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MELONS

in Illinois

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GROWING MELONS IN ILLINOIS

By C. E. MITCHELL and W. A. HUELSEN¹

MUSKMELONS AND WATERMELONS are not only a general favorite in home gardens in Illinois, but they have a definite place as cash crops in certain parts of the state close to local markets or where it is possible to ship to distant markets. While extensive shipping areas are not likely to be developed in Illinois because of less favorable climate, lack of irrigation facilities, and the competition of large commercial production centers in other states, there is nevertheless a place for a product that will reach consumers in better condition than melons picked partly ripe and shipped long distances, as happens with a large proportion of the melons reaching Illinois markets.

Muskmelons and watermelons are grown to some extent in every state in the Union either for local markets, in home gardens, for shipping to distant markets in refrigerated cars, or for sale at roadside stands. These two melons are grown in much the same way, though picking and marketing practices are somewhat different.

CHOOSING AN AREA

Heavy commercial production of watermelons is limited to the Southern states—Georgia, Florida, Texas, North and South Carolina, Virginia, Missouri—and California. Most of the commercial production of muskmelons is concentrated in southern California, Arizona, Colorado, Texas, Michigan, Indiana, and the tri-state area of Maryland, Delaware, and New Jersey.

Each of these large commercial areas has certain advantages in soils, climate, and moisture that make melon production there profitable. It is well to understand these conditions in choosing areas in Illinois for growing these crops.

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Soil. Sandy loam, sandy clay loam, and silt loam soils are favorable for muskmelons. They are better drained than heavier soils and warm up much faster in the spring. Sandy soils with a definite subsoil are preferred to deep sandy soils because of their better moisture conditions; but a tight subsoil should be avoided.

Good drainage is a basic requirement for melons. Flooding or slow drainage during the ripening period will cause muskmelons to have a poor flavor and poor carrying qualities. Sandy soils should, however, contain considerable organic matter in order to increase their ability to hold water, especially in years of too little rainfall. Experiments show that muskmelons yield best on sandy soil that is very slightly acid to neutral, having a pH range of 6.4 to 7.2.

Watermelons also require well-drained soils of high fertility which warm up early in the spring. Large commercial acreages of watermelons in the South are frequently planted on new ground recently cleared of timber. Such a soil contains considerable decayed vegetable matter, withstands dry weather better than land that has been cropped for several years, and is ordinarily free from the soil-borne diseases that cause serious crop losses. Some of the heaviest watermelon yields are produced in the sandy river bottoms or delta soils of southeastern Missouri and in sections with similar soil conditions.

Climate. Both muskmelons and watermelons need a long frost-free period and a warm growing season. They are very easily damaged by frost and must be planted in the spring when danger of frost is past.

Rapid vine growth is made during the period when both days and nights are warm, but the fruits ripen slowly after the nights become cool. High sugar content in the fruits depends upon dry, warm weather during the ripening period. If cloudy or rainy weather persists, muskmelons may develop an insipid flavor. There is nothing more appetizing than a high-quality melon nor more disappointing than a poor melon.

Moisture. Both muskmelons and watermelons suffer permanent injuries even from short periods of drouth. In the arid sections of the United States the irrigation of muskmelons and watermelons is probably the most important operation during the growing season. In Illinois where the crop depends on rainfall, effort should be made to conserve as much moisture as possible. This may be done by choosing a soil that has considerable organic matter, selecting a field with enough but not too much slope, and by following well-established soil-conservation practices. On soils that drain slowly, a planting and cropping system that will improve drainage is very necessary. A gen-

eral practice is to ridge the dirt toward the plants, leaving a drainage furrow between the rows.

Since rainfall during the growing season is often deficient in Illinois, it may be well worth while to install some system of irrigation, using subirrigation, furrows, porous hose, or an overhead device. In the rare cases where furrow irrigation is used, the seed should be planted about 3 or 4 inches from the furrow in order to permit the water to soak out to the seed or roots of the young plants. Following or at the time of final cultivation, a larger furrow 6 or 7 inches deep is plowed between the rows to facilitate irrigation after the vines intertwine and cultivation is no longer possible.

PLANTING AND CARE

Crop rotation. In growing melons, crop rotation is an important way to reduce the prevalence of soil-borne diseases. The use of legumes is also important — when plowed under they help to maintain or improve the physical condition of the soil, and they add nitrogen as well as organic matter to the soil.

Muskmelons should not be rotated with related vine crops (cucumber, squash, pumpkin) oftener than once in five or six years. For practical purposes, however, many growers in Illinois plant muskmelons on the same piece of ground every second year where *Fusarium wilt* is not present. This practice tends to delay the spread of this disease.

Muskmelons yield well following fall-plowed sod of alfalfa or clover. In market garden areas it has been customary to plant after Irish potatoes or sweet potatoes, which in turn have followed a cover crop. The same practice may be applied to watermelons where the soil is not infested with the wilt organism (*Fusarium niveum* E.F.S.), but if it is present watermelons should not be grown oftener than once in eight to ten years. A strict rotation program will materially reduce the chances of serious infestations, though it will not completely rid the soil of the wilt organism. Corn, wheat, and soybeans, followed by clover or pasture, are desirable intermediate crops in Illinois.

Preparing the soil. Melons need a good seedbed. When following a green-manure crop, fall plowing is likely to be better than spring plowing, but if spring plowing is necessary it should be done early. When green crops are plowed under in the spring, the soil must be carefully prepared: (1) plow it before the cover crop grows too rank;

(2) plow at least a week before planting; (3) disk and harrow the ground before it dries out; (4) if the ground is loose, especially where the cover crop grew thick, pack it with a roller.

Fertilizers and manures. Melons are a rapidly growing crop and use large amounts of plant food. Where manure is scarce, it may be placed under the hills and worked into the soil. Experiments have shown (1) that manuring under the hill is far superior to broadcast manuring, unless large quantities of manure are available for broadcasting; (2) that manure under the hill gives a large yield of early melons; and (3) that as little as 2 or 3 tons of manure per acre under the hill may give a greater net profit than 16 to 20 tons broadcast, due to the greater cost of broadcasting as well as the greater cost of the large amounts of manure used. Under central Illinois conditions manure has to be used to get the best crops of muskmelons.

Commercial fertilizers applied to muskmelons and watermelons may not increase the yields, according to Illinois experiments. In fact, excessive amounts of nitrogen and potash may reduce yields. Nevertheless, where manure is lacking and the soil is deficient in nutrients, there is no question but that a fertilizer should be applied in moderate amounts. Fertilizers high in phosphorus will probably give the best results, judging by the Illinois tests.

To assure a large enough supply of organic matter for satisfactory yields where no manure is available, melons should be planted on land previously in meadow or pasture. Or they can be planted after a green-manure crop or a winter cover crop, preferably a legume, has been plowed under.

Green-manure crops are plowed under in the fall and are usually well decayed by spring. Spring plowing of winter cover crops presents quite a different problem, especially where the growth is rank. The organisms causing the decay of the green matter plowed into the soil require considerable nitrogen. In their use of nitrogen these organisms compete with the melon plants and may deprive them of some of the nitrogen they need, retarding their growth. This difficulty can be overcome by broadcasting nitrogen on the cover crop when it is planted in the fall, or on the field early in the spring or just before the crop is plowed under. In any event, when a cover crop is to be plowed under it should be done at least a week before the melons are planted, preferably longer. This gives decay a chance to become well advanced before the melons are seeded. The soil should be worked thoroughly so that the green material will be well distributed.

In a dry spring, plowing under too large amounts of organic matter may delay or cause uneven seed germination. This is due to the fact that the organic matter acts as a barrier to the natural rise of water from the subsoil. Rolling the well-disked soil will help; otherwise it is necessary to wait for heavy rains before seeding the melons. Experiments in Michigan have shown that a 3-12-4 commercial fertilizer applied at the rate of 300 to 600 pounds an acre produced practically as large yields as manure applied at the rate of 16 to 20 tons an acre. However, in order to obtain such comparative yields, the humus content of the soil had to be maintained by plowing under green manure or cover crops. According to these results, cover crops should be used primarily to maintain the organic content of the soil and not as a substitute for manure.

Seed supply. Most muskmelon seed is grown within a limited area near Rocky Ford, Colorado. The climate there is very favorable to the growing of melons of high quality free from disease. Small quantities of seed are, however, grown by commercial seedsmen in other favorable areas close to their own production grounds.

Good seed, more than any other single factor, is responsible for good profits in growing muskmelons, with the possible exception of the practice of marketing only quality fruit. It is a cheap investment, as the amount of seed needed per acre is small.

To be certain of a pure strain, muskmelon seed should be purchased from a reputable firm whose product has proved uniform and of high vitality from year to year. Seed production is a technical procedure requiring experience, especially as varieties cross freely; and the average grower has neither the time nor the experience to do a good enough job in selecting and saving seed.¹

Contrary to popular belief, muskmelons do not cross with cucumbers, watermelons, pumpkin, or squash, but they will cross with other varieties of muskmelon. This fact alone means that seed producers must isolate strains and select individual fruits when cutting seed. Seed saved from vines after the early fruits have been marketed is inferior and usually produces a crop having reduced vigor and lacking uniformity.

¹ Commercial seed producers have the facilities to isolate their fields and to save seed properly. In addition they guard the purity of their seed stocks by breeding, selecting, and roguing. Pressure and demands of associations of melon growers in the shipping areas for uniform strains of seed have had much to do in bringing about development of better seed by seedsmen.

For information as to sources of seed, contact a reliable seedsman for a descriptive catalog or write your Experiment Station for information.

High-grade watermelon seed is not so readily available as high-grade muskmelon seed because of the methods followed in commercial seed production in the past. In recent years, however, the more careful seedsmen have used greater care in maintaining the purity of their seed stocks. The development by some of the state experiment stations of strains resistant to *Fusarium* wilt has also been of great help. Many growers save their own seed, as only a small number of choice melons are needed to furnish enough seed to plant a crop.

The method used by growers in saving their own watermelon seed is, before the first picking, to mark a number of melons of the desired size, color, and vigor, growing on vines that are free from disease. These melons are allowed to become dead ripe. They are then picked, cut lengthwise, and the seed-bearing pulp scraped out into tubs or barrels. Rapid fermentation occurs, and after 24 to 36 hours the pulp begins to float to the top and the seed to settle to the bottom. Water is added to dilute the mass, and the fermented pulp is floated off. The seeds, which are heavier, remain at the bottom. They are washed several times to remove any remaining pulp and then spread out in a thin layer on screens or cheesecloth to dry.

Time of planting. Watermelons and muskmelons should not be planted until the soil warms up and until danger of frost is past. In some of the western muskmelon shipping sections, it is a common practice for growers who hill-plant or transplant from hotbeds before the last frost date, to place covers over the hills. The higher prices received for early melons from these areas justifies the greater expense. In Illinois, however, commercial muskmelon growers do not use plant covers and the practice cannot be recommended, as damping-off may occur during extended rainy periods.

Planting muskmelon seed. For small acreages, or where early maturity is desired, hotbeds or sash-covered frames are often used for starting the muskmelon plants, which are then transferred to the field when the weather permits.

The most common and rapid system of planting is to drill the seed a few inches apart in rows 5 feet apart, the depth not to exceed $1\frac{1}{2}$ inches. One man on a tractor with drill attachment can plant as much as 35 or 40 acres a day at 2 to 3 pounds an acre.

Another common method is to plant the seed directly in hills. A hoe, a hand-planter, or sometimes a check row planter, is used for this purpose. In regions where the fields are not irrigated and the seed is planted on level ground rather than on ridges, this system permits

early cross-cultivation. With rows 4 to 6 feet apart and hills about the same distance in the row, this method will take about a pound of seed to the acre when 8 to 10 seeds are planted in a hill.

Planting watermelon seed. Watermelons are usually planted farther apart than muskmelons. In some parts of the country rows vary from 8 to 10 feet apart, with hills 6 to 8 feet apart in the row, while in other sections a planting distance of 10 x 10 feet and even 12 x 12 feet is popular. The proper spacing will vary with the fertility of the soil, the number of cultivations, and the type of spray or dusting rig used.

Methods of planting watermelons are similar in almost all sections of the country. After the ground has been worked into a good seedbed, it is marked in both directions at the desired planting distance. Six or seven seeds are usually planted at each cross mark and covered by means of a hoe to a depth of about 1 inch. Drills adapted to this type of planting are available; and if seed is plentiful and the acreage large enough, it may be better to plant by machine rather than by hand.

Thinning melon plants. Since, in order to insure a good stand, it is good practice to plant more seed than necessary, melon fields always require thinning. Thinning should be delayed, however, until it is reasonably clear that the plants are well established and the striped cucumber beetle is under control. Care should be taken to leave only the more vigorous plants, so far as this is possible.

Where the drill-row method of planting muskmelons is used, it has been found that marketable yields were highest for plants thinned to about 12 inches. However, in Illinois it has been customary to thin to one plant every 2 or 3 feet, leaving the more advanced and vigorous plants, which will have formed 3 or 4 true leaves. These spacing recommendations are approximate, however, and may be modified by each grower according to the fertility of his field. Excessively wide spacing may cause poor coverage of fruits by the leaves, and poor coverage results in sun scalding.

In hill-planted fields the plants are thinned in two or three steps: (1) at the first weeding, the hills are thinned to 4 or 5 plants, thus preventing crowding as soon as possible and reducing later thinning work; (2) a week or ten days later the plants are thinned down to 2 or 3 of the strongest plants; (3) the final thinning to 1 plant takes place when 3 or 4 true leaves have formed.

Cultivation. Muskmelons and watermelons should be cultivated as soon as the rows or hills can be readily seen. This will usually be

within 3 or 4 days after the plants come through the ground. The main value of cultivation is to keep down weeds until the spread of the vines prohibits further cultivation.

Since the root systems of both watermelons and muskmelons are shallow, deep cultivation should be avoided as it may destroy the roots and thus damage the crop. The roots of these plants have a spread similar to or slightly greater than the vines. When the vines of muskmelons are 2 feet long, the taproot is only 18 inches deep, but the longest of the numerous horizontal roots extends outward 3 feet. On maturing vines taproots penetrate below the 3½-foot level and the surface roots often extend 3 feet beyond the 12-foot vines.

MUSKMELONS

Picking the Fruit

Before picking the melons every eighth or tenth row should be laid carefully together to make a roadway so a truck or wagon can go through the field without damaging the vines too much. The crates of melons are carried to the roadway and loaded, and usually hauled to a central packing shed, where they are graded and packed for shipping or for the local market.

Best stage to pick. The eating quality of muskmelons depends directly upon proper ripening while on the vines. Muskmelons should be picked at the full-slip stage so that the sugars and fruit texture will be fully developed. At full-slip, an abscission layer forms, causing the melon to separate, or "slip," from the vine when slight pressure is exerted with the thumb, leaving a clean cavity at the stem end of the melon. Firm, solid melons at full-slip stage will hold their texture and quality when placed on the market.

Under modern methods of precooling and refrigeration the recently introduced strains of melons reach distant markets in good condition after ripening on the vines to the full-slip stage. In fact, many of them are not edible until a few days after the full-slip stage. Until about twelve years ago most shipping and market types had to be picked at the half-slip stage for shipping, as they were at the best stage for eating when they reached the full-slip stage. Powdery Mildew-Resistant #45, which was introduced as a disease-resistant type for the Imperial Valley of California, proved to be a good shipping type when picked at the full-slip stage, becoming edible 3 or 4 days later. Under refrigeration the lapse of time is even longer.



A good crop of well-netted salmon-fleshed muskmelons (cantaloupes) of the size ($2\frac{1}{2}$ to 3 pounds) now popular in city markets. (Fig. 1)

How often to pick. Picking is required about every other day at the beginning of the season, then every day during the peak, to keep up with the ripening of the fruit.

Each grower must regulate his picking times according to local conditions, such as distance to market and kind of transportation used — whether by rail or by truck and whether under refrigeration or not.

Marketing Muskmelons

Three common methods of marketing the muskmelon crop can be used by Illinois growers, the best one depending on local conditions. The first is to sell at retail from a roadside stand or haul to the nearest local market; the second is to truck or ship by express to dealers in nearby cities; and the third is to ship by freight to commission men in the larger cities.¹

No matter what marketing method is used, only the highest quality

¹ In the large commercial growing areas of the West, packing and marketing is handled by packing companies that do all the grading, packing, and marketing for the growers with whom they have contracts. A grower merely brings his melons from the field to the central packing shed. The individual packing shed on growers' farms is rapidly disappearing.

melons should be offered. In this way an enviable reputation can be built up and the higher price obtained that is usually paid for a dependable product.

Grading. Some growers and packers are so eager to get the higher prices offered on an early market that they pick their melons before they are ripe and ship green, poor-quality fruit to market. *This is a mistake.* People hesitate to buy such melons, prices for them have to be cut, and there are likely to be no repeat orders. A good market is lost.

For marketing in Illinois, muskmelons should be separated into at least three grades:

First is the **U. S. No. 1 official grade**, which "shall consist of cantaloupes of one variety which are firm, mature, well formed, well netted, and free from aphid honeydew, cracks, sunburn, decay, and from damage caused by dirt, moisture, hail, disease, insects, or mechanical or other means." These melons usually make a uniform pack.

The **second grade**, which is not official, may consist of marketable melons that are firm but odd-shaped, with slight defects in netting, and may include those which are only half slips.

The **third grade**, the culls, are not marketable due to being soft, cracked, overripe, immature, poorly shaped, and diseased. These should be thrown out and no seed saved from them.

Since the quality of cantaloupes is closely related to the amount and character of netting, this should be an important consideration in grading.

Packing. Melons for shipping are usually packed in slatted crates with the following dimensions:

| | | |
|---------------------|----------------------|---------------------------|
| Standard..... | 12 x 12 | x 23 $\frac{1}{2}$ inches |
| Jumbo standard..... | 13 x 13 | x 23 $\frac{1}{2}$ inches |
| Standard flat..... | 4 $\frac{1}{2}$ x 13 | x 23 $\frac{1}{2}$ inches |
| Jumbo flat..... | 5 x 14 $\frac{1}{2}$ | x 23 $\frac{1}{2}$ inches |

One of the reasons for the use of these standard-sized crates is that they can be handled and shipped more compactly than other types of packages. Also the unit for price quotations is the equivalent of a standard crate holding 45 melons. Various types of crates resembling the standard crate are, however, being used with success. In many sections of the East various types of baskets are used. Some of these are the 12-quart climax, the bushel, and special willow baskets. Almost any of these containers are satisfactory for markets not too distant.

¹ Description is taken from U.S.D.A. Handbook of United States Standards for Grading and Marketing Fresh Fruits and Vegetables.

In packing a crate, select melons that are uniform in size, shape, and netting and place them firmly in the container, the long way of the melon running the long way of the crate. Do not jam the melons into place, as such rough treatment will bruise them and will be followed by rapid breakdown of rind and flesh.

MUSKMELON VARIETIES

Many varieties of muskmelons that originated a good many years ago are still widely used, but changes in market demands and the prevalence of diseases and insects have led to the development of new strains. It is impossible to describe here all the varieties now on the market. Only the important ones that are now in widest use commercially and in home gardens are included. Many varieties are merely improved selections from other well-known strains.

Most consumers are demanding a cantaloupe typified by the variety Powdery Mildew Resistant #45 (a Hale's Best type). The local market types such as Bender's Surprise, Honey Rock, Queen of Colorado (also known as Pride of Wisconsin), etc., do not sell well in the large markets in competition with the Hale's Best types. Some of the large-fruited types are grown for local consumption and are handled in bulk.

The winter melons, which keep much longer and mature later but are not in edible condition at harvest, are grown for a limited market. Typical of this group are the Honey Dew, a green-fleshed melon of large size, with a smooth, cream-colored outer skin, and the Honey Ball, similar to Honey Dew but smaller and with a slight netting. These varieties are not in as much demand on the market as the netted salmon-tinted varieties.

Commercial seed breeders and experiment stations are constantly working to breed better muskmelons. Growers will find it worth while to keep in touch with the latest developments and as new strains are introduced, try them out on a small scale until convinced that they are worth using in place of varieties previously grown.

Two general types of muskmelons are grown in Illinois — the large-fruited green-fleshed type and the salmon-fleshed type.

Principal Green-Fleshed Varieties

Hackensack. A flat type, extra large, prominently ribbed, netted melon used mostly in home gardens and for local markets.

Honey Ball. An excellent shipper and an excellent type for home and

market gardens. Fruit is small, perfectly round and lightly netted, with very hard greenish-white rind, thick green flesh, and a small seed cavity.

Honey Dew (also known as Pollack 10-25). Believed to have originated in Africa, this melon requires a long season, but once matured makes an excellent shipper or may be stored or kept in good edible condition during most of the winter months. It is a large globe in shape, about 8 x 7 inches in diameter, with a smooth cream-colored rind upon ripening and light-green flesh.

Rocky Ford or Netted Gem. This melon has served as foundation stock for many of the finest varieties of today. It is used principally for home and market gardens. It is nearly round, measuring about 5 x 5½ inches in diameter, has indistinct ribs, and is heavily covered with hard netting.

Salmon-Fleshed Varieties

In the United States the pink, or salmon-meated, varieties with heavy outer netting are commonly referred to as "cantaloupes."¹ They are more favored by growers as shipping melons, and most people like them better than the green-fleshed varieties. Suggested varieties of this type are the following:

Adapted for home and market gardens

Osage (also known as Miller's cream). Under normal growing conditions this melon is 7 inches long and 6½ inches in diameter. Rind is not hard enough nor flesh firm enough to make this melon a good shipper—it is a good melon for home and market gardens.

Tip Top. Large round to oval, slightly netted, distinct ribbing, thick flesh and fine texture. Almost exclusively used for home and market gardens.

Bender's Surprise (also known as Delicious and Early Bender). Similar to Tip Top but a little later, having a firmer flesh and harder rind, which permit it to be shipped longer distances. Generally used in the home garden and in market gardens for nearby shipping.

Milwaukee Market. Fruit nearly round, with prominent ribs and sparse, coarse netting; light green rind, thick flesh, and small seed pocket. Some seedsmen advise Bender's Surprise instead of this variety.

Shipping types also adapted for market gardens, quite popular with Illinois growers

Hale's Best #36. One of the most popular varieties with shippers and growers. Slightly oval in shape, very uniform, heavily netted, indistinct or no sutures, small seed cavity and deep salmon-colored flesh.

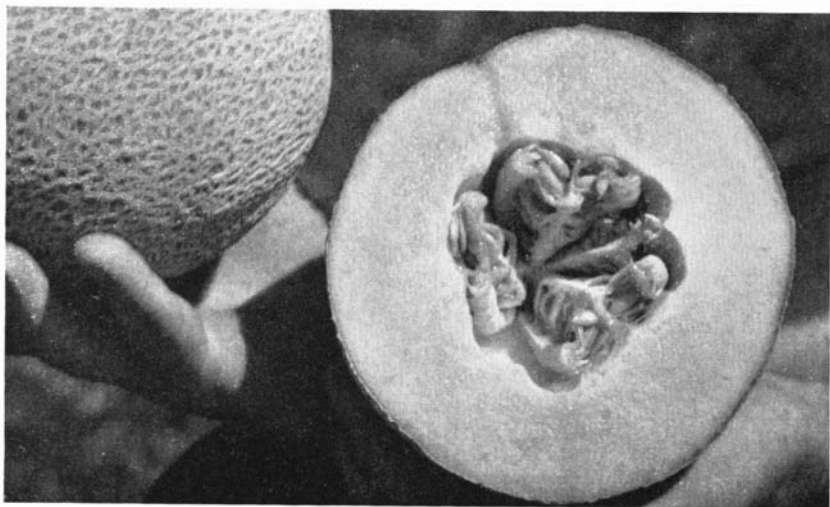
936. A selection of Hale's Best slightly larger than Hale's Best #36 but otherwise about same. Widely used by market gardeners and for roadside markets.

Hearts of Gold (also known as Hoodoo). A midseason melon, very

¹ Since this term has been used for many years it may be considered correct, though strictly speaking it refers to a long-keeping melon with hard, ridged, warty rind known in Europe but practically unknown in the United States.

popular among market gardeners and at the same time a good shipper. Fruits almost round, well netted except in grooves between ribs, greenish rind, and a very small seed cavity.

Queen of Colorado (also known as Pride of Wisconsin, Improved Honey Rock, and Sugar Rock). This variety is becoming quite a favorite with market gardeners and makes a good shipper. Medium size, nearly round, hard grayish-green rind, coarsely netted. Thick flesh of deep salmon color.



A thick-fleshed muskmelon with a small seed cavity. Growers have a choice of a number of salmon-fleshed varieties with these characteristics. (Fig. 2)

Schoon's Hard Shell Bender. Of the same general type as Bender's Surprise but notable for its hard rind, which fits it better for shipping and market.

Iroquois. Used to some extent in Illinois. Developed in New York at Cornell University as a *Fusarium*-resistant variety. Fruits round to oval, with prominent ribs and good netting. Rind is tough and holds up well.

Other varieties very popular in large production areas of the West and grown to limited extent in Illinois

Hale's Best #45 (also known as Imperial #45 and Powdery Mildew Resistant #45). Resistant to certain forms of powdery mildew and used extensively where this disease may limit production. Has been a popular shipping type in the West but is giving way to newer and superior types which are more resistant to both races of the powdery mildew fungus. Fruits are short oval, with indistinct ribbing but well netted. Flesh is firm and thick, light orange in color, and similar to Hale's Best. Can be picked at full slip for shipping.

Texas Resistant #1. Developed at the Texas Agricultural Experiment Station, this variety is highly resistant to aphids. Vines are vigorous, leafy, and prolific. Fruits are of desirable shipping size, with firm rind, moderate netting and salmon-colored flesh.

Improved Perfecto. One of the best late-season melons. Fruits nearly round, with hard gray netting and no ribbing. Thick salmon-colored flesh with an unusually small seed cavity.

Powdery Mildew Resistant #5 (also known as Imperial #5). A type similar to Hale's Best #45 introduced in 1942 and resistant to both races of the powdery mildew fungus. Fruits are round, slightly ribbed, fairly well netted, with firm flesh and a small seed cavity.

Honey Rock (also known as Sugar Rock). Fruits are nearly round, with a gray-green skin covered with coarse sparse netting. The thick flesh is orange-salmon in color, with a green ring beneath the rind.

Purdue #44. A new type developed in the Midwest which may be adapted to Illinois. It is an original selection out of the variety New Seed Breeders and is similar to Hale's Best #36, 936, and Hale's Best #45. It appears to be resistant to *Alternaria* leaf spot, a destructive disease of muskmelon in southern Indiana.

Powdery Mildew Resistant #6. A new variety developed by Dr. T. W. Whitaker and Glen N. Davis at La Jolla, California, and being grown extensively in the Imperial Valley of California. Has vigorous vines with very heavy foliage and is resistant to powdery mildew. Fruit is mostly round, with a small button at the blossom end, well netted, with thick flesh and small seed cavity.

Powdery Mildew Resistant #7. Same as Powdery Mildew Resistant #6 except fruit is round to flat. Comparatively small, well netted, with well-colored thick firm flesh and small seed cavity. Later maturing than #6.

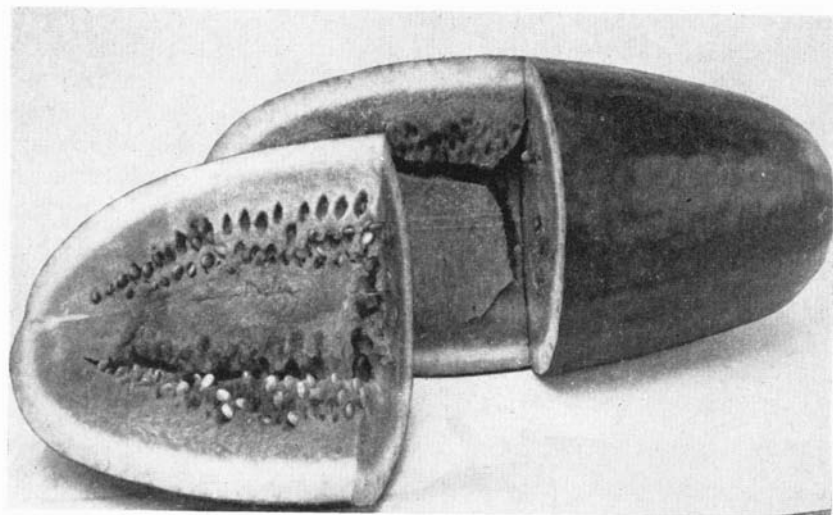
WATERMELONS

Thinning the Fruits

Since watermelons are graded according to size and shape, thinning the fruits on the vines may be advisable. By reducing the number of melons per vine, the size of those left on the vine is increased. Misshapen and damaged fruits may also be removed.

When the largest melons are about 4 inches long, all but 2 or 3 of the best are cut from the vine with a penknife or other handy cutting tool. The smaller varieties are not pruned so close, 4 or 6 melons usually being left on the vine. Home gardeners rarely prune their melons except when they happen to take special pride in having large handsome fruits.

That pruning is not always profitable was shown by work at the Indiana Experiment Station with the Hawkesbury variety. Even with



This watermelon is ready to eat. The flesh is firm and fine-grained, with well-developed color. The rind is not too thick. (Fig. 3)

the normal price differentials in favor of the larger melons harvested before September 1, thinning proved unprofitable.

Picking Watermelons

For convenience in harvesting watermelons, the vines should be laid together to form a roadway, as described on page 10 for muskmelons. This is quite important, as it means that the melons will be handled less if their loading in the field is made more convenient.

Watermelons require the same care in harvesting as muskmelons, and they must be picked at the proper stage of maturity. This is especially true of melons shipped to the northern markets. The sugar content of the flesh and ripeness of the seeds are the real tests for ripeness, but since these tests cannot be applied on a field scale, judgment has to be based principally on certain external indications. The common thumping test should be supplemented by noting the change in the color of the lower part of the melon that rests on the ground. When a melon reaches maturity this color will change from the pale white which it was prior to maturity to a slightly yellowish color.

Experienced pickers are needed to select ripe melons suitable for shipping or for local markets. This is the one operation in melon growing where experience counts.

Watermelons should be cut from the vine and not pulled or broken off. Slender-bladed penknives or stiff-backed peeling knives are satisfactory.

Melons should be handled as little as possible before shipping. Avoid stacking them in the sun and leaving them in the field overnight. When not handled properly they will break down in transit, and will have a musky, slick, unpleasant flavor when they reach the consumer.

Trucks used in hauling the melons should have the beds covered with a layer of straw or some other matting to cushion the jarring. At the time of shipping, many growers in the South apply some bluestone-starch paste to the cut stem to prevent stem end rot in transit (see page 24).

Marketing Watermelons

Watermelon prices are subject to wide changes as the supply of this fruit is highly seasonal. Since watermelons must be classed as a refreshment food rather than a required food, and are purchased largely by people with low or medium incomes, prices fluctuate according to the incomes of these groups.

Grading. Only those melons which will stand shipping well should be packed for shipping. Even with the best of care a few overripe or green melons will be picked, but these should be culled out while loading. The condition and quality of the first melons to arrive on the market will determine to a considerable extent the prices for the rest of the shipping season.

For carlot shipments, melons are usually graded to size per car unit.¹ Each melon is weighed before it is loaded into the car. If the average weight is less than 30 pounds, no melon is included that falls more than 4 pounds below this average. However, the same conditions apply here as to shipping muskmelons: growers situated closer to market or who sell at roadside stands need not be as critical of size variation as those who ship greater distances.

Packing. When melons are shipped by truck, the bottom of the bed and the sides of the truck should be well padded with straw. One-inch excelsior padding, or ½-inch corrugated paper tacked to the sides of the truck or car will give good protection.

If the watermelons are to be trucked only to a local market, careful loading in the field will suffice. To prevent excessive crushing and to hold bruising damage to a minimum, the melons should not be

¹This is done to a large extent in the large commercial growing centers among cooperative associations.

loaded more than 5 deep whether they are shipped in a truck or in a refrigerated car.

Melons to be hauled long distances either by car or truck require orderly loading. Regardless of the shape of the melon, place one row of melons end to end across the front of the truck or either end of the



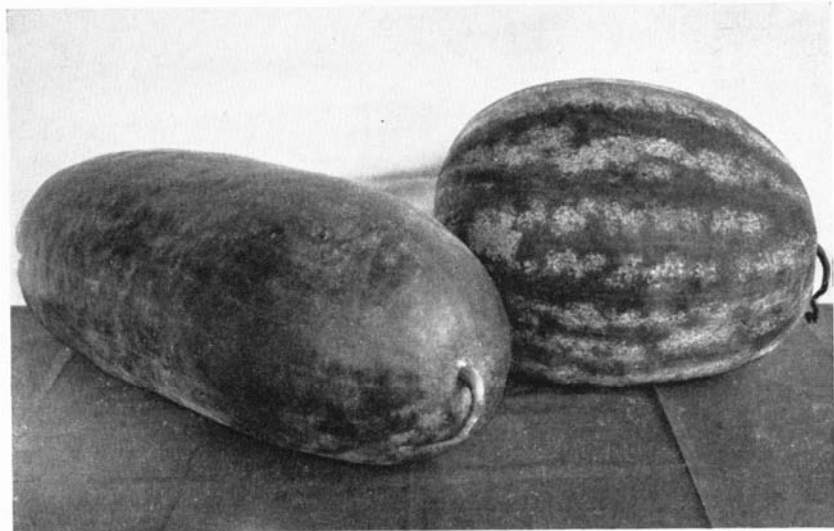
A uniform lot of watermelons being correctly packed for shipment by rail. Most shippers use a five-row stack. Note bed of straw on floor of car and the paper tacked to the sides of the car. Any vacant spaces between melons should be filled in with straw or excelsior. (Fig. 4)

car. Lay the rest of the melons end to end the long way of the car or truck. A full load usually consists of 5 layers.

Since melons have rounded surfaces, the second layer in a load will naturally stack in the space between two of the rows in the first layer. In arranging the melons, follow the same plan as used in packing oranges or apples in orderly rows in a box. In order to avoid walking on the melons while packing them, the full number of layers has to be completed as the work proceeds from one end to the side doors of the car or from front to rear of truck. When the side doors of the car are reached, start loading from the other end of the car. Load doorway last. Use straw or excelsior to fill in vacant spaces between melons.

WATERMELON VARIETIES

The type of watermelon now preferred for shipping is a heavy melon oval to long in shape, with firm red flesh and a tough rind that withstands handling well. Other demands are for melons of better quality, with fewer seeds and with sweet flesh free from fibers and water cores. Plant breeders in recent years have given special attention to developing high-quality varieties resistant to the wilt disease (*Fusarium niveum* E.F.S.).



Two types of watermelons, elongated and oval. Some growers and markets prefer one type, some the other. (Fig. 5)

While it is not practical to list all the varieties commonly grown, some of the latest and most important now in use are included here, and their particular merits indicated. Among those listed, the following are grown extensively in Illinois and enjoy considerable popularity: Dixie Queen (sometimes confused with Cuban Queen and also called White Seeded Cuban Queen), Wilt Resistant Hawkesbury, Florida Giant (also known as Black Diamond or Cannon Ball), Blacklee, Leesburg, Twilley's Wilt Resistant (not described here, as seed source is somewhat limited), Honey Cream (a novelty melon having a yellow flesh, seed source limited).

Long Melons

Tom Watson. An oval to long, dark green, slightly ribbed melon of fair quality. Although this variety used to be a leader in the shipping industry, it is now giving way to others of better quality.

Kleckley Sweet. Also known as the Monte Cristo, this variety closely resembles Tom Watson in size and shape but is not a good shipper. It is grown extensively for home use and for nearby markets.

Blacklee. Developed by the Florida Experiment Station. Vines are vigorous and very resistant to Fusarium wilt. Fruits are of Tom Watson type but somewhat thicker and shorter; rind is dark green and thin but tough; flesh is bright red and of good texture. Seeds are black and of medium size.

Leesburg. Similar to Kleckley Sweet from which it was derived but more blocky in shape. Rind is medium dark green, smooth, faintly grooved, and thin but tough. This variety is good for home use or local market. Developed especially for soils infested with Fusarium wilt.

Klondike. Cylindrical in shape, medium in size. Has dark-green rind with shallow ribs; bright deep-red flesh of excellent quality. Very popular in western United States. A selection from this variety known as Striped Klondike has a light-green rind with dark-green striping similar to the Georgia Rattlesnake but should not be confused with it.

Hawkesbury. An early melon with a very thin, hard and tough gray-green rind. Black-seeded, with deep blood-red flesh of excellent quality. A popular Fusarium wilt-resistant variety in Illinois and sometimes called "Gray Shipper."

Round Melons

Stone Mountain or Dixie Belle. Large, almost round, with surface slightly corrugated. Medium-tough dark-green rind, red flesh, good texture. A good shipper, but flesh is inclined to crack when overmature.

Improved Stone Mountain #5. Resistant to Fusarium wilt, nearly round, dark-green rind, fairly tender, crisp red flesh. Becomes mealy when overmature, and rind is easily broken; hence not a good shipper but well adapted for local market and home use.

Cuban Queen. Round to slightly oval, with alternate light- and dark-green striping, giving a ribbed appearance. Seeds are brownish black, flesh is red and of good quality. A fine shipper.

Dixie Queen. Round to slightly oval, with rind of light green overlaid with dark green stripes. Blunt ends, thin tough rind, excellent flavor and quality. Similar to Cuban Queen, but differs in that the seeds are small and white and the flesh a rich scarlet, fine-grained and tender; the stripes are not as clearly outlined to give a ribbed appearance. This is an excellent melon both for shipping and for the local market.

There is considerable confusion between Cuban Queen and Dixie Queen, the names being used without distinction. Dixie Queen is the better melon and can be recognized by its deep red flesh and especially by its small white seeds. A strain resistant to Fusarium wilt is available.

Florida Giant (also known as Black Diamond and Cannonball). A large round melon with a black-green, shiny, glossy rind and no stripes. The blood-

red flesh is of excellent quality. The thin tough rind makes it a good shipper as well as a good local market melon. Very drouth-resistant.

New Hampshire Midget. A new introduction in 1951 bred at the New Hampshire Experiment Station for production in northerly latitudes. Probably adapted to northern Illinois home gardens. It is an "icebox" variety, very early in maturity, with a small but vigorous vine. The melon is about 6 inches in diameter and weighs up to 6 pounds. The flesh is red, slightly coarse and fibrous, and the seeds large, but the flavor is good. The variety is reported to be very susceptible to anthracnose.

DISEASE CONTROL

Many of the diseases of muskmelons and watermelons can be held under control by clean cultural practices, such as pulling and burning the diseased plants when the disease is first observed and by burning trash along the fence rows to kill the hibernating insects that transmit some of the diseases. Crop rotation, seed treatment, and spraying or dusting are other ways of reducing the chances of disease infection.

Treat all seed. As a precaution against certain seed-borne diseases, all melon seed should be treated in a bichloride of mercury (corrosive sublimate) solution. Dissolve 1 ounce of this chemical in 7½ gallons of water (or 1 tablet in 1 pint of water). Soak the seed in this solution for 5 minutes, rinse thoroughly in clean water, then spread out to dry. (*Use great care in handling this chemical—it is a deadly poison.*)

When the seed has dried, treat it with Semesan, Sperguson, or Arasan to protect seed and seedlings against soil rot and damping-off. Place the dry seed in a container with a tight cover and add one of these dusts at the rate of ½ teaspoonful to 1 pound of seed. Close the container and shake it until seeds are thoroughly coated with dust.

Bacterial wilt. The first evidence of this disease is a wilting of plants similar to that caused by lack of water. The plants die shortly after this symptom is noticed. The organism causing this disease is carried over winter in the body of the striped cucumber beetle, which is one of the principal agents in transmitting the disease. Control consists mainly of applying insecticides to kill this beetle, but it is also important to pull and remove diseased plants from the field as soon as symptoms of the disease appear.

Anthracnose. This is possibly the worst disease of watermelons. It occurs in every production region with the possible exception of California. It is a fungus disease, sometimes referred to as blight, and spreads rapidly in moist, warm weather. It can be identified by the

brownish-black circular-to-angular spots on the stems and leaves of the plants. These spots soon cause the leaves to curl, turn yellow, and die. Occasionally sunken decaying spots appear on the fruits.

The organism causing this disease lives in the soil for at least a year. It is therefore best to plant melons on clean land whenever it is available.

To control this disease in the field, dust or spray the melon vines with Dithane Z-78, Parzate, Zerlate, or a fixed copper fungicide when the vines start to spread. Continue this treatment every 8 to 10 days until 3 or 4 applications have been made. (*For more specific directions see the recommendations of the manufacturer.*)

Powdery mildew. This disease appears as a white powdery mold on the leaves of muskmelons. It has been reported as occurring on watermelons too, but in Illinois it is of importance only on muskmelons. The simplest method of control is to plant resistant varieties of muskmelons. Several have been developed that have fruit equal to any variety being grown, but unless these varieties are satisfactory from a market standpoint, Illinois growers will not want to use them.

Fusarium wilt. The wilt caused by *Fusarium niveum* E.F.S. is, in many sections, perhaps the most serious disease of watermelons today. This wilt prevents the growing of watermelons in many places in Illinois, but muskmelons are not attacked by this organism.¹

Wilt is first noticed when occasional plants show signs of wilting, followed in a day or two by drying and death. When the stem is cut crosswise, a distinct brown ring can be seen, and in more advanced stages the whole interior is discolored. Other plants may appear to be entirely normal, but when closely examined they will show slight symptoms of the disease. Such plants are said to be "tolerant" to the disease since they withstand the fungus without losing much vigor.

Fusarium wilt cannot be controlled by sprays, but the following steps may be taken to reduce the danger of infection:

Grow melons on land where the disease has not previously been known.

Rotate the crops.

Use land that has not been in watermelons for at least ten years.

Or plant one of the wilt-resistant varieties that have been developed.

Root knot. This "disease" of watermelons and muskmelons rarely bothers Illinois growers except when plants are started in greenhouses. It appears as galls or swellings on the roots and is due to small eel-

¹ Another strain of *Fusarium* causes wilt of muskmelons but not watermelons; but this form is not common in Illinois.

worms, or nematodes, that feed on the roots, thus causing these abnormal growths. Infected plants are dwarfed and fail to mature their fruits. The most practical way to prevent or control this trouble is to rotate the melon crop with other crops such as corn, potatoes, beets, onions, cabbage, cereals, and grasses, or to plant melons on land known to be free from eelworms.¹

Stem end rot. This disease is of little importance in the northern states but in southern regions, where melons are shipped long distances, it is especially destructive. Spores from diseased melons in the field enter the cut stems of the melons that are being shipped, and cause rotting.

To reduce the danger of stem end rot developing on melons in transit, use clean cultural methods in the field and treat the stems with bluestone-starch² paste before shipping the melons (this paste can be bought already prepared).³

INSECT CONTROL

The four insects described here are the main ones that are a problem in melon growing in Illinois. All damage the crop by feeding on the plants or the fruit at one stage or another. One of them, the melon aphid, is known to spread mosaic disease. Thus insect control serves two purposes: it protects the crop against damage done by the feeding of insects, and it protects against disease.

Striped cucumber beetle. This insect is undoubtedly the most widespread pest of both watermelons and muskmelons. It is a yellow and black striped beetle that attacks the young cotyledons and stems before the true leaves develop, often causing their death. Later they feed on the leaves, and also cause considerable damage by puncturing the ripening fruits.

Control of this insect is very difficult. Insecticides formerly used were chiefly dust repellents, and after each rain dusting would have to be repeated. Later, many growers found that rotenone or pyrethrum gave excellent control. Ordinary or technical DDT cannot be safely used, as it may stunt vine growth. However, growers might try meth-

¹ For more detailed information about this disease refer to USDA Farmers' Bulletin 1345, "Root Knot, Its Cause and Control."

² Bluestone is identical with blue vitriol, or copper sulfate.

³ For more specific information about stem end rot refer to USDA Farmers' Bulletin 1394, "Watermelons."

oxychlor or vine-safened DDT. The latter has been used with good killing effect on the beetle and no noticeable damage to the plants.

In using rotenone, pyrethrum, methoxychlor, or vine-safened DDT, follow the directions given by the manufacturer.

Melon aphid. Extreme reverse curling of the leaves, reduced vigor of the plant, and finally its death, is evidence that the melon aphid is present. On the underside of the leaf will be found very small tender-bodied insects that are about the same green color as the leaves. These insects cause damage by sucking the juices out of the leaves. They are also agents for spreading a virus disease known as mosaic.

The melon aphid is controlled to some extent by its enemies, such as the ladybird beetle and the larvae of this beetle, a syrphid fly, and an aphid lion. A fungus disease also attacks the aphids during warm, damp weather. Such natural methods of control vary markedly with seasonal conditions, and may have to be supplemented by treatments with an insecticide such as nicotine sulfate mixed as a dust or spray by one of the following methods (all measurements are level):

| | Small quantity | Large quantity |
|----------------------------------|----------------|----------------|
| Nicotine sulfate (40%) | 2 tablespoons | 1 quart |
| Soap | 3 ounces | 4-6 pounds |
| Water | 3 gallons | 100 gallons |

For a dust the following mixture is recommended:

| | Small quantity | Large quantity |
|----------------------------------|----------------|----------------|
| Nicotine sulfate (40%) | 2 tablespoons | 2 quarts |
| Hydrated lime | 1 pound | 50 pounds |

To obtain a good kill, nicotine dusts or sprays should be applied when the temperature is over 70° F. For more resistant insects the dose of nicotine sulfate should be doubled. The common enemies of the aphid — the ladybird larvae and adults, syrphid fly larvae, and aphid lion larvae — are very little affected by the nicotine dusts. That is why some of the control from this method is thought to be due to the fact that after dusting or spraying, there are more aphid enemies in proportion to aphids than there were before.

Cutworms.¹ Cutworms attack nearly all garden crops, especially when the plants are young and tender. Their habit is to cut off the plants at the surface of the ground. Early in the morning the worms can usually be exposed by digging in the soil near the freshly cut plant.

¹ For further information on cutworms see USDA Leaflet 2, "Cutworms in the Garden."

But to try to control the worms in this way would be out of the question — it would be very laborious and would necessitate replanting in order to replace the dead plants.

The use of poison bran is the best-known method of control. The bran can be mixed at home for use in the field. For small quantities use:

- ¼ pound paris green
- 5 pounds dry bran
- 1 pint of livestock molasses mixed with 3 to 4 quarts of water (use only enough of this liquid to make a crumbly mass)

Apply this poison in the evening since the worms are night feeders and the bait will be most attractive while it is moist.

For large quantities of poison bait use:

- 1 pound paris green
- 25 pounds dry bran
- 2 quarts molasses mixed with 15 to 30 quarts of water

Other directions are the same as given above.

(This bait is poisonous — take special care to keep it and all used containers away from poultry and other farm animals.)

Grasshoppers. Frequently this pest feeds on the melon itself, scarring the outside and seriously damaging the appearance of the mature melons. Inspect fence rows and ditch banks near the melon patch early in the season, and if small grasshoppers are in abundance spray these areas with 1 pound of chlordane in enough water to cover one acre. As grasshoppers migrate from adjoining fields, it may be necessary to repeat this treatment. In this way grasshoppers can be destroyed before they reach the melon field.

Table 1. — CANTALOUPE PRODUCTION IN ILLINOIS, 1935-1948^a

| Year | Acres | Production | | | Average price per crate | Farm value | |
|-------------------|-------|-----------------|--------------|------------------|-------------------------|------------|----------|
| | | Crates per acre | Total crates | Weight per crate | | Total | Per acre |
| 1935 | 1 200 | 50 | 60,000 | 60 lb. | \$.98 | \$ 59,000 | \$ 49.17 |
| 1936 | 1 500 | 60 | 90,000 | " | 1.12 | 101,000 | 67.33 |
| 1937 | 1 500 | 80 | 120,000 | " | .90 | 108,000 | 72.00 |
| 1938 | 1 600 | 80 | 128,000 | " | .75 | 96,000 | 60.00 |
| 1939 | 1 900 | 80 | 152,000 | " | .65 | 99,000 | 52.11 |
| 1940 | 1 900 | 80 | 152,000 | " | .80 | 122,000 | 64.21 |
| 1941 | 1 800 | 80 | 144,000 | " | 1.20 | 173,000 | 96.11 |
| 1942 | 1 300 | 70 | 91,000 | " | 1.65 | 150,000 | 115.38 |
| 1943 | 1 050 | 70 | 74,000 | " | 2.20 | 163,000 | 155.24 |
| 1944 | 1 300 | 80 | 104,000 | " | 1.70 | 177,000 | 136.15 |
| 1945 | 1 500 | 60 | 90,000 | " | 2.15 | 194,000 | 129.33 |
| 1946 | 1 800 | 64 | 115,000 | 70 lb. | 1.85 | 213,000 | 118.33 |
| 1947 | 1 400 | 55 | 77,000 | " | 2.80 | 216,000 | 154.28 |
| 1948 | 1 500 | 50 | 75,000 | " | 1.95 | 146,000 | ..... |
| 1949 | 1 600 | 65 | 104,000 | " | 1.90 | 198,000 | ..... |
| 1950 ^b | 1 700 | 60 | 102,000 | " | ..... | ..... | ..... |

^a Figures are from *Illinois Agricultural Statistics*, Illinois Cooperative Crop Reporting Service, Department of Agriculture, Springfield, Illinois, except those for 1949, which are from *Annual Summary of Truck Crops for Fresh Market*, Bureau of Agricultural Economics, U. S. Department of Agriculture, 1949. ^b Preliminary estimates.

Table 2. — WATERMELON PRODUCTION IN ILLINOIS, 1935-1948^a

| Year | Acres | Production | | Average price per melon | Farm value | |
|-------------------|-------|-----------------|--------------|-------------------------|------------|----------|
| | | Melons per acre | Total melons | | Total | Per acre |
| 1935 | 4 800 | 280 | 1,344,000 | <i>cents</i> 10.5 | \$141,000 | \$29.38 |
| 1936 | 4 900 | 210 | 1,029,000 | 11.5 | 118,000 | 24.08 |
| 1937 | 4 600 | 425 | 1,955,000 | 10.5 | 205,000 | 44.57 |
| 1938 | 4 800 | 405 | 1,944,000 | 10.0 | 194,000 | 40.42 |
| 1939 | 5 000 | 320 | 1,600,000 | 9.0 | 144,000 | 28.80 |
| 1940 | 4 300 | 275 | 1,182,000 | 10.0 | 118,000 | 27.44 |
| 1941 | 3 900 | 350 | 1,365,000 | 20.0 | 273,000 | 70.00 |
| 1942 | 3 400 | 300 | 1,020,000 | 22.0 | 224,000 | 65.88 |
| 1943 | 2 600 | 440 | 1,144,000 | 35.0 | 400,000 | 153.85 |
| 1944 | 4 400 | 350 | 1,540,000 | 27.5 | 424,000 | 96.36 |
| 1945 | 3 500 | 300 | 1,050,000 | 35.0 | 368,000 | 105.14 |
| 1946 | 3 500 | 340 | 1,190,000 | 23.5 | 280,000 | 80.00 |
| 1947 | 3 100 | 300 | 930,000 | 29.5 | 274,000 | 88.39 |
| 1948 | 2 700 | 350 | 945,000 | 34.5 | 326,000 | ..... |
| 1949 | 2 700 | 375 | 1,012,000 | 33.0 | 334,000 | ..... |
| 1950 ^b | 2 700 | 330 | 891,000 | ..... | ..... | ..... |

^a Figures are from same sources as those in Table 1. ^b Preliminary estimates.

