

Rhode Island's End Measles Campaign

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A LONG-PLANNED End Measles campaign in Rhode Island came to fruition on Sunday, January 23, 1966. At the same time, one of the most severe snowstorms of the season struck the State. Yet, despite the weather, more than 31,000 children aged 1 through 12 years were immunized that day.

In 1963 a statewide poliomyelitis program had reached about 80 percent of the population at risk. Thus, with the threat of poliomyelitis virtually eliminated, in 1965 the Rhode Island Medical Society turned to common measles, which, ironically, causes more deaths in the United States each year than there are new cases of poliomyelitis.

The knowledge and experience gained from the End Polio campaign eased the task of planning and conducting the measles program. Also, financial support was available from surplus funds from the poliomyelitis program; 25-cent donations had been made at the 275 clinics used for End Polio. As with the poliomyelitis program, the medical society sponsored the measles campaign and the same chairman headed it. The Rhode Island Department of Health handled the logistics with the same team and coordinator as before, and again, the Woman's Auxiliary to the Rhode Island Medical Society enlisted volunteers.

Dr. Bowes, director of medical services of the Pitman-Moore Division of The Dow Chemical Company, Zionsville, Ind., was director of the division of epidemiology, Rhode Island Department of Health, when he prepared this paper. It is based on a paper given at the third Annual Immunization Conference in St. Louis, Mo., April 19-21, 1966.

In organizing the program, the Medical Society's Measles Committee, which included the State epidemiologist assigned to the project by the State health department, was aware that considerable apathy existed toward measles—that too many parents considered it just another childhood disease. To overcome this apathy, the committee engaged the same advertising and public relations firm which had successfully handled the End Polio campaign. The firm selected "End Measles . . . Once and For All" as the theme, and all materials prepared for the campaign were predicated on this theme.

The date for the single-clinic Sunday had to be one which gave the committee enough time to complete all logistical arrangements and which did not conflict with other civic events. We decided that at least 8 weeks were needed to make thorough preparations for the statewide program. Therefore, January 23, 1966, was designated as End Measles Sunday.

Susceptibles

To determine how many children were susceptible, the committee studied U.S. measles incidence reports and all admissions for measles to Rhode Island hospitals during the previous year. The reports confirmed what the committee had anticipated—that children aged 1-12 years who had not had measles or measles vaccine were the most susceptible population to common measles.

In September 1965 a survey had been made in Providence (population 200,000) of 1,200 households, cutting across all 37 census tracts and three socioeconomic levels. From this we determined that the susceptible children repre-

sented 6 percent of the total number of persons in these households. Using the 6 percent as a guideline, about 52,000 children throughout the State would be the target population for the campaign.

Publicity

Three weeks before End Measles Sunday, a luncheon was held to inaugurate the campaign. Management representatives and news personnel from every newspaper, radio station, and television station in the State were invited. Press kits containing complete information on the campaign, measles, and the vaccine were distributed. The radio stations were given 30-second recordings made by physicians to be used as spot public-service announcements. The television stations were given similar 20- and 30-second announcements as well as slides.

Gov. John H. Chafee, serving as honorary chairman of the campaign, pledged his personal support as well as that of the entire State government. A speech by Dr. Anton J. F. Schwarz, developer of the single-dose further attenuated live virus measles vaccine, afforded the news media a news angle with which to start the campaign.

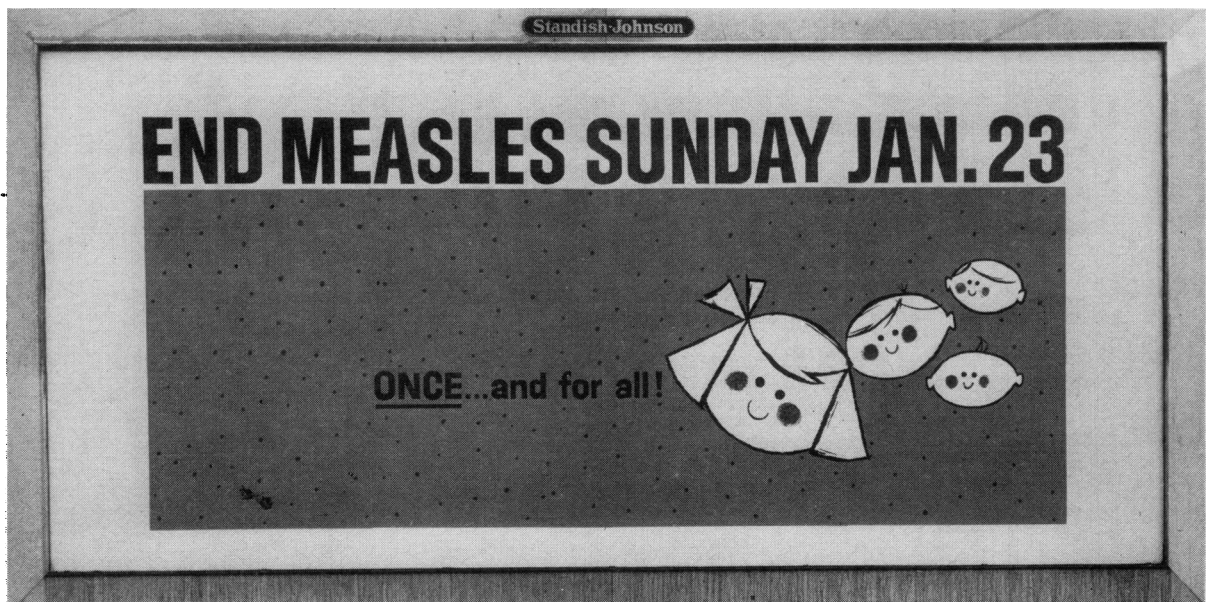
Posters, window streamers, and registration forms, hand-delivered by woman's auxiliary members to drugstores, hospitals, and

other business places, were displayed throughout the State. Every physician and dentist in the State endorsed the campaign by having a poster and registration forms in his waiting room. Billboards also were posted statewide. Rhode Island utility companies and Blue Cross included registration forms in their regular mailings, as did the welfare department with its checks to welfare families.

Clinics

Previous experience had shown that public buildings such as schools and armories were the best locations for clinics. State and local agencies gave their approval readily for the use of the facilities, and 37 clinic sites were acquired to serve all towns in the State. Some towns with few susceptible children combined their volunteer forces into one clinic. In Providence, with more than 12,000 susceptible children, three clinics were needed. The largest clinic site, located in an armory in Providence, could handle more than 8,000 vaccinees if necessary. Unlike the End Polio campaign where high schools accommodating 10,000 persons were used, we felt that the measles campaign should provide one clinic site for every 2,000 susceptible children expected to attend.

The responsibility for manning the clinics was assigned to the Woman's Auxiliary to the



A reminder posted throughout the State

Rhode Island Medical Society. In short order, these women contacted and enlisted about 2,000 volunteers, including physicians, nurses, future nurse club members, PTA groups, bankers, civic and fraternal groups, and members of their own group.

The State nurse epidemiologist, the State nursing association, and local public health nursing agencies jointly scheduled the roster of nursing staffs. All the injections of measles vaccine were to be given by physicians, and each physician would need four to five nurses to prepare and load syringes. At the eight largest clinics where hypospray jet injectors were to be used, fewer nurses would be needed. Nurses would also be needed to screen children for contraindications to the vaccine before they received the injections.

Liability insurance was obtained for all the professional and other workers in case of possible incidents.

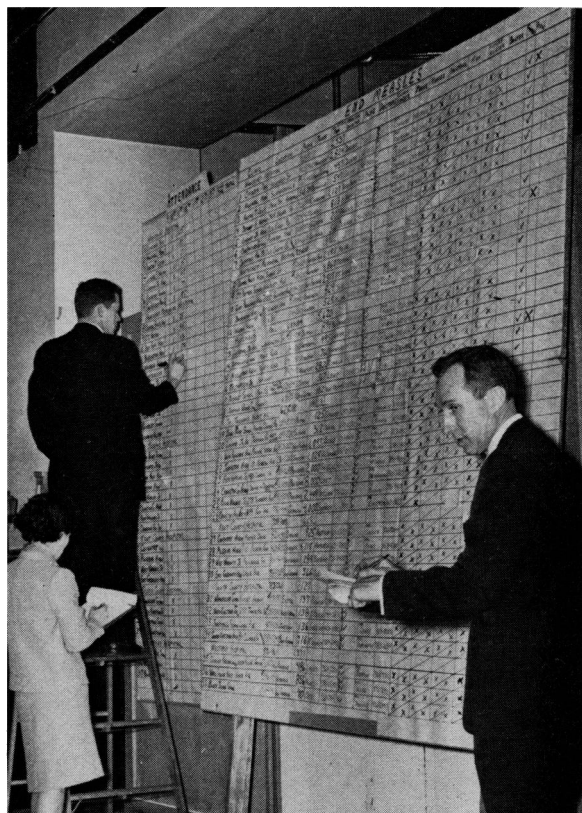
Vaccine and Other Supplies

The single-dose further attenuated live virus measles vaccine was selected for the campaign. Its effectiveness had been proved in other studies (1). The use of two separate injections at a mass clinic is awkward and it requires additional physicians and nurses; it also will reduce attendance because many parents do not want their children to be "shot twice."

Based on its experience with the End Polio program and the fact that 52,000 susceptibles was only an estimated figure, the medical society ordered 70,000 doses of vaccine; 40,000 of the single-dose packages for the small clinics and 600 of the 50-dose bottles for the clinics using hypospray jet injectors. The vaccine was stored at a local warehouse having refrigeration facilities.

Other supplies consisted of disposable syringes with needles (2½ cc. and 20 cc. sizes), acetone, alcohol, cotton balls, pencils, rubber stamps and pads, registration forms, disposable table covers, tally sheets, personal immunization record cards, candy streamers and metal reward badges for the children, identification badges for the volunteers, "25 cents" and "clinic here" signs, money jars and bank deposit slips, and hypospray jet injectors.

All the supplies were collected at headquar-



Tote boards provide ready information on attendance and supplies

ters, established in the medical society's building, and during the 2 weeks before End Measles Sunday supply packages were prepared for each clinic. Each clinic was given more than 100 percent of its supplies, as measured by its susceptible population, of everything but the vaccine, for which the quota was 60 percent, because it was the most expensive item and we had no previous measles campaign experiences to draw upon for attendance rates.

Registration forms, handout cards, and bank deposit slips were stamped with each town's name, so that vaccinees could later identify where they obtained their injection and banks would know where the money-donation jars came from. The handout cards were also to serve as a record for the vaccinee, showing the date of vaccination, the kind of vaccine, and how long it gave protection.

Reward or incentive gimmicks for the children consisted of paper streamers of red-dot candy which looked like measles and badges

which made them members of the "free from measles" Red-Dot Club. The 7 miles of candy streamers were inexpensive.

To answer telephone calls concerning measles, clinics, and vaccine, a battery of telephones was installed at headquarters, and starting 3 weeks before the clinic Sunday they were manned daily by auxiliary members.

The week before End Measles Sunday, as a final reminder, the major dairies of the State included registration forms with their home deliveries, and every daily newspaper in the

State printed registration forms. (Twenty-five percent of the forms collected at the clinics had been clipped from newspapers.) School superintendents, with the cooperation of the State commissioner of education, sent notes home with eligible children to remind parents of the day. Posters were displayed in all schools. Clergymen made announcements at services. Radio and television saturated the air waves with spot announcements, and newspapers carried feature stories.

The news media also covered the arrival and



Peak period at a clinic

Table 1. Income and expenses for End Measles campaign, Rhode Island

Item	Amount
<i>Expenses</i>	
Caterers (refreshments for volunteers)-----	\$1, 096. 29
Liability insurance for workers-----	390. 00
Legal-----	100. 00
Postage-----	400. 00
Publicity and printing-----	11, 688. 21
Shipping-----	139. 25
Stationery-----	110. 00
Storage-----	36. 00
Supplies for clinics-----	988. 78
Telephones-----	595. 63
Truck rental-----	193. 19
Vaccine-----	53, 160. 00
Total-----	68, 897. 35
<i>Income</i>	
25-cent donations:	
36 clinics-----	8, 262. 18
7 mopup clinics-----	911. 97
Surplus funds from 1963 End Polio campaign-----	59, 723. 20
Total-----	68, 897. 35

distribution of the vaccine. Three days before the clinics were held, the vaccine was taken from the warehouse and distributed to seven hospitals which served as depots for neighboring clinics.

Final Preparations

Ten days before the clinics were held, a practice clinic was conducted at a children's center for the benefit of almost 100 nurses and physicians. A detailed manual, prepared by the Measles Committee, was distributed to key personnel. It contained instructions on every phase of the operation, including a diagram of a model clinic. The physicians and nurses participated in preparing the vaccine and vaccinating the children.

Arrangements were made to have refreshments for the workers delivered to each clinic. Headquarters was moved to the largest clinic site, the armory in Providence. A duplicate battery of telephones was installed on the same lines with those at the medical society headquarters. Tote boards were prepared so officials would know at a glance what the turnout was and if supplies were needed. A local ham radio operators' club volunteered its services as sup-

ply runners. Local police had been contacted and arrangements were made to provide traffic control in each clinic area.

Results

Despite a 12-inch snowfall, all but one small clinic opened on End Measles Sunday. (This clinic had a susceptible population of 102 children, and it was postponed for 1 week.) More than 31,000 children 1 to 12 years of age were vaccinated that day.

We were fortunate to have had the assistance of seven Public Health Service physicians who came from the Communicable Disease Center in Atlanta with 11 hypospray jet injectors to supplement our own 5 guns.

Diluent bottles containing 30 cc. of fluid for the multidose bottles of vaccine presented some initial difficulties in mixing for the nurses, but these problems were soon overcome. Should 10- or 20-dose packages be available and acceptable for use, I would urge prospective campaign leaders to obtain these in order to reduce the amount of time necessary for opening single-dose packages.

The clinics were arranged for maximum efficiency to minimize the time between entering and leaving. The first stop was the registration desk where volunteers checked registration forms for proper completion. At the next stop the children were screened by a nurse for contraindications such as fever or colds. Then their arms were swabbed and inoculated and they were given their "reward." The last stop was the contribution desk where they received the handout card. The total time for each child in the clinic was 3 minutes, even at peak periods.

On the following Sunday, six mopup clinics were held in addition to the clinic that had been postponed. Although a snowstorm struck on this day also, 3,200 additional children were vaccinated. Including institutionalized shut-in children, more than 35,000 children, or 67 percent of the estimated susceptibles, were immunized.

Rhode Island's cost was \$68,897 to immunize 35,000 children, about \$2 per child (table 1). (Since campaign costs have been declining, the present campaign cost per child would be about \$1.50.) After the campaign, 20,000 single-dose packages of the vaccine were taken back by

the supplier, and the medical society gave the remainder to the State health department for use in its well-child conference clinics.

The age distribution of the children immunized is shown in figure 1; 54 percent were preschoolers. Children aged 1 year comprised the greatest number of vaccinees; this was the minimum age requirement. Some of the children who came to the clinics were 10–11 months old, some over 12 years; none of these were turned away.

Followup

Two weeks after End Measles Sunday, volunteers from the Woman's Auxiliary to the Rhode Island Medical Society spent 3 days making followup telephone calls to parents of 2,700 vaccinated children whose registration forms had been randomly selected.

The parents were asked if the child was "sick" 7–14 days after being vaccinated, and, if so, was a physician called or seen. The specific findings are presented in another report (2).

Table 2. Susceptible children immunized in End Measles campaign, by socioeconomic group, Providence, R.I., January 1966

Socioeconomic group	Susceptibles		Immunized	
	Number	Percent	Number	Percent
Upper-----	2,083	22.0	606	29
Middle-----	6,279	23.5	4,706	75
Lower-----	3,895	36.0	1,667	43

Generally, however, 26 percent of the parents said that their children had had some form of mild illness or complaint not necessarily related to the vaccine. Of the 10 percent who called a physician and the 4.6 percent who took their children to one, only 50 percent of these parents thought the illness was related to the vaccine. During the 7–14 days after the clinics, school absenteeism among vaccinated children was up only 3 percent over that of the unvaccinated controls.

Figure 1. Age distribution of children immunized in End Measles campaign, Rhode Island, January 1966

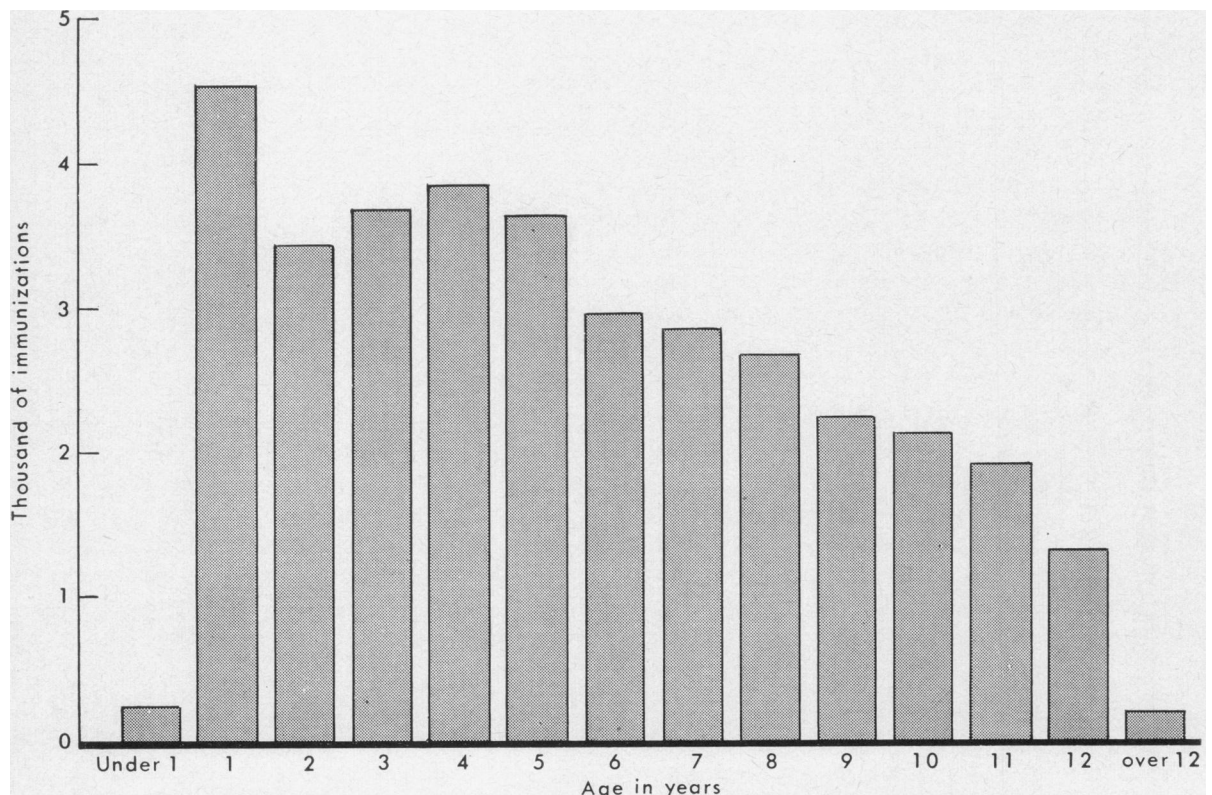
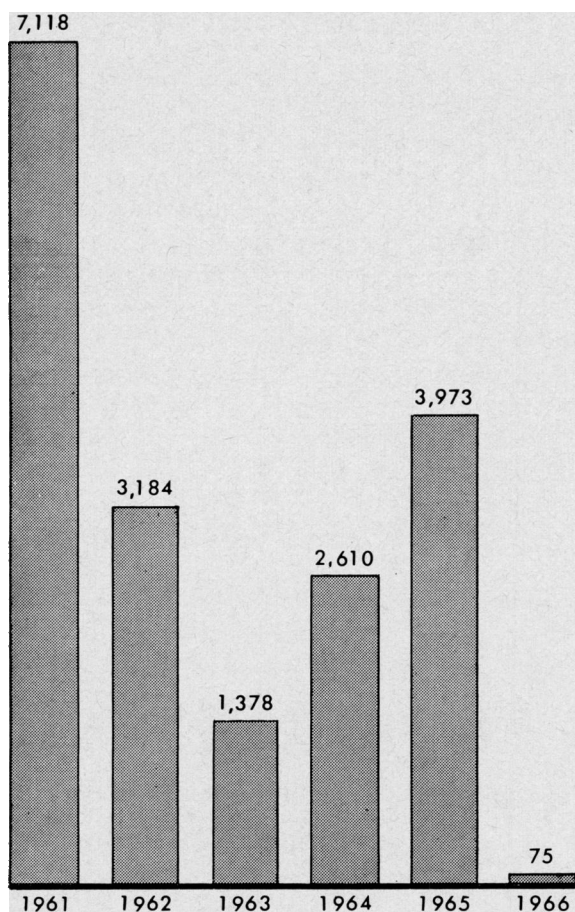


Figure 2. Annual reported cases of measles in Rhode Island, 1961-66



All the registration forms were sorted according to the vaccinees' towns of residence so that we could determine the increased immunization level of each town. The larger towns were observed to have had smaller turnouts than the small ones. Further sorting of the vaccinees in Providence by census tracts revealed that the lowest attendances occurred where the clinic sites were not nearby.

According to our survey of immunization status in Providence in September 1965, 36 percent of the children 1-12 years old in the lowest socioeconomic group were susceptible to measles, while in the highest socioeconomic group the rate was 22 percent (table 2). After the campaign, we found that 29 percent of the upper socioeconomic group was immunized at the clinics, 75 percent of the middle group, and only 43

percent from the lower group. We were not alarmed about the poor attendance of the upper socioeconomic group because they could get their measles vaccine from private physicians, and we were satisfied with the percentage for the middle group. But, it was evident that the lower group needed further programs. Thus, we established measles vaccine clinics near public housing projects as a supplement to our well-child conferences. During the first month, 1,200 children attended these clinics and in the next 4 months 1,490 more attended. The number of reported cases of measles for 1966 is shown in figure 2.

Summary

In Rhode Island a statewide measles immunization campaign reached 67 percent of an estimated 52,000 susceptible children aged 1-12 years. The single-dose further attenuated live virus measles vaccine was used at 37 clinics located throughout the State. Despite severe snowstorms, almost 35,000 children were vaccinated on two End Measles Sundays in January 1966.

The Rhode Island Medical Society, assisted by the Woman's Auxiliary to the society, the State department of health, and about 2,000 volunteers, sponsored the campaign. It was funded by surplus funds from a 1963 End Polio program and 25-cent donations collected at the clinics. The cost per child was approximately \$2.

Much of the campaign's success was attributed to a barrage of publicity—informing the public about the vaccine and the hazards of common measles—provided by a public relations and advertising firm.

During 1966 only 75 cases of measles were reported in Rhode Island in contrast to a median of 3,652 cases for the previous 5 years—a reduction of 97 percent.

REFERENCES

- (1) Anelman, S. L., Schwarz, A., Anelman, M. B., and Zackler, J.: Experimental vaccination against measles. *JAMA* 184: 721, June 1, 1963.
- (2) Byrne, E. B., Rosenstein, B. J., Jaworski, A. A., and Jaworski, R. A.: A statewide immunization program. *JAMA* 199: 619, Feb. 27, 1967.

Thermo Gradient Apparatus



This apparatus and principle economically provide a wide range of temperatures for cultures of micro-organisms, plants, detached plant parts, seeds, tubers, and growing plants with parasites. Its purpose is to reduce neglect of the important dimension of temperature in biological research.

The prototype consists of a steel tank 20 feet long, 2 feet wide, and 11½ feet high divided longitudinally into 12 chambers. Two end chambers, one with a cooling device, the other a heating device, are filled with water. The tank is insulated from surroundings with 6-inch rock wool in a retaining plywood box. The top is insulated with styrofoam or infrared filter-insulator for admission of solar radiation with heat exclusion.

End chambers are adjusted to desired temperatures and a gradient is thus established for heat to flow longitudinally through the tank. Water is placed in the bottom of each chamber to the depth necessary for control of the temperature gradient and to allow working space.

Biological material is floated in trays on the surface. Darkness is provided by two styrofoam covers over each compartment, and a lighted environment, by admitting sunlight through an infrared filter and insulator for each compartment.

Heat is conducted through the tank via steel, air, and water from warm to cold ends. The water provides uniform temperature for the floating biological material by a continuous process of convection; the important feature is that a step-wise gradation of temperature, rather than a continuous gradation, is obtained. At equilibrium each chamber holds a steady temperature. The water layer provides a heat reservoir to buffer against temperature change. This principle applies equally to a small or a large apparatus and the number of chambers may be varied to a smaller or a larger number than is used in the prototype.—S. S. WOLTZ, Ph.D., *associate plant physiologist, Gulf Coast Experiment Station, Agricultural Experiment Stations, University of Florida, Gainesville.* This invention was developed under Public Health Service grant No. AP 00041.

