0.8	7	5.1	1.1
PI 534599	Syria	5.6	1.2	4	5.3	1.3	4	5.8	1.2
PI 535947	Cameroon	4.2	1.7	20	3.7	1.9	15	4.9	1.2
PI 535948	Cameroon	4.0	1.6	10	4.3	1.4	8	3.6	1.8
PI 536448	Maldives	4.0	1.3	10	3.4	1.7	12	4.5	0.6
PI 536449	Maldives	4.3	1.1	11	4.2	1.1	5	4.5	0.9
PI 536450	Maldives	5.2	1.0	9	5.2	1.3	6	5.1	0.4
PI 536451	Maldives	5.2	2.4	8	4.6	2.3	6	6.0	2.5
PI 536452	Maldives	5.3	1.0	12	4.8	0.9	7	6.2	0.6
PI 536453	Maldives	4.8	1.5	12	4.3	1.3	4	6.3	1.0
PI 536457	Maldives	5.2	1.5	10	4.4	1.0	7	6.5	1.1
PI 536458	Maldives	5.0	1.9	9	4.0	1.4	5	6.7	1.1
PI 536459	Maldives	5.3	1.4	10	4.5	1.0	5	6.8	0.8
PI 536460	Maldives	5.9	1.2	11	5.5	0.8	3	7.6	0.5
PI 536462	Maldives	5.2	1.2	12	4.8	0.8	6	6.0	1.4
PI 536463	Maldives	5.1	1.9	25	4.5	1.5	7	7.4	1.3
PI 536464	Maldives	5.8	1.6	10	5.3	1.8	6	6.5	1.0
PI 537265	Pakistan	5.3	0.8	11	5.5	0.9	6	4.8	0.3
PI 537266	Pakistan	4.4	1.3	12	4.2	1.0	6	4.7	2.0
PI 537270	Pakistan	4.6	1.2	10	4.8	1.3	6	4.2	0.9
PI 537271	Pakistan	4.7	1.3	11	4.3	1.1	6	5.3	1.5
PI 537273	Pakistan	4.8	1.1	9	4.9	1.1	6	4.6	1.1
PI 537299	Uzbekistan	4.1	1.2	10	3.6	0.9	5	5.3	0.6
PI 537461	Spain	5.1	1.3	24	4.9	1.3	12	5.4	1.3
PI 537465	Spain	5.8	1.0	12	6.1	1.0	4	4.8	0.4

Table 11 (Continued).

PI 537467	Spain	3.7	1.0	11	3.8	1.1	3	3.2	0.6
PI 537468	Spain	5.0	0.9	9	5.1	0.8	5	4.8	1.1
PI 537470	Spain	4.3	1.2	8	4.1	1.3	3	5.0	0.2
PI 537471	Spain	3.8	1.6	7	3.1	1.5	6	4.6	1.4
PI 542114	Botswana	3.1	1.3	11	3.2	1.3	3	3.1	1.6
PI 542123	Botswana	3.2	1.4	17	2.9	1.5	5	4.1	0.9
PI 542617	Algeria	4.4	1.7	7	3.0	1.2	7	5.8	0.6
PI 543212	Bolivia	4.1	1.4	14	4.2	1.6	8	3.9	1.0
PI 549159	Mauritnia	3.8	0.9	11	4.0	1.1	6	3.5	0.5
PI 549160	Chad	3.4	2.7	5	2.3	3.2	4	4.7	1.3
PI 556994	United States	3.9	1.6	24	4.3	1.6	11	3.2	1.2
PI 556995	United States	4.2	1.9	10	3.4	2.0	6	5.5	0.7
PI 559992	Nigeria	3.5	0.8	11	3.7	0.7	6	3.0	0.5
PI 559993	Nigeria	3.4	0.9	9	3.3	0.9	4	3.6	1.1
PI 559994	Nigeria	3.5	1.2	7	3.8	0.9	3	2.8	1.9
PI 559995	Nigeria	3.8	1.7	11	3.5	1.7	6	4.3	1.7
PI 559996	Nigeria	3.9	1.3	5	4.0	1.0	8	3.8	1.5
PI 559999	Nigeria	3.8	1.0	12	3.6	0.8	5	4.4	1.2
PI 560006	Nigeria	4.4	1.9	8	4.1	1.8	5	4.9	2.3
PI 560016	Nigeria	3.6	1.2	11	3.1	1.3	7	4.4	0.4
PI 560901	China	4.1	1.0	7	4.0	1.3	4	4.4	0.5
PI 561138	United States	4.4	1.5	11	3.9	1.3	3	6.3	0.5
PI 595200	United States	4.6	1.8	7	4.7	1.5	5	4.4	2.3
PI 595202	United States	5.2	1.1	12	5.1	1.2	5	5.4	0.7
PI 595203	United States	5.7	1.1	10	6.1	1.1	6	4.9	0.6
PI 595218	United States	4.2	1.2	10	4.1	1.4	7	4.3	1.1
PI 595219	United States	4.5	1.4	17	4.4	1.6	6	5.0	0.9
Watermelon checks									
Allsweet	Univ. of Kansas	3.4	2.1	19	3.4	2.3	8	3.4	1.5
AU-Golden Producer	Auburn Univ.	4.1	1.1	10	3.8	1.0	8	4.4	1.1
AU-Jubilant	Auburn Univ.	4.2	1.5	9	4.1	1.2	9	4.3	1.8
AU-Producer	Auburn Univ.	5.0	1.6	10	5.0	1.9	10	5.0	1.2
AU-Sweet Scarlet	Auburn Univ.	5.1	1.7	10	5.6	2.0	9	4.5	1.2
Black Diamond	Watson Seeds	4.5	1.7	15	4.6	1.9	4	4.5	1.1
Black Diamond Y.F.	Unknown	4.4	1.6	13	4.3	1.7	6	4.6	1.4
Blackstone	USDA-ARS	4.4	1.0	19	4.5	0.9	11	4.0	1.1
Calhoun Gray	Louisiana St. U.	4.1	1.2	19	4.5	1.2	13	3.5	1.1
Calsweet	Mr. Layton	3.7	1.5	19	3.7	1.5	9	3.6	1.7
Charleston Gray	USDA-ARS	5.0	1.4	41	5.4	1.5	24	4.4	1.1
Congo	USDA-ARS	4.7	1.7	28	4.9	1.7	17	4.5	1.7
Crimson Sweet	Univ. of Kansas	4.1	1.1	17	3.8	1.1	10	4.5	0.8

Table 11 (Continued).

C. of Saskatchewan	Unknown	3.3	1.4	15	3.0	1.3	3	4.7	1.0
Dixielee	Univ. of Florida	3.5	0.9	19	3.6	1.0	10	3.3	0.9
Early Canada	Unknown	5.6	0.2	4	5.6	0.2	0	0.0	0.0
Fairfax	USDA-ARS	4.7	1.0	9	4.7	1.2	7	4.8	0.8
Florida Favorite	Unknown	4.9	1.4	16	5.4	1.0	6	3.4	1.2
Garrisonian	USDA-ARS	3.9	1.3	12	4.1	1.7	10	3.7	0.9
Golden Honey	Robson Seeds	5.5	1.4	20	5.4	1.2	6	6.2	1.7
Graybelle	Robson Seeds	3.7	0.9	20	3.6	0.8	4	4.1	1.5
Jubilee	Univ. of Florida	4.1	1.2	18	3.8	1.2	9	4.7	1.2
King & Queen	Unknown	4.8	1.1	17	4.9	1.2	10	4.7	1.0
Kleckley Sweet	W.A. Kleckley	4.1	1.9	18	3.9	2.0	3	4.9	0.9
Klondike Stripe 11	Unknown	4.8	1.2	12	4.7	1.4	5	5.1	0.5
Mickylee	Univ. of Florida	3.1	1.0	16	3.2	0.8	10	2.9	1.3
Minilee	Univ. of Florida	3.9	1.2	18	3.6	0.9	9	4.4	1.6
Navajo Sweet	Unknown	3.7	1.5	18	3.2	1.4	7	4.8	1.2
N.H. Midget	Univ. of N.Hamp.	4.9	1.1	13	5.1	1.2	5	4.4	0.3
Peacock Shipper	R. Peacock	4.3	1.3	19	3.9	1.4	7	5.3	0.5
Peacock Striped	R. Peacock	4.4	1.4	20	4.3	1.1	6	4.6	2.2
Peacock WR60	R. Peacock	3.5	1.6	8	3.1	1.4	6	4.0	1.9
Petite Sweet	Univ. of Kansas	3.7	1.1	10	3.5	1.1	2	4.4	1.1
Red'N'Sweet	Calhoun Res. St.	5.1	1.6	20	4.9	1.8	7	5.5	0.6
Regency	Petoseed	4.1	1.2	20	4.1	0.9	12	4.1	1.6
Smokylee	Univ. of Florida	5.5	1.8	4	5.1	1.4	2	6.2	3.0
Starbrite	Seminis V. S.	4.0	1.4	20	4.3	1.0	13	3.6	1.9
Stars'N'Stripes	Seminis V. S.	4.2	1.4	20	4.3	1.5	13	4.1	1.4
Sugar Baby	M. Hardin	4.8	1.2	20	5.1	1.1	8	3.9	1.1
Summer Gold	Abbott & Cobb	4.5	1.2	17	4.6	1.0	8	4.3	1.7
Super Gold	Abbott & Cobb	4.3	1.6	9	5.0	1.0	6	3.2	1.7
Super Sweet	Univ. of Kansas	5.6	0.7	6	5.6	0.7	0	0.0	0.0
Sweet Princess	N.C. State Univ.	5.9	0.5	4	5.9	0.5	0	0.0	0.0
Tastigold	Unknown	3.5	1.3	18	3.8	1.1	10	3.2	1.7
Tendergold	Unknown	5.0	0.9	19	5.1	0.8	8	5.0	1.1
Tendersweet O.F.	Unknown	3.6	1.1	17	3.7	1.0	6	3.5	1.5
Verona	Miss. State Univ.	4.9	1.2	4	4.9	1.2	0	0.0	0.0
Yellow Baby	Unknown	4.0	1.2	17	4.0	1.0	6	4.1	1.8
Yellow Crimson	Unknown	4.7	1.3	18	5.0	1.1	12	4.2	1.3
Yellow Rose	Syngenta Seeds	3.7	1.3	20	3.9	1.3	14	3.3	1.3
Yellow Shipper	Willhite	4.2	1.2	14	3.8	1.3	11	4.6	1.0

Table 11 (Continued).

Cucumber checks									
Clinton	N.C. State Univ.	3.4	1.7	13	3.5	1.1	9	3.2	2.5
Homegreen 2	Univ. of Wiscon.	1.5	2.1	4	2.0	0.9	5	1.1	2.7
MM 76	Cornell Univ.	3.2	2.3	15	3.6	1.6	9	2.6	3.2
NCSU M-17	N.C. State Univ.	4.4	1.5	7	4.1	0.5	8	4.6	2.0
Poinsett 76	Cornell Univ.	4.1	1.6	20	4.3	1.2	11	3.7	2.1
Slice	Clemson Univ.	3.0	1.0	16	3.1	0.7	10	2.9	1.4
Wisconsin SMR 18	Univ. of Wiscon.	4.6	1.7	7	4.0	1.0	8	5.1	2.1
Statistics (1,332 cultigens)									
LSD (5%)			0.40			0.30			0.23
F ratio			4.00 **			3.81 **			2.37 **
Minimum			1.50			0.90			1.10
Maximum			6.40			7.00			7.70

[1] Disease assessment scale adopted for screening watermelon for resistance to gummy stem blight: 0 = immune; 1 = yellowing on leaves (suspect of disease only); 2 to 4 = symptoms on leaves only; 5 = some leaves dead, no symptoms on stem,; 6 to 8 = symptoms on leaves and stems; 9 = plant dead

*, ** r-value significant at p-value≤0.05 or p-value≤0.01, respectively