The onion industry in Pleasant Valley, Iowa

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The Onion Industry in Pleasant Valley, Iowa

A field of onions for seed. The development of a local strain and the selection of perfect mother bulbs from which to propagate are the corner stones of the industry.
SUMMARY

The Pleasant Valley district comprises approximately 500 acres devoted exclusively to onion growing.

The average size of farm is approximately 10 acres.

Ninety percent of the Pleasant Valley farmers are owners, compared with less than 60 percent for the state including Scott county.

It requires 220 hours man labor to produce an acre of onions. Seventeen hours used to prepare the ground, 87 hours to grow the crop and 110 hours to harvest and market it.

Approximately 50 percent of the total man labor is usually required in the month of August to harvest and market the crop.

Horse labor amounted to 62 hours per acre, which was used in preparing the ground and marketing the crop.

The crop is grown and marketed in the nine open months, leaving the winter months unoccupied.

This area produces approximately 200,000 bushels annually. The crop is widely distributed. The bulk of it, however, goes to the cotton belt.

The entire crop is marketed immediately after harvest.

The Red Globe and the Yellow Bottleneck are the two varieties grown. The former predominates.

Home grown seed is used almost exclusively.

Approximately 85 percent of the acreage is grown from seed; however, the introduction of set planters is rapidly increasing the acreage grown from sets.

The onion thrip is the most serious insect pest. Effective control measures have not yet been fully developed.

Onion smut is the most important disease and is being effectively controlled by the formaldehyde treatment.
A STUDY OF THE ONION INDUSTRY IN PLEASANT VALLEY, IOWA

BY A. T. ERWIN AND W. L. HARTER

The Pleasant Valley onion district in Scott county, Iowa, presents a striking example of crop specialization and intensive culture in contrast to the typical corn belt farming which prevails in this state. Approximately 500 acres are devoted exclusively to onions on a continuous crop basis, and much of the land has been devoted to this particular crop for decades. This is one of the oldest agricultural regions of the state.

In the following pages is presented a summary of a farm survey* of the onion industry of this region, including a study of the cultural practices, the problems of disease and insect control, cost of production, marketing, tenure and the seasonal distribution of labor.

EARLY HISTORY

In 1856, Henry Schutter, of German nativity, moved from St. Louis to Pleasant Valley to engage in onion growing. The first crop was sown broadcast. This rendered cultivation impossible. The land soon became foul with weeds and the enterprise was unprofitable. A hand drill was next invented by one of the growers which made it possible to space the plants evenly within the row and to secure a uniform distribution. Thus the control of the weeds, a vital factor in onion culture, was provided for.

At that time river transportation was in its heyday and the bulk of the crop was shipped by boat to St. Louis and New Orleans.

Later more German settlers moved in and engaged in the industry. Other crops were gradually crowded out until the entire region was given over to onion production. The development of the industry is probably due as much to the temperament and inclination of these people toward intensive farming as it is to any special advantages of environment.

ADAPTABILITY OF THE PLEASANT VALLEY REGION

TYPOGRAPHY

This area may be roughly described as a portion of the Mississippi flood plain. The main area is about one mile wide.

*Frank M. Lyle, a graduate student in horticulture, assisted in making the field surveys made in 1921.
Fig. 1. Map showing the area included in this study. Note the location of the residences along the paved highway which borders the foot of the bluffs. This is a better building site than the level onion land below as it provides natural drainage and is not so valuable for onion production. Many of the farms are long narrow strips a few rods wide extending from the highway to the river.

and six miles long. It begins at the village of Pleasant Valley on the north and extends to Bettendorf, a suburb of Davenport on the south. The Mississippi river constitutes the eastern boundary and the ridges, the western boundary. Most of the land is quite regular and varies but little in its topography. The onion producing area is not generally subject to overflow; indeed it is practicable to grow this crop on overflow land. The drainage is taken care of by subsidiary streams from the hills which cross the area.

SOIL TYPE*

Several types of soil are represented to a minor degree in the Pleasant Valley district. The dominant and important type, however, is the Bremer silt loam. The Bremer silt loam consists of a dark brown to nearly black mellow loam ranging from 16 to 22 inches in depth. It is underlain by a gray to brown or gray and yellow mottled silt loam to silty yellow clay loam, which extends to a depth of more than 36 inches. The Bremer silt loam contains in an acre of surface soil to a depth of 6 2/3 inches, approximately 1,300 pounds of phosphorus, 4,100 pounds of nitrogen and 52,000 pounds of organic carbon. This type of soil often shows a limestone requirement of about two tons per acre.

The Bremer silt loam is the second bottom or terrace soil occurring along the Mississippi river from Pleasant Valley to the

*The following statement relative to the soil types of the Pleasant Valley district was furnished the authors by W. H. Stevenson, Chief of the Soils and Farm Crops Section.
Muscantine county line. The topography is nearly level to level. Surface drainage is generally adequate altho tiling is necessary in some cases. The structure of both surface soil and subsoil is favorable to the retention of moisture. The Bremer silt loam is an important soil type owing not so much to its extent as to its productiveness. Most of it is under cultivation.

RAINFALL

The normal rainfall for this district is 32.4 inches and 60 percent of it falls during the growing season of the onion. Its distribution by months for the growing season is shown in table I.

<table>
<thead>
<tr>
<th>Month</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>2.14</td>
</tr>
<tr>
<td>April</td>
<td>2.70</td>
</tr>
<tr>
<td>May</td>
<td>4.13</td>
</tr>
<tr>
<td>June</td>
<td>4.08</td>
</tr>
<tr>
<td>July</td>
<td>3.41</td>
</tr>
<tr>
<td>August</td>
<td>3.61</td>
</tr>
<tr>
<td>September</td>
<td>3.22</td>
</tr>
<tr>
<td>Total</td>
<td>23.24</td>
</tr>
</tbody>
</table>

Its distribution by the decades of each month, a vital consideration during the growing season, is given in fig. 2.

The total rainfall has proven ample for this crop. There are, however, drouth spells, often of short duration, which occur at critical times and in some years materially reduce the yield. Supplementary irrigation was tried by Frank F. Schutter in cooperation with C. L. Fitch of the Agricultural Extension Department in 1916 as a means of bridging over these periods. A Skinner overhead system was used. The water was pumped from an open ditch adjoining the field. The irrigated tract yielded at the rate of 407 bushels per acre, and the check plot, or un-irrigated, 288 bushels. There was, therefore, an increase of 119 bushels per acre, or 42 percent. There was also an important difference in quality and a much larger percentage of

![Fig. 2. Normal rainfall by decades of each month for the growing season.](image-url)
the bulbs graded No. 1 from the irrigated plot. This experience represents a drouth year. In many seasons probably the outfit would not be used at all. However, many growers gave their opinion that supplementary irrigation would probably be good crop insurance, and on the average, would prove a profitable investment. Probably 75 percent of this level valley is well adapted to irrigation.

An adequate water supply is a first consideration in irrigation. The Pleasant Valley district has two possible sources either of which seems feasible. The one is to pump the water direct from the Mississippi and the other is to establish a diversion dam up the river at a point to secure a sufficient fall, and bring the water thru a canal. Since there is a very pronounced fall in the Mississippi river, the canal would probably not have to be a long one.

Equally as important as adequate water supply during the growing season is dry weather for the ripening period.

An example of the disaster which follows wet weather in harvest time was furnished in the season of 1915. Heavy rains at harvest time flooded the fields. The bulbs became water soaked and soft rot set in. A portion of the crop was sold at a heavy discount, while many fields were never harvested at all.

**TABLE II— MEAN TEMPERATURES**

<table>
<thead>
<tr>
<th>Month</th>
<th>Mean Temperature</th>
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<tbody>
<tr>
<td>March</td>
<td>35.7</td>
</tr>
<tr>
<td>April</td>
<td>50.2</td>
</tr>
<tr>
<td>May</td>
<td>61.3</td>
</tr>
<tr>
<td>June</td>
<td>76.6</td>
</tr>
<tr>
<td>July</td>
<td>75.3</td>
</tr>
<tr>
<td>August</td>
<td>73.1</td>
</tr>
<tr>
<td>September</td>
<td>65.3</td>
</tr>
</tbody>
</table>

**TEMPERATURE**

The annual temperatures of this region shows a wide range, the highest being 106°F and the lowest 27°. The mean annual temperature is 48.5°F.
The mean temperature by months for the growing season is shown in table II.

The mean temperature as shown by the graph, fig. 4, rises gradually, reaching its maximum in July and then receding.

The average date for the last killing frost of spring is April 22, and the first killing frost of autumn normally occurs on October 13; the interval being 174 days. The varieties of onions grown in the Pleasant Valley district require approximately 120 days to reach maturity. The average date of planting is April 10.

The minimum temperature for the germination of onion seed appears not to have been fully determined. In some preliminary studies made by the writer, 45° F. gave indications of being the minimum, and an optimum of 15 to 20° higher than this. It will, therefore, be noted that the experience of the growers in the field closely correspond with the laboratory studies, and that the customary time of planting is very close to the period when the seasonal rise in temperature crosses the 50° F. line. In other words, as far as the temperature required for germination is concerned, the seed is generally planted as soon as the ground is warm enough to insure germination. Herewith is presented the daily mean temperature for April showing its relation to time of planting.

**SUNSHINE***

In view of the important part which the sunshine plays, not only in providing the necessary heat but also in its relation to the processes of assimilation, the record by months for this region, as shown in the accompanying table III, is of interest.

<table>
<thead>
<tr>
<th>Month</th>
<th>Hours of Sunlight</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>242.2</td>
<td>65</td>
</tr>
<tr>
<td>April</td>
<td>211.4</td>
<td>78</td>
</tr>
<tr>
<td>May</td>
<td>295.5</td>
<td>77</td>
</tr>
<tr>
<td>June</td>
<td>323.8</td>
<td>71</td>
</tr>
<tr>
<td>July</td>
<td>282.5</td>
<td>63</td>
</tr>
<tr>
<td>August</td>
<td>298.0</td>
<td>70</td>
</tr>
<tr>
<td>September</td>
<td>232.6</td>
<td>62</td>
</tr>
</tbody>
</table>

*U.S. Weather Bureau.

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*Fig. 4. Normal mean temperature by decades of each month for the growing season at Pleasant Valley. It will be noted that the peak of the heat wave is reached on the average, during the fore part of July. (U.S. Weather Bureau.)

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Erwin and Harter: The onion industry in Pleasant Valley, Iowa

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COMMERCIAL ONION PRODUCTION IN THE UNITED STATES

The onion grows successfully over a wide range of territory. It is grown throughout the United States for home use. The bulk of the commercial crop is grown in three areas which may be roughly defined as follows:

District No. 1 lies mainly between parallels 38 and 45 and extends from New Jersey to Iowa. This region contains about 30,000 acres and it represents 55 percent of the area devoted to commercial onion production in the United States. The main supply of late onions and the bulk of the stored onions comes from this territory.

District No. 2 comprises Texas and Louisiana. It is largely devoted to early onions and to large, long-seasoned varieties of the Bermuda, Spanish and Egyptian types. Fourteen thousand acres are included in this district.

District No. 3 includes the Pacific coast of California, Oregon and Washington and contains approximately 10,592 acres. This region produces both early and late onions and it is also becoming extensively interested in onion seed production.

The remaining two percent of the commercial onion production is widely scattered throughout the Union.

ONION DISTRICTS IN IOWA

There are three important commercial onion producing districts in this state, namely, Pleasant Valley, in Scott county, St. Ansgar-Clear Lake region in Mitchell and Cerro Gordo counties, and the Amana settlements in Iowa and Johnson counties. The Pleasant Valley proper contains about 500 acres and the St. Ansgar-Clear Lake region has approximately 400 acres.

VARIETIES OF ONIONS GROWN IN PLEASANT VALLEY

The Red Globe and Yellow Bottle Neck are the two varieties grown in this district. Crops of the former are produced from seed and the latter from sets.

THE RED GLOBE ONION

The local strain of the Red Globe was developed many years ago by Henry Schutter and it is still used by a majority of the growers. This strain has been an important contribution to the industry. It is globe-shaped, of a deep red color, possesses good keeping quality, yields high under favorable conditions, and is a week to ten days earlier than the commercial strain of the Red Globe. Some of the growers have saved their own seed, making selections from this local strain, for over 30 years. When the bulbs are beginning to ripen the fields are inspected carefully and all bulbs which show a tendency to revert either
to a late type, or the original Weathersfield, are destroyed. Earliness is regarded as vitally important because the onion market usually returns the best price the forepart of the season and the growers find that the most successful way to combat the onion thrip is by early planting and by using an early maturing strain.

F. F. Schutter furnished the authors the following statement relative to the origin of the Pleasant Valley strain of the Red Globe onion:

"This locality carries the distinction of having one of the best early onions grown, especially with respect to globe-shape, desirable color, keeping qualities, and productiveness. This onion has been brought to this high state of perfection by careful selection for over 30 years.

"My father bought some extra early seed over 30 years ago from a Philadelphia dealer. The seed was early enough, but the onions were of poor color and about 90 percent were very far from globe-shape, being almost as flat as Weathersfield. By saving only the very best and earliest year after year, the color and shape have been improved.

"Usually our dry season, if we have one, begins about the fourth of July. These extra early onions nearly always make a better crop in a dry season than onions of a later variety. They mature from July 20 to August 1 according to climatic conditions.

"Every year about one acre is set aside for seed onions. When these are getting ripe the off-type onions are pulled up and carried off. From the balance, the very best bulbs are kept. This careful selection is not practiced by all the growers, but enough of them do this to keep the strain up to a high standard."

THE BOTTLE NECK ONION

This variety, tho widely grown for years past in the Pleasant Valley district, is but little known in the seed trade and does not appear to be listed in any of the American seed catalogs at the present time. The authors are indebted to Henry Kelling of Davenport, Iowa, for the following statement regarding its history and introduction.

Mr. Kelling was employed for years in a seed store at Davenport, beginning in 1875, and he was also interested in commercial onion growing in this region.

"In the late sixties a Mr. Lafrenz of Davenport who grew onions on a large scale went to Germany on a visit. While there he became acquainted with a variety of onion called 'Birn Zwiebel' (pear-shaped) and he secured some of the seed. There are two varieties of this type, one white, the other yellow. In
the present day catalog of Hagg & Schmitt of Erfurt, Germany, the yellow is described as oblong and sweet. Lafrenz would not part with any of his stock of the Yellow Bottle Neck the first few years, but later some growers on West Locust Street secured bulbs for propagation. By careful selection of the mother bulbs, it has been improved and acclimated and is today the best yellow onion in this region for sets. It is a good shipper and an excellent keeper. I have kept sets in my cellar until the fourth of July."

The Pleasant Valley growers favor the Bottle Neck variety for two reasons. When grown from sets, only a small percent become "pipers," that is, form seed stalks. It is also considered more hardy than the Red Globe. Under unfavorable conditions of a cold, wet season, there is less rotting of the sets after planting, and hence a more complete stand than with Red Globe.

**ONION INSECTS**

The growers regard thrip as the most serious insect pest of the onion in this district, because no effective remedies have yet been devised for its control. It is a microscopic insect which feeds by sucking the sap and its presence is indicated by the "white blast" areas on the foliage. Hot, dry weather in July and August is believed to be favorable for its propagation and spread. Spraying with nicotine sulfate has been tried by a number of the growers, as well as by Fenton and Horsfall,* without success, because the insect hides in the onion sheath on the leaf where it cannot be reached.

Early planting and the use of an early maturing strain is practiced by the growers because the crop can be gotten well along before the heated period of mid-summer when the thrips spread most rapidly.

The thrips carry over winter in the scales of the onion bulb and, therefore, the areas producing bulbs from seed are commonly placed on the upland in order to isolate them and to prevent the mother seed bulbs from becoming a source of infestation for the onion fields.

It has also been found that this insect winters over in onion

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tops and rubbish along the fence rows. Many of the growers, however, do not take the precaution to destroy these harbors.

The onion maggot, tho not reported by many of the growers, is found in this district. A survey to determine its prevalence and the extent of the damage it causes has not been made by the Department of Entomology. The onion maggot, in the opinion of Dr. Drake, is perhaps the most serious insect pest threatening the onion crop in Iowa today.

**ONION DISEASES**

The growers report smut to be the one outstanding onion disease of the Pleasant Valley district. This soil disease has become cumulative on account of the continuous cropping for a long series of years, and it has become seriously destructive where control measures are not used. The disease attacks the young seedlings, particularly at the germination stage. The affected plant takes on a yellowish cast of foliage and the leaves become twisted. Many of the plants are entirely destroyed, reducing the stand, while those which survive are largely worthless. The black fruiting spores appear just under the skin at the neck of the plant.

Fortunately, the disease is effectively controlled by the use of formaldehyde and every grower reported that he was using this treatment in the majority of cases with satisfactory results.

The formaldehyde is applied by means of a small tank attached to the drill. A tube connected with the tank and opening directly back of the shoe on the drill, is so placed as to provide a small trickling stream of the formaldehyde which plays over the seed as it drops into the furrow. The formaldehyde is diluted with water, the amount of dilution depending somewhat upon the speed with which the planter is operated. As a rule it is diluted in the proportion of one pint of for-
maldehyde to 25 gallons of water, and approximately 20 pints of formaldehyde are required to treat an acre.

In most of the older onion fields this disease has become thoroughly established and it is so serious in its ravages that without the formaldehyde treatment it is doubtful if this onion district would exist today. The importance of the smut treatment in this region is shown in the following instance. In 1920, by arrangement with the authors, certain rows in a field in which onions have been grown continuously for years, were not given the formaldehyde treatment. At harvest time the average stand on the untreated rows was three mature onions to the foot compared with seven to the foot on the treated rows. The total yield of No. 1 grade from a portion of the treated plots was 100 bushels in contrast to 40 bushels of the same grade from the untreated. The proportion was five to two. This represents an increase of 60 percent from the formaldehyde treatment.

**HOME GROWN SEED USED**

A high grade of seed is produced in Pleasant Valley and practically all of the seed used is grown locally, 23 percent of the farmers grow their own supply and 77 percent buy of their neighbors. This practice is favored because it not only insures getting the right variety, but it also enables one to select a type which matures at a favorable time in relation to the market and weather conditions of the harvesting season in this region. Medium sized, typical shaped and well colored specimens are carefully selected for mother bulbs.

The furrows for seed onions are lined out for planting with a one-horse plow. The bulbs are planted about four inches deep, leaving a space between them equal to their diameter. Many growers prefer the thinner uplands for the seed production, believing that the crop of seed is heavier. As thrips are carried over in the bulb scales, there is a further advantage in isolating the seed patch from the main field.

In cultivating, the soil is worked toward the bulbs to assist in supporting the seed stalks. The seed is gathered by hand just before it begins to shell. The seed clusters are not cut until mature, which may necessitate two or three harvestings. The seed is threshed out with a flail and cleaned by the fanning mill.

In the neighborhood of 150 bushels of mother bulbs are required per acre, and under favorable conditions from three to four pounds of seed may be expected from each bushel of mother bulbs. Five hundred pounds of seed per acre is regarded as a good crop.
Fig. 7. An onion thresher designed somewhat along the lines of the old-fashioned "ground hog" separators. It does much more efficient work than the hand flail which is commonly used. This outfit was invented by a local grower.

CULTURAL METHODS

The preparation of land for onion growing differs materially from that for any other crop in two respects. First, there is the eradication of weeds from the soil which usually requires from two to three years. Second, there is the long period of continuous cropping which is followed after land has been properly prepared.

FERTILIZERS

Barnyard manure was generally used in former years as fertilizer, but with the advent of the auto the supply has rapidly diminished, and at the present time is seriously inadequate. A limited supply is still available locally and some of the growers contract to handle manure from the stables of Davenport. This affords winter employment and provides the best available fertilizer for onions. The manure is first composted to kill weed seeds. It is applied at the rate of from 12 to 15 tons per acre every second or third year.

On account of the increasing scarcity of barnyard manure the use of chemical fertilizers is rapidly increasing. So far as possible, however, the growers plan to use it as a supplement to stable manure rather than as a substitute for it.

PREPARATION OF THE LAND

In order to facilitate early planting, fall plowing is universally practiced. Great emphasis is placed on freeing the land
from weeds. J. P. Johansen, a veteran grower of Pleasant Valley says: “Corn is one of the best crops to grow to prepare the land for onions at the least expense. Cultivate and clean the ground thoroughly after the corn is harvested so as to remove weeds and corn stalks. There will even then be many weeds for the first two or three years and the returns during this period will be small, not more than common wages.

“You must raise onions for years to make it pay because it takes years to get the land clean of all weeds.”

Considerable time and expense are involved in preparing land for profitable onion culture. On the other hand, once prepared the land can be continuously cropped for many years if fertilized. Few vegetable crops will stand continuous cropping as do onions. There are fields in the Pleasant Valley district which have grown onions continuously for a third of a century and over, which are still productive.

FALL PLOWING

The onion is distinctly a cool season crop. The seed germinates at a low temperature and experience has proven that in the corn belt the crop should be planted early in order to be well grown before the hot dry weather of late July and August.

The land is either sown to a cover crop or plowed at once and left in the rough over winter. This exposes the larvae of insects to the action of the elements, and also mellows up the soil due to the freezing and thawing. During the last year or two several farmers have used tractors for plowing. Where the fields are of suitable size and shape, this method will probably become quite popular, because many hire the plowing done. The majority use a single bottom plow, which requires the time of a driver and two horses five and one-half hours per acre.

DISCING

A disc harrow is commonly used for pulverizing the soil. As shown by the table this requires three hours for a man and team.

HARROWING

It will be noted in table VIII (page 285) that more time is spent in harrowing than in plowing. This is explained by the fact that there may be from three to five harrowings during the year. The ordinary spike-tooth and Acme harrows are used. The Acme is quite a favorite in this community as it destroys weeds effectively and leaves the ground smooth. Six and one-half hours with a team are required for this operation.

CLODDING

The seed bed for onions must be fine and firm. When weather conditions have not been suitable for providing this, it becomes
necessary to use extra care to secure this condition. For this purpose a clod crusher is used. This equipment is easily constructed. It consists of a number of 2"x12" planks spiked with the front edge of one lapping over the rear edge of the one in front of it. No more land is floated each day than can be planted. This insures a moist seed bed. An acre can be clodded in about two hours.

SEEDING

A two-row planter, which is a local invention, is commonly used.

The date of planting ranges from April 1 to 20. April 10 represents, on the average, the peak of the planting season. The amount of seed required per acre varies from 3½ to 4½ pounds, the average being four pounds. The rows are 12 inches apart and the drills are set for a one-inch spacing within the row. Care is exercised not to step on the rows just planted. Under normal conditions a man can plant an acre per day.

HAND WEEDING

Hand weeding directly in the rows is the largest and most important operation involved in the commercial production of onions. Onions will not return a profit unless the field is kept absolutely free from weeds. It must be clean, using the term in the strictest sense, and not in the relative way usually applied to farm crops. The most successful growers in the Pleasant Valley district make it a practice to pull the weeds before they set seed and carry them off the field. The matter of weeding and the expense involved in this operation often determines the profit or loss involved in growing a crop of onions. This fact is strikingly illustrated in a report made to the authors by Frank F. Schutter: "In 1856 my father moved to Pleasant Valley from St. Louis and began farming on a small scale, raising a few onions. He saw at once that if there was to be a profit in onion growing, one man must take care of more than two acres, which is about the limit in weedy ground. He, there-

Fig. 8. The two-row drill invented by a local grower. It weighs but little more than the ordinary one-row machine. Has the advantage of high wheels and broad tires which reduce the tractive resistance and also increases the speed.
fore, began to carry off every weed and to keep the ground clean of weeds after the crop was harvested. Not a single weed was allowed to mature. In a few years he found that one man could care for four of five acres instead of two. Since that time, with the introduction of a double wheel hoe, one man can care for as high as eight acres. This is where your profits begin to come in—eight acres, against two for one man.

"The two important factors in profitable onion culture are, first, getting the ground absolutely free of weed seed and keeping it so, and second, using the right kind of seed."

The weeding season opens shortly after planting and continues until the period of killing frost in the autumn. Most of the weeding is done by hand and to quite a large extent by women and children. A certain amount of care must be exercised, but the cheapest and most inexperienced labor is employed in this operation. An average of 44 hours of hand labor is expended per acre on weeding old fields in the Pleasant Valley district.

Machine weeders, which have recently been introduced, and which are being advocated in certain sections, are not looked upon with favor by the Pleasant Valley growers and are not used in this territory.

**WHEEL HOEING**

Wheel hoeing is carried on at the same time and in connection with weeding. This operation is begun when the onion
plant first appears and is continued until the crop is harvested in the fall. The wheel hoe is kept moving all the time when the ground and weather will permit. From five to seven hoe-  
ings are required to keep the weeds down and the ground in good condition. It is also the aim of the growers to cover the field once a week and also after each rain.

A limited amount of cultivation is given after the bulbs begin to mature. Level culture is practiced throughout the season as the growers deem it inadvisable to have the bulbs either in a furrow or on a ridge. A number of different attachments for the wheel hoe are used to suit the requirements as the crop develops.

On an average about 34 hours man time is required per acre for the wheel hoe during the season.

**HARVESTING AND DISPOSITION OF THE CROP**

**YIELDS**

Onion yields in this district fluctuate widely and are influenced particularly by climatic conditions especially rainfall. In general, the production ranges all the way from 200 to 400 bushels per acre, with occasional records for better than 1,000 bushels per acre on fertile patches and with favored seasons. Herewith is presented the records of a representative grower who has kept a careful accounting on a field averaging 14 acres, and for a period of 29 years.

The average in this instance for the period named was 414 bushels per acre. In general, the growers regard from 350 to 400 bushels as an average yield in a normal season.

**TABLE IV—YIELD OF ONIONS FROM THE FIELD OF FRANK SCHUTTER, PLEASANT VALLEY, IOWA**

<table>
<thead>
<tr>
<th>Year</th>
<th>Bu. per acre</th>
<th>Year</th>
<th>Bu. per acre</th>
</tr>
</thead>
<tbody>
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<td>1895</td>
<td>310</td>
<td>1910</td>
<td>271</td>
</tr>
<tr>
<td>1896</td>
<td>180</td>
<td>1911</td>
<td>178</td>
</tr>
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<td>230</td>
<td>1912</td>
<td>550</td>
</tr>
<tr>
<td>1898</td>
<td>370</td>
<td>1913</td>
<td>250</td>
</tr>
<tr>
<td>1899</td>
<td>714</td>
<td>1914</td>
<td>330</td>
</tr>
<tr>
<td>1900</td>
<td>550</td>
<td>1915</td>
<td>625</td>
</tr>
<tr>
<td>1901</td>
<td>214</td>
<td>1916</td>
<td>357</td>
</tr>
<tr>
<td>1902</td>
<td>432</td>
<td>1917</td>
<td>401</td>
</tr>
<tr>
<td>1903</td>
<td>478</td>
<td>1918</td>
<td>714</td>
</tr>
<tr>
<td>1904</td>
<td>478</td>
<td>1919</td>
<td>214</td>
</tr>
<tr>
<td>1905</td>
<td>628</td>
<td>1920</td>
<td>362</td>
</tr>
<tr>
<td>1906</td>
<td>564</td>
<td>1921</td>
<td>272</td>
</tr>
<tr>
<td>1907</td>
<td>557</td>
<td>1922</td>
<td>414</td>
</tr>
<tr>
<td>1908</td>
<td>356</td>
<td>1923</td>
<td>445</td>
</tr>
</tbody>
</table>

**PULLING**

The harvest season usually opens about August 1 and is commonly completed by the first of September. In early seasons
it may be five days to a week in advance of the above date. The onions are harvested as soon as about two-thirds of the tops are dead. The tops fall over before the bulbs are full weight and if left in the ground for a few days longer they gain materially in weight, thus adding to the yield.

Lifting the bulbs is the first operation in harvesting. A U-shaped knife attachment on the wheel hoe is used for this purpose. This is run under the row cutting the roots and lifting the bulbs.

In some cases the bulbs are pulled by hand, especially if the soil is inclined to be wet. The average time required for lifting one acre with a wheel hoe is 10½ hours, and a little more than this where hand pulling is practiced.

CURING

The bulbs are next raked into windrows by drawing together from five to eight seed rows. They are left in the windrows from two to three days for curing. In the case of white varieties, however, it is necessary to do the curing under cover in order to avoid sunburn. For this reason the white varieties are more expensive to produce and are not favored by the growers.

Should a rain occur at this time it is necessary to turn the windrows with a hand rake in order to prevent the onions from taking root and sprouting.

TOPPING

Topping is the first step in preparing onions for the market. The crop is ready for topping as soon as the leaves have died down, which takes place during the curing.

Topping is done by either hand or machine. During the war topping machines found favor on account of the scarcity of labor. In times when labor is plentiful at a reasonable figure, hand topping is preferred to the machine, for the reason that the bulbs are bruised less and therefore keep better. Also, if the tops are a little wet or green the machines do not work so well. Some growers regard the investment in a machine as profitable even tho they use hand labor exclusively, because it helps to keep the laborers in a reasonable frame of mind.

Since each bulb must be handled individually, topping is a slow operation and entails more time than any other single operation in the handling of an onion crop, with the exception of weeding. The number of bushels an operator can top per day depends much on the size of the bulbs. In 1921, for example, the crop was rather light and the bulbs undersized. For that year the average operator topped 33 bushels per day. On the other hand records of 100 bushels per day were reported
for the most skilled operators in exceptionally good years. It requires, on the average, 65 hours of man labor per acre for topping.

GRADING AND SACKING

After being topped, the onions are placed in crates or bushel baskets. Within the past two years the baskets have practically displaced the crates, because they are more convenient to handle in filling the sacks.

Two grades are commonly used in the Pleasant Valley district, No. 1 and No. 2.

For No. 1 grade a one and one-half inch screen is used and for No. 2 a one and one-eighth inch screen is required. Sound onions of similar varietal characteristics and which are free from "bull necks," sprouted onions, disease, mechanical injury and reasonably free from dirt and foreign matter, are required for both grades.

The type of screen used is made of half round pieces properly spaced. The material for a home made outfit costs about ten dollars.

Sacks are used exclusively for shipping. One hundred pounds rather than the bushel, is used as the unit of measure. The wide variation in different states as to what constitutes a bushel, has fortunately forced the adoption of the hundred weight unit.

The sacks are filled to weigh 102 pounds with a guaranteed delivery within two percent.

Twine paper and burlap sacks are used. The twine paper sack makes a more attractive package, in fact commands a pre-
mium of 10 cents per hundred on some markets. On the other hand, the bottoms will drop out if they get wet and since the Pleasant Valley growers cure their crop in the sacks in the field, the burlap container has proven the only safe one to use.

On the average one man will grade and sack 15 bushels per hour; sacking, therefore, requires approximately 27 hours per acre.

HAULING

The hauling is done when the onions are placed in the car. The time element here is, of course, proportioned to the yield or number of sacks per acre and the distance to be hauled. The average length of haul in the Pleasant Valley district is about one and one-half miles. At that distance it requires about 8 man hours and about 16 hours of horse labor. Two men can work to much better advantage in loading than can one working alone.

GROWING ONIONS FROM SETS

The preparation of the land is the same for sets as for seed. The ordinary method of handplanting sets involves a large amount of labor, from 10 to 12 men being required to plant one acre a day. In the Pleasant Valley region machine setting has almost entirely displaced hand planting. Two different machines have been invented by local growers, both of which are reported as giving satisfactory results.

The Pleasant Valley growers were the first in the United States to develop and use machine set planters. One man with a machine can plant one acre a day. These planters drop the sets in such a manner that the tops are always up. The bulbs are evenly spaced and the heads all point in the same direction and at an angle of about 45 degrees. It is necessary that the bulbs be carefully sized over the screen to secure even spacing. The acreage grown from sets by each grower ranges from one to four acres, the average being two acres. These are grown for the purpose of getting on the market in advance of the main crop of seed onions. This provides cash for the expense of harvesting the main crop.

The sets used are almost all home grown. Each farmer plans to grow the.

Fig. 11. Onion set planter. A two-row motor-driven outfit doing the work of twenty men. This and a one-row set planter, both local inventions, represent the highest mechanical expression of skill in onion production.
sets he will need the next year. Sets are very often used the first year or two a new field is planted to onions. They can be grown on land not quite free from weeds. The freeing of the land of weeds can be carried on much cheaper where sets are used more than when grown from seed.

The sets are graded into two sizes. No. 1 is above one-half inch and under three-fourths inch. It requires from 25 to 30 bushels of No. 1 grade of sets to plant an acre and from 20 to 22 bushels of No. 2 grade.

**STORAGE**

The entire crop from the Pleasant Valley region is marketed immediately following the harvest. No storage facilities are required. As will be noted under the discussion on marketing, page 278, the price gradually declines during the late summer and autumn. An early market is, therefore, a strong inducement and the growers of this region are fortunately situated climatically for the maturing of their crop in time to reach the main early market.

**MARKETING**

The output from the Pleasant Valley district approximates 400 to 500 cars a year. The crop is marketed thru two general types of selling agencies. A cooperative marketing agency known as the Pleasant Valley Onion Growers' Association was established in 1910. The association is purely co-operative and no dividends declared. Membership is restricted to actual growers. The membership fee is one dollar. The association reserves the right to handle the entire crop of its members unless specific permission is granted otherwise. The association charged 10 percent of the gross sale price for marketing until 1917, since which time it has charged seven percent. One-half of one percent of the commission charge goes to the general fund and an equal amount to a sinking fund. The general fund takes care of the general office expenses. The sinking fund is used to pay any losses in transit or damages to cars up to 60 percent of the sale price of the car. The remaining six percent of the commission charge pays the salary of the general salesman, who is paid on this basis rather than a flat salary. Since its inception the association has handled the majority of cars shipped, in some years as much as 70 percent of the total output.

The remainder is sold thru commission agencies, some of whom charge a flat rate of $15 a car, while others charge upwards of 10 percent. Within the past two or three years a larger percentage of the crop was handled thru the commission firms than formerly.
Practically all sales are made on a car lot basis. Formerly the bulk of the sales were made f. o. b. Pleasant Valley. Within the past five years this method has been giving way to the practice of billing "rollers" or "tramps" which may be diverted before reaching their original destination.

The onions are inspected when loaded into the car. If a grower can load a car within 24 hours he has the privilege of an individual car. Twenty-five thousand pounds, or

250 bags, constitute a minimum car.

TRANSPORTATION

In earlier years the crop was transported by boat. The destination was mainly St. Louis and New Orleans. Now it is all handled by the railroads. Two steam and one electric line traverse the valley giving the shipper contact with other transportation systems. Since storage is not practiced, marketing is usually completed by September 15.

DISTRIBUTION OF PLEASANT VALLEY ONIONS

Pleasant Valley onions are distributed over a very large territory. Most of the Red Globe variety are shipped to the south; many go to New Orleans, Baton Rouge and Miami.

The Yellow BottleNeck are shipped to the northern and eastern markets. Un-

Fig. 1. Loading onions at Pleasant Valley. The bulk of the crop goes to the cotton belt.

Fig. 13. Distribution of Pleasant Valley onions in 1921. Each dot represents one car load.
til the growers of this district started growing some yellow onions they had very little chance to get in the northern and eastern markets. In 1921 quite a few cars were shipped direct to the largest onion producing states of the north and east. Louisiana is the heaviest user of Iowa onions. Shipments going to New Orleans amount to 15 percent of the total. Baton Rouge is also an important center of consumption. Missouri was second in consumption of Iowa onions, with St. Louis as the center. Shipments there totaled 11 percent. Kansas City and St. Joseph use several carloads each. Illinois is third with shipments going to Chicago, Galesburg and Cairo. Chicago received by far the most. Shipments went as far west as Topeka, Kansas, and east to Rochester, New York. The most distant point of shipment was Miami, Florida.

PRICES TO GROWERS

As noted in the previous discussion, the onions from this district are sold immediately rather than stored. As indicated by the accompanying graph, showing the price range for the year, peak prices are commonly reached in May or June and gradually recede until September, when the market may run steady for some time.

It is therefore obvious that cultural practices or earlier strains which enable the grower to gain 10 days or two weeks in reaching a market which is usually declining at that season are important considerations. Furthermore, since he can reach the market in advance of the heavy fall movements of onions, his logical course is to sell rather than to store, tho there are
no doubt important exceptions. The early market is keener, the crop moves more freely and with less competition from the Racine district which follows Iowa closely on the market.

**FARM ORGANIZATION**

**TENURE**

In striking contrast to the general trend in the corn belt, Pleasant Valley has a low percentage of tenants. While Iowa has 41.7 tenants per hundred and Scott county 44.7, Pleasant Valley has only 10 tenants for each hundred farmers.

This low percentage is explained in the fact that onion farms are small and require a relatively small investment in land. Onion growing, like all other intensive types of farming, requires a heavy expenditure of labor per acre, thus reducing the relative importance of land. Even if onion land is high in price a man with a few thousand dollars' capital can buy a few acres and conduct a fairly large business as an onion grower. This opportunity results in a very low percentage of tenancy in Pleasant Valley.

Of the farms included in this study, only 10 percent were operated by tenants. Most of these rented on shares, giving from one-third on new land to one-half on land thoroughly fitted for onions. These rentals return the landlord as high as 10 percent interest on land valued at $1,000 an acre. This high rental adds to the tenants' desire to buy land when the mortgage rate of interest is 5 to 6 percent. The average size of the farms operated by tenants was 7.5 acres, compared with slightly less than 10 acres for owners. One man rented three acres, another 15 acres. Since the farms are small and require so little horse power, the renters usually hire the ground plowed and fitted. The landlord does this sometimes, and his horses are used for marketing the crop. The owner of the team furnishes the implements. The tenant's investment in tools and machines is quite small, ranging from $75 to $100. This will buy the hand planter, wheel hoes, and other small tools needed. Seed and sacks are usually furnished jointly in proportion to the share of rent each receives. The landlord usually furnishes the fertilizer when any is used.

**SIZE OF FARM**

It is common knowledge that the American farm, like that of other nations, is a family sized farm. This is quite generally true regardless of type. The size of the farm, then, tends to be determined by the number of workers in the family and the acreage each can cover in view of the type of farming in question.
From 8 to 10 acres of onions furnishes the farmer and his family with work from planting until the crop is ready for market. Even this acreage requires extra hand labor at the peak of the weeding season and at pulling and topping time. The average acreage in onions for the 35 farms surveyed was 9.7 acres. One man had 26 acres; other fields ranged in size down to one acre. This small acreage does not occupy the full time of the operator and usually part of his time is spent working for neighbors who need extra help. In some cases a farmer raises some feed crops on adjoining upland, which is not suitable for commercial onion production. Some of the men who have but small farms increase the size of their business by growing seed and more frequently by raising sets.

About 50 percent of the farmers keep one or more milk cows. Very few have any hogs since they do not raise any feed. Most of the farmers keep some chickens, the number ranging from 25 to 300. It would seem wise in many cases to increase the volume of the farm business by enlarging the poultry enterprise, which would furnish some employment during the part of the year when the onion crop does not demand the operator's time. Among the farms surveyed, several would have lost money during the dry year of 1921 had it not been for the poultry they kept.

COST OF PRODUCTION

The cost of producing onions, like the cost of producing any other crop, is determined by many varying factors. The items entering into production are use of land, seed, fertilizer, formaldehyde, sacks, man and horse labor, use of equipment and marketing. An effort was made to determine as definitely as possible the amounts of these various items. Some of the men from whom data were secured had kept good records, but most of them could give only careful estimates. No data were gathered from men who had not been growing onions at least five years. Many had had from 10 to 20 years' experience, and it is therefore safe to conclude that their careful estimates coincide closely with the facts. The following table shows the items entering into production with values assigned thereto for the year 1921:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost per Acre (1921)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>6% of $892 $53.52</td>
</tr>
<tr>
<td>Use of equipment</td>
<td>7% of $54 $3.78</td>
</tr>
<tr>
<td>Seed</td>
<td>4 lbs. at $1.50 $6.00</td>
</tr>
<tr>
<td>Barnyard manure</td>
<td>12 ton at $1.00 (alternate years) $6.00</td>
</tr>
<tr>
<td>Man labor</td>
<td>220 hrs. at 35 cents $77.00</td>
</tr>
<tr>
<td>Horse labor</td>
<td>62 hrs. at 15 cents $9.30</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>10 lbs. at 20 cents $2.00</td>
</tr>
<tr>
<td>Sacks</td>
<td>200 at 8 cents $16.00</td>
</tr>
<tr>
<td>Marketing fees, commissions, etc.</td>
<td>$9.25</td>
</tr>
<tr>
<td>(Some dealers charge a flat rate of $15 per car)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$182.85</td>
</tr>
</tbody>
</table>
With a yield of 400 bushels per acre the cost is approximately 45 cents a bushel.

If sets are used instead of seed, the cost of producing an acre is increased by about the additional cost of sets over seed, but the yield is usually increased resulting in approximately the same cost per bushel. Sets are best for use on ground not thoroughly subdued.

The average value of land in onions was $892. This figure represents the average of estimates of growers and records taken from the county recorder’s books. Of a total of 14 sales on record in the auditor’s book for this area for the past five years, five ranged in value from $400 to $800 an acre, four between $800 and $1,000, while two were sold for more than $1,500 an acre. Three transfers of adjacent upland farms ranged in price from $150 to $300 per acre.

The mortgage rate of interest was 6 percent. Interest rates on short time loans were $6\frac{1}{2}$ to 7 percent. From 3 to 4 pounds of seed are used per acre and the value ranges from $1.50 to $2.00 a pound. Farmers try to apply a covering of about 12 to 15 tons of barnyard manure every other year. It was valued at $1.00 a ton.

Labor was valued at 35 cents an hour as that was the prevailing price where hired. Horse labor was valued at 15 cents per hour for the same reason. These prices will vary from year to year depending on economic conditions. Obviously the cost of sacks per acre will vary with the yield. The cost was based on a 400 bushel yield which would require 200 sacks valued at 8 cents each.

Marketing costs also will vary with the yield and price since the sales organizations are run on a commission basis. This is explained in a later discussion of Marketing Agencies.

VARYING COSTS OF PRODUCTION ON DIFFERENT FARMS

Among onion growers, as among men engaged in other lines of industry, one finds varying degrees of success. In general, onion growers realize profits comparable with corn belt farmers. Large labor incomes are realized by successful men and small incomes by those who fail to provide the necessary combination of diligence and business ability. On the farms studied, costs varied from as low as $91 per acre on one farm to as high as $235 on another. On the farm which produced at a cost of $91 per acre, only two acres were grown. The land was exceptionally free from weeds, requiring much less labor than most fields, and much of the labor was done by the farmer’s children. If this
had been charged at the regular rate of 35 cents an hour, the cost would have been much higher. On the farm producing at a cost of $235 an acre, twelve acres were grown on ground not previously freed from weeds. This resulted in a high labor cost as is always the case on new land. Another factor adding to the cost was the purchase of $180 worth of sets to plant on weedy ground. The average cost for all farms was approximately $180 per acre. Obviously, high cost of production results in low income, unless the yield is correspondingly increased. The figures show that those who had high production costs realized lowest labor incomes.

Production costs usually are high on new ground which is being subdued. This is, of course, unavoidable. Weeding must be done at the proper time or the cost will be greatly increased by the added difficulty of removing the weeds when grown larger.

The labor incomes* realized by these farmers ranged from $62 in the case of a man with one acre, to $2,436 earned by a man with 22 acres.

COST OF SEED

Twenty-three percent of the farmers in this area grow seed for their own planting. The other 77 percent buy seed which is produced locally. There are some who increase the volume of their business by specializing to some extent in seed production. Somewhat cheaper land can be used for producing seed than is needed for producing bulbs. Mature bulbs are planted at the rate of from 100 to 150 bushels per acre at a cost of about $1.50 to $2.00 per bushel. Since the young onion plant grown from seed is very tender and needs every advantage on fine, clean soil, it is common practice to continue the production of market onions on the same ground when once it has been thoroughly fitted. The mother bulbs from which seed is produced, largely by the stored up food in the bulb itself, are more hardy and produce good seed on soil not so rich or so free from weeds; hence, a cheaper grade of land may be used. In fact much of the seed is produced on uplands or hillsides where values range from $150 to $300 per acre.

The labor of planting bulbs for seed production is consider-

<table>
<thead>
<tr>
<th>TABLE VI—COST OF PRODUCING ONE ACRE OF SEED—1921</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on land*</td>
</tr>
<tr>
<td>Interest on equipment</td>
</tr>
<tr>
<td>Bulbs</td>
</tr>
<tr>
<td>Man labor</td>
</tr>
<tr>
<td>Horse labor</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

*Labor income is found by subtracting all operating costs, including unpaid family labor, except the operator, and interest on the investment from total receipts.
TABLE VII—COSTS OF PRODUCING SETS PER ACRE

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Cost of Growing Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of land</td>
<td>$892.00 at 6 percent</td>
<td>$53.52</td>
</tr>
<tr>
<td>Use of equipment</td>
<td>$54.00 at 7 percent</td>
<td>3.78</td>
</tr>
<tr>
<td>Fertilizer</td>
<td>12 tons at $1.00 (every other year)</td>
<td>6.00</td>
</tr>
<tr>
<td>Man labor</td>
<td>205 hours at 35 cents</td>
<td>71.75</td>
</tr>
<tr>
<td>Horse labor</td>
<td>53 hours at 15 cents</td>
<td>7.95</td>
</tr>
<tr>
<td>Seed</td>
<td>60 pounds at $2.00</td>
<td>120.00</td>
</tr>
<tr>
<td>Sacks</td>
<td>122 at 8 cents</td>
<td>9.76</td>
</tr>
<tr>
<td>Total</td>
<td>$272.76</td>
<td></td>
</tr>
</tbody>
</table>

ably more than that of planting seed for market onions since they are placed in the ground by hand one at a time, but the weeding is less. This results in a somewhat lower labor requirement for the production of an acre of seed than for market onions. Growing seed requires careful storing of the bulbs thru the winter and uses labor in threshing out seed in the fall when other work is not pressing.

Table VI shows the items of cost with approximate values in the production of seed.

Under normal conditions one bushel of bulbs will produce from three to four pounds of seed, or from 400 to 500 pounds per acre. At these figures seed costs from about 75 cents to $1.00 a pound.

COST OF GROWING SETS

Only about 12 percent of the acreage producing market onions was grown from sets in 1921. With the advent of the set-planter and the advantages of earlier markets and larger yields, more onions will probably be grown from sets. Ground less completely subdued can be used for sets with fair results, whereas, thoroly subdued ground must be used for profitable growing from seed. The seed cost where sets are used is, of course, much higher than where seed is used, since approximately 25 bushels of sets are required to plant one acre, at a cost of from $2.50 to $3.00 per bushel. Compared with four pounds of seed at $1.50 a pound this seems very high. Most of the farmers grow their own sets from small patches consisting of from a few rows in

Fig. 16. Seasonal distribution of labor per acre in onion production.
the garden to as much as half an acre. Figures covering cost of production are, therefore, but careful estimates based on practical experience. Table VII enumerates the items of cost with values assigned on producing sets.

**ONION SETS**

The production of onion sets differ from the production of the general crop mainly in the quantity of seed used per acre. The principle underlying the production of onion sets is that of arresting development. This is secured by over-crowding. The seed, therefore, is planted very thickly, as much as a maximum of 75 pounds per acre being used. On the average, one pound of seed will produce about four bushels of sets.

**VARIOUS OPERATIONS IN ONION GROWING**

There are several distinct and necessary operations in onion growing. Table VIII lists the operations and shows the time required for each as shown by data used in this bulletin.

**SEASONAL DISTRIBUTION OF LABOR**

Reference to the graph on page 284 will show that onion production alone does not fully occupy the farmer’s time throughout the year. Perhaps this is no more true of the onion crop than of many other Iowa crops. The month of August which covers the important field operations incident to harvesting, includes more than 46 percent of the entire labor required for the crop. Practically the entire labor requirement is covered in the nine open months, thus leaving the farmer unoccupied during the winter months.

Even tho onion growing uses the farmer’s time so unevenly, it is sufficiently profitable to provide a standard of living perhaps equal to that of the corn belt farmer. It is a well-known economic principle that any business which is sufficiently
profitable to provide a living with only part-time employment, if open to free competition, soon attracts enough capital and laborers to over-supply the demand in that line. There are hundreds of acres of Iowa soil that are suitable for onion production, located as well with reference to transportation facilities and markets, as is the Pleasant Valley area.

Why, then, do not more men living in these areas engage in the onion growing business? The answer lies in the fact that onion growing is a highly specialized business requiring a special type of person to be a successful grower. The Pleasant Valley district was settled originally by a German born population. Old settlers there say the farms are now owned largely by descendants of the original German stock that began onion growing three generations back. The personal equation is perhaps as important an element in onion growing as in any line of agricultural production. Unless a farmer possesses the personal inclination for this intensive type of farming and the necessary technical skill, it would be unwise for him to attempt to add this enterprise on any large scale to his other farm business. If one expects to engage in onion growing on a commercial basis it would be well to work as a hired man in the onion region until he became thoroughly acquainted with the methods and details of production and marketing. When one knows the peculiarities of the crop and develops a liking for that particular kind of work, there is no reason why he should not be equally successful in this line of agricultural production. However, it should be remembered that if one produces any crop alone in a community he will find it almost impossible to solve successfully the many problems of production and marketing singlehanded. Therefore, a community of interest is a distinct advantage. The demand for onions is also comparatively limited and any considerable increase in production would unquestionably result in greatly reduced prices. Onions are not likely to become a crop on the average corn belt farm because the nature of the work and the care needed for onion production contrasts widely from that of corn, hogs and cattle.

*U. S. Dept. of Agriculture.
*Cheaper land is used for producing seed than market onions.