

IN COOPERATION WITH COLORADO STATE UNIVERSITY

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Three Months in Israel

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There are few countries that figure so often and prominently in the news as Israel, or Palestine, or the Holy Land—depending upon one's viewpoint. From the interest that is created, we often forget that the country is smaller in area than Colorado, has about the same population, and its largest city, Tel-Aviv, is comparable to Denver. To visit the various cities, excavations and religious shrines in company with Israelis, who know their history, is an outstanding experience. The country is beginning to assume an important role in the Mediterranean-European flower market.

Situated in the northern fringe of the subtropical belt, the country ranges from the deepest dry-land spot in the world on the Dead Sea to Mount Hebron in the north, rising more than 5000 feet above sea level. Tel-Aviv is approximately 32° north latitude. There is a wide range of climatic conditions beginning in the coastal plains, rising to the Judean mountains, and then descending on the eastern border into the Rift Valley system with the Sea of Galilee in the north and the Gulf of Eilat on the south. The country is semi-arid to arid, with annual precipitation ranging from 6 to 20 inches. Slightly less than half of the arable acreage, 1.3 million acres, is irrigated, with nearly 90% of the available water supply being exploited. With the exception of a few wells, the major part of potable water supplies are distributed via an aqueduct system from the Jordan River and Sea of Galilee. The winters are usually mild with frost occurring occasionally. Mount Hebron is the only place with appreciable snow. Summers are hot with occasional very hot, dry westerly winds. The Negev desert, beginning about 30 miles south of Tel-Aviv, together with the Judean desert, Sodom and the Sinai form the major part of the country, and may be characterized as extremely rugged, similar to parts of the Southwestern United States. Central heating is not universal, although Jerusalem is sufficiently high to have occasional snow. In general, the climate is similar to Southern California's.

It is rather difficult in most places to arrange tours of the kind possible in Israel. In one day a person could visit the ancient city of Yaffo, where legend says that Andromeda was chained as a sacrifice to the sea monster and Jonah took ship for Tarshish; Jerusalem, sacred to three of the world's major religions; Jericho, probably the oldest excavated city known; the Dead Sea and the Cave of Scrolls; and return via the biblical Plain of Armageddon, or Jezreel Valley, to Acre where, according to Roman historian Pliny, glassmaking was first discovered. Such a trip would certainly be considered a very short course in ancient history.

The people, of course, are what make the country. It is not difficult, in most places, to get a haircut where the barber speaks fluent English, Polish, and German as well as Hebrew. Not all, by any means, possess this type of background. But the immigration and settlement of the State by the Jews, beginning in the late 1800's and 1940's, consisted largely of highly trained and educated individuals with idealistic outlook. Not all Jewish immigrants come with this type of background, and the State has provided schools whereby the children of immigrants from backward countries receive special training to bring them, in one generation, into the 20th century. Since every able-bodied man and woman must serve a period in the armed forces, and return to active duty for varying periods each year, there tends to be a leveling of class distinctions.

Probably most famous of the Israeli agricultural scenes are the kibbutzim. These are communes, usually established by young people, and quite often on the frontiers. The individual owns no material objects, nor does he receive a salary, the kibbutz providing him with all necessities, including schooling, medical services and luxuries, depending upon the financial condition of the kibbutz. While making up less than 5% of the total population, the kibbutzim have a disproportionate effect on the society. In general, kibbutzniks are noted for their motivation and idealism and furnish a high proportion of the country's

leaders. Another type of agricultural set-up is the moshavim—cooperatives in which the members share selling and purchasing, but each family farms their own land. There are a few private individuals that operate similarly to our own farming industry.

As one travels through the country, he may be surprised by the wide diversity of agricultural crops. It is rather disconcerting to see a deciduous orchard next to a banana plantation—although this is the exception. Agricultural exports are the major means whereby the country earns its currency, and the Israelis, it would appear, are going to try everything. A list of crops grown for export sounds almost like Bailey's Manual of Cultivated Plants. Live-stock makes up about 45% of the agricultural production, with citrus, 1.3 million tons in 1969, the primary horticultural export. The citrus industry also uses about one-third of the country's water supply. Wheat is often irrigated in the Negev—something that one does not see in Colorado.



Fig. 1: Typical heater installation in a polyethylene-covered range of miniature carnations. Carnation ranges are seldom heated and this one is the exception. Rose ranges use similar heaters.

In 1965, flower production was practically nonexistent. In 5 years, acreage devoted to flowers, consisting mostly of roses, glads, gerberas, iris and a few carnations, has reached 1,100. Approximately 200 acres are in roses, largely Bacarra with some Tropicana. I was struck by the fact that roses were not misted and was told that the salinity of the water (upwards to 300 ppm chloride) results in severe damage. Carnations consist mostly of miniatures, and are seldom heated. The industry, beginning with outdoor production, is gradually progressing to enclosed structures with more elaborate environmental control, particularly fan-and-pad cooling. Heating units are usually hot air, oil fired and centrally located. Quite often, damage to plants around the heaters could be found. Overhead, rainbird sprinklers are quite common for irrigation, even on carnations.

Simultaneously with the development of the industry, the research organization has come from almost nothing to relatively large and well-equipped facilities at the Hebrew University of Jerusalem at Rehovot and the Volcani Institute of Agricultural Research at Bet-Dagan. Basic and applied research are being conducted. They



Fig. 2: Some "Southern California" plastic construction for roses in Israel.

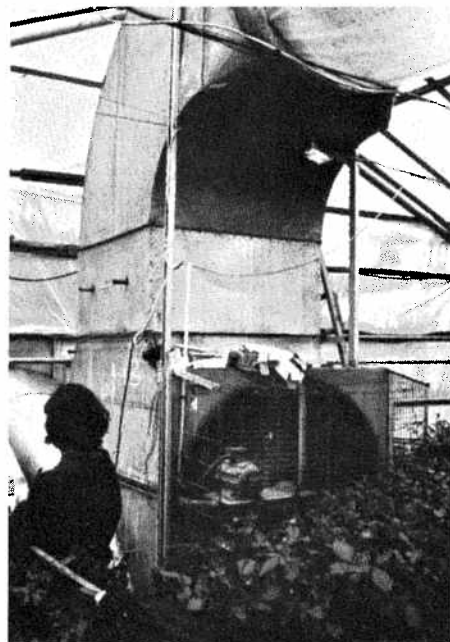


Fig. 3: Experimental set-up for heating and cooling a rose range. All controls for cooling, humidification, etc., are located in the apparatus. Air is distributed through the overhead tube, and the fan, which operates continuously, may act as a regular exhaust unit; or, by control of dampers, may simply recirculate the air in the house. Sixteen of these units would probably be required per acre under Israeli conditions.

have made significant contributions to gladioli production in the use of chemical growth regulators. They recently started a Gerbera selection program, using a new system of vegetative propagation that avoids the usual problems encountered with rhizome division. Rose work deals with pinching, use of chemicals such as ethrel, and effects of temperature and other factors on bullheads and bluing. There are quite extensive greenhouse facilities with applied research on watering, fertilization and optimum temperatures for roses. I expect to see some significant information on roses to come from Israel in the next few years.



Fig. 4: Cheap plastic construction. The "ridges" are actually the walls of the house. The black tubes are filled with sand, and there are no supports under them. Support structure is minimal.

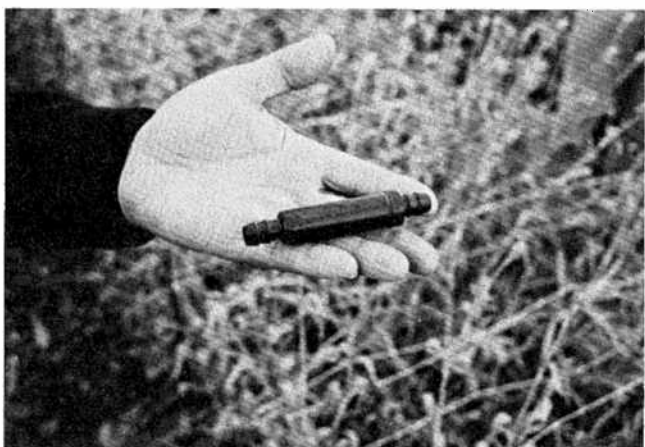


Fig. 5: Israeli "trickle" irrigation device being used quite successfully, particularly with saline water. The irrigator fits directly into the plastic pipe and water trickles out one end.

The situation in Israel may be characterized by very rapid development with all the usual mistakes and duplication common to such conditions. The government provides a well-run advisory service, and conducts tests on exhaust fans, heaters, etc. Subsidies for new construction are provided, and the regulatory agencies figure prominently in the management decisions—largely due to problems of foreign exchange where equipment must be imported. Unfortunately for us, most of the information that could be of use to Colorado growers is in Hebrew. The Israelis have good ideas and are not afraid of trying them regardless of how ridiculous they may appear.