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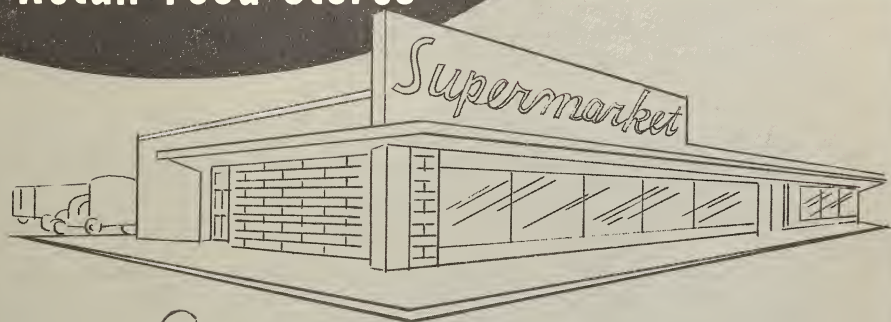
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Improved Methods of Trimming Produce in Retail Food Stores

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
MARKETING RESEARCH DIVISION
WASHINGTON, D. C.

Washington, D. C.



U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
Marketing Research Division
Marketing Research Report No.192

PREFACE

This study of more efficient ways of trimming fresh produce in retail stores is part of a broad program of research aimed at reducing the costs of marketing farm products, including the heavy costs of handling and of deterioration and spoilage.

In 1956, the estimated total labor cost for marketing farm foods was 18.3 billion dollars. Losses due to deterioration and spoilage of vegetables alone in marketing channels have been estimated at well over 200 million dollars a year. When adopted, the trimming procedures and methods described in this report will materially help to reduce the cost of labor and spoilage and maintain the salability of these foods at the retail store level.

Handling costs and spoilage losses are high for many food products, and improvements in handling practices offer possibilities for substantial savings. Research is going forward along many lines to achieve these savings. To the extent that such costs can be held down, their burden on both consumers and producers is reduced, and the often wide spread between what the farmer gets for a commodity and what the consumer pays for it at retail can be minimized.

Marketing costs and losses normally are reflected back to the farmer in lower prices, or to the consumer in higher prices, or both, as competition among traders gradually adjusts cost and margin levels. Their reduction, therefore, can benefit all the factors in the food and fiber industries--producers, processors, distributors, and consumers.

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ACKNOWLEDGMENTS

The study on which this report is based is part of a larger research project to improve operations of retail produce departments. The work is under the general supervision of R. W. Hoecker, head, Wholesaling and Retailing Section, Transportation and Facilities Branch, Marketing Research Division, Agricultural Marketing Service.

Acknowledgment is made to Food Fair Stores, Inc., and Penn Fruit Co. of Philadelphia, Pa. for their assistance in conducting the tests reported in this publication.

August 1957

For sale by the Superintendent of Documents, U. S. Government Printing Office,
Washington 25, D. C. Price 35 cents.

SUMMARY

Improved produce trimming methods, equipment, and workplaces developed and installed in 2 supermarkets with weekly produce sales of \$3,500 and \$5,000 saved, respectively, 8-1/2 and 16-1/2 man-hours a week. These savings represented an increase in production of 48.4 and 61.5 percent, respectively. The time saved was used by these trimmers to perform other tasks in the produce department. In both stores, an improvement in the quality and yield of the trimmed produce was noted.

The objective of the study was to develop and evaluate improved hand methods of trimming produce, using minimum time and maintaining quality of the product, and to develop improved equipment and workplace arrangement for the trimming operation. Detailed studies were made in the retail stores of 3 large food chains with outlets in the eastern and southeastern United States. Additional studies were made of produce trimmers in other sections of the United States.

Improved methods were taught to trimmers in the stores of the 3 chains, and records were kept on production and product yield. The following general rules for good trimming were developed for all trimmed produce:

1. Set up a proper workplace.
2. Work from the original box.
3. Use two hands to pick up all large or leafy items.
4. Use a sharp knife.
5. Keep the knife under control.
6. Use leverage for cuts.
7. Trim leaves or stalks first--butt last.
8. Combine the last trimming motion with disposal of the product.
9. Combine packaging or tying with trimming or display.

Specifically do NOT:

1. Flip or regasp product.
2. Put the thumb in front of the knife blade.
3. Hack, whittle, or cut toward the body.
4. Rehandle the product.

Training the trimmers in the recommended method of trimming iceberg lettuce reduced trimming time from an average of 4.80 minutes to 2.64 minutes, an average saving of 2.16 minutes per 2-dozen carton in 2 stores, and resulted in an increased yield of about 12 percent. Adopting the improved celery trimming method reduced the average time to trim a crate of celery from 5.34 to 3.75 minutes, a saving of 1.59 minutes per crate. The improved method of trimming corn reduced the average time in 2 stores to trim a 60-ear crate of corn from 6.24 minutes to 4.80 minutes, a saving of 1.44 minutes per crate. Similar results were obtained for the other trimmed products.

Some of the major factors affecting the trimming time were the quality of the produce, the method of price marking, the quantity and method of handling retrim, and the method of storing the product.

Handling of garbage, trash, and salvage was an important part of the trimmer's job which affected not only the trimming time but other produce jobs as well. Installation of 2 types of garbage disposal units saved 42 and 68 percent in garbage handling and pickup costs in 2 stores. Improved techniques of handling garbage, trash, and salvage were developed which were an important factor in making a better work station.

Improved work stations for produce trimmers reduced handling time, made the job easier, and conserved space for the trimming operation. A holding device for the containers of produce to be trimmed, consisting of either a V-shaped conveyor or a pipe frame, was developed. Other improved equipment included a small sink, wire mesh washbaskets, tool and material holders, and improved containers and dollies.

These improved workplaces were tested for several different types of operations and the following principles of good arrangement were developed:

1. Provide means of getting and positioning several crates of merchandise to trim at one time.
2. Position crates of merchandise close to and in front of the operator, so merchandise can be easily removed without damage. Best results were obtained with the crate tilted 45° toward the operator.
3. Provide a disposal point for trimmings so that trimmings do not spill on the floor.
4. Provide a disposal point for trimmed produce close to the operator, preferably on the left side, and adequate for more than one tub for sorting the trimmed produce.
5. Have the disposal point high enough so that trimmed produce is placed, not dropped.
6. Provide an adequate storage place for tools and materials used, close to the operator, and with tools and materials pre-positioned for use.
7. Provide a small sink with drainboard for washing, located near, but not in the main work area.
8. Provide an adequate number of tubs that nest and stack.
9. Provide some wire baskets for washing and draining.
10. Locate tubs, baskets, handtrucks, and storage areas close to the work station.
11. Locate the trimming area near the cooler, with the cooler door opening toward the trimming station.
12. Provide a storage area close to the trimmer for disposal of empty crates and boxes.
13. Store the supplies in a dry area near the trimmer.
14. Provide a sharpening stone.
15. Provide a convenient quick-action control for disposal machines, if used.

IMPROVED METHODS OF TRIMMING PRODUCE IN RETAIL FOOD STORES

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INTRODUCTION

The produce department is the third largest in most food markets, ranking in volume of sales below the grocery and meat departments. Typically, produce accounts for 8 to 12 percent of the store's sales volume and, primarily because of the perishability of produce, the margin in handling it is one of the highest in the store. The trimming operation consists of preparing certain vegetables for display by removing damaged outer surfaces, removing part of the butt to enhance the appearance, and, in some instances, removing outer leaves or covering so the product can be seen better. In 4 produce departments studied, trimming represented 15 to 17 percent of the produce-department labor.

The purpose of this study was to evaluate observed produce trimming procedures and to develop and test improved equipment, trimming methods, work-place arrangement, and work organization. Detailed studies were made in retail stores in 3 large food chains with outlets in the eastern and southeastern United States. Additional studies were made of produce trimmers in numerous food outlets in other parts of the United States. Improved methods were taught to trimmers in the stores of the 3 chains, and detailed records were kept of production and of yields of the products. Comparisons were then made with conventional operations, by means of time-study procedures. ^{1/}

An analysis of the trimming operation in 4 stores indicates that about three-fifths of the man-hours devoted to trimming involved working directly on the product. The rest of the time was required to perform work incidental to the trimming (table 1). Time consumed in handling empty containers, salvage, trash, and garbage, and for cleanup varied from store to store, depending on the equipment and how the trimmer worked. Some trimmers tended to let the trash and garbage collect, and cleaned it up at the end of the day or left the job for other personnel.

In the stores studied, some factors contributed to poor labor productivity. Workplaces were often poorly designed or completely lacking, and trimming methods sometimes were slow, dangerous to the worker, and damaging to the product.

^{1/} Detailed time standards for all trimming operations in 2 stores are available on request.

Table 1.--Percent of total time, by functions, required to trim produce in 4 supermarkets

Function	Store A	Store B	Store C	Store D
	Percent	Percent	Percent	Percent
Trim and retrim <u>1/</u>	65.8	58.1	57.1	51.7
Wash.....	2.4	4.2	2.8	1.9
Obtain, set up, and dispose of product <u>2/</u> ...	14.8	7.6	15.5	12.8
Open container.....	4.5	2.4	1.9	2.3
Handle salvage and tubs..	1.5 <u>3/</u>	7.2	11.5	12.3
Handle garbage.....	3.9	3.9	4.0	3.2
Cleanup.....	5.6	14.8	5.6	9.7
Miscellaneous.....	1.5	.18	1.6	6.1
Total.....	100.0	100.0	100.0	100.0

1/ Includes some pricing.

2/ Obtain product from storage, set up full containers for trimming, and dispose of trimmed product to container.

3/ Handling tubs is included in obtaining, setting up, and disposal function. Salvage handled by other employees.

Old crates, tubs, garbage cans, and other stray material were used to hold crates of merchandise at working height, and much of the trimmings ended up on the floor. Knives were not kept sharp and tools were poorly located. Some sinks were too big and used needed space. Disposal units, when provided, frequently did not fit properly into the trimming workplaces. The result, in addition to loss of productivity, frequently was considerable loss of quality and of gross returns to the produce departments.

TRIMMING METHODS

Much of the conventional trimming instruction was concerned with the appearance of the product after trimming, and not with the technique of trimming. As a result, many trimmers developed different methods, even though the end product was often the same.

The most common errors were too much handling of the product, removing too much of the outer surfaces, using awkward and dangerous motions, misuse of tools or equipment, and lack of tools, equipment, or workplaces.

While many different trimming methods were encountered and some trimmers changed methods from piece to piece, the best trimmers tended to develop similar methods.

The best methods observed were analyzed and new methods developed. Operators were trained and tested in the use of these methods to provide a basis for recommendations for each commodity.

The following general rules for good trimming are based on research with the individual commodities:

1. Set up a proper workplace.
2. Work from the original box.
3. Use two hands to pick up all large or leafy items.
4. Use a sharp knife.
5. Keep the knife under control.
6. Use leverage for cuts.
7. Trim leaves or stalks first--butts last.
8. Combine the last trimming motion with disposal of the product.
9. Combine packaging or tying with trimming or display.

Specifically, do NOT:

1. Flip or regrasp the product.
2. Put the thumb in front of the knife blade.
3. Hack, whittle, or cut toward the body.
4. Rehandle the product.

Iceberg Lettuce

This commodity was received in wirebound crates packed 3, 4, and 5 dozen heads to the crate, or in fiberboard containers packed, most frequently 2 dozen to the box. The fiberboard containers were usually opened by the trimmer without any special tool. Opening of the wirebound crate usually required a knife or a hammer to unhook the holding wires. The merchandise was typically trimmed directly out of either type of container at the workplace. The trimmer obtained a head of lettuce and cut through the butt with a knife, at the same time removing some of the outer leaves. The discolored, damaged, or decayed leaves were then removed to reduce the head to a compact, clean unit. Occasionally, the butt was cut again to make it flush with the head. The resulting product was a compact head that could be stacked closely in the display area.

In some stores, each head of lettuce was encircled with a paper-covered wire tie 2/ by the trimmer, as a separate operation. In most stores, ties were price-marked in advance of application.

Time to trim and place in a tub, in 4 stores, ranged from .186 to .215 minute per head. The total time to trim and tie lettuce in 2 separate steps in 4 stores ranged from .240 to .407 minute. In the stores studied, no bagging was performed by the trimmers.

Removing the butt first was a mistake made by most trimmers. When this was done, the knife was drawn through the butt and some of the leaves were removed in the first cut. Often this cut was too deep, causing good leaves to fall off or separating the base of the leaf from the stalk, causing it to

2/ "Ties" as referred to in this report are a fine wire embedded between 2 strips of paper about one-half inch wide. The ties are wrapped around the product and fastened by twisting.

wilt and come loose on the counter. Sometimes this cut was not deep enough and had to be repeated after damaged leaves were removed. A few trimmers drew the knife across all the heads of lettuce in an open pasteboard box, in 3 cutting motions. This caused considerable damage to the lettuce.

In 3 stores in the Southeast, tests were made comparing the yield of lettuce when trimmed butt first and when trimmed leaves first. It was found, on the average, 12 percent more lettuce was merchandised in the higher of 2 price categories when the leaves were trimmed first. When the spread between the two prices was 6 cents, this represented 17-1/2 cents more per carton of 24 heads. This improvement would, of course, be passed on to the customer in more lettuce on the larger heads, which were already in the higher price category.

The measured net gain in the 3 medium-sized supermarkets for trimming leaves first was \$8.40, \$10.65, and \$11.85 for a week. The additional labor cost of trimming the butt last was subtracted from the gain in value of the lettuce to obtain these net gains.

Similar tests were made in another region of the United States, and the lettuce trimmings were weighed. Results are shown in table 2. In the conventional method of trimming butt first and applying ties in the back room, 12.2 pounds were trimmed away for each carton of dry-pack lettuce. When trimming butt last and applying the tie in one operation, 8.8 pounds were lost in trimming and displaying for each carton. This represents a net gain in each carton of 24 heads of 3.4 pounds of lettuce, or an average of about 2 ounces per head. It represents a weight gain of 11.5 percent for this test of the improved trimming methods.

Table 2.--Amount of waste per 24-head carton of dry-pack lettuce resulting from 2 methods of trimming

Type of waste	Butt first and	Butt last and applying
	applying tie in back room	tie in one operation
	Pounds	Pounds
Trimmed.....	10.0	8.7
Lost applying ties.....	2.0	0
Left in tub at display.....	0.2	0.1
Total.....	12.2	8.8

A second common mistake was to take off too many of the outer leaves, causing the heads to be reduced unnecessarily in value.

Throwing, tossing, or dropping the heads into tubs or containers was another common fault. Trimmers also often pulled off outer leaves unnecessarily when removing the head from the original crate because they did not start with the center "key" heads. Trimming and banding, when performed as 2 separate operations, also caused unnecessary handling and an extra loss in outer leaves.

The recommended method of trimming lettuce is to obtain the head with the left hand, assisted by the right to prevent pulling off leaves unnecessarily, and to remove damaged, discolored, or decayed outer leaves only as necessary.^{3/} The leaves are removed by holding the head of lettuce in one hand and removing the leaves with the other, shifting the head to the other hand to get at the leaves on the other side (fig. 1). Outer, firmer leaves are preferably left on unless badly damaged. The head is then held in the left hand while the right obtains a knife. Most of the experienced trimmers are able to hold the knife during the entire operation. Occasionally, decayed spots must be cut out with the knife, and this should be done before the butt is cut. A thin slice is then taken from the butt, parallel to the head and slightly below the base of the last leaf. In making this cut, the thumb is braced for support against the lettuce head on the side away from the blade, and the knife is drawn through the butt by twisting the wrist. The head is then placed in a tub with the left hand, while the right hand disposes of the knife. When tying is to be done by the trimmer, the left hand should hold the head while the right hand disposes of the knife, after trimming, and obtains a tie and applies it to the head. The left hand then disposes of the head while the right obtains another. If washing is desired, the heads are placed in a wire basket as trimmed and dipped in the sink or sprayed. Ties applied before washing prevent loss of leaves in washing.

Trimming productivity increased when trimmers were taught the new method. The average trim time in 2 stores where ties were not used was reduced from 4.80 to 2.64 minutes per 24-head carton, a saving of 2.16 minutes. In another store where ties were applied, total trim and tie time was reduced from 5.76 to 4.63 minutes per carton for a saving of 1.13 minutes per carton.

Celery

Shipments of pascal celery were received in wirebound or nailed wooden crates packed usually 2 or 2-1/2 dozen per crate. White celery and celery hearts came in larger quantities per crate. Some bunches of celery hearts were held together with rubber bands. Conventional trimming methods consisted of the removal of discolored or damaged outer stalks, usually by pulling them off, freshening of tops by cutting or chopping off the discolored ends of the leaves, usually with several chopping motions, and slicing the butt with either a single cut or 3 to 5 diagonal cuts to form a tapered point. Some firms permit cutting off bad stalks inside the bunch by inserting the knife point in cutting out the top part of the bad stalks. This leaves the remaining portion of the stalk in the bunch and saves pulling off good outer stalks. The trimmers were about equally divided between those making the cuts toward the body and those making the cuts away from the body. Time requirements varied with celery size and condition. Sometimes the trimmed item was placed in the sink, celery being one of the produce items which is occasionally dipped in water to cleanse and freshen it. In the test stores, after rinsing, celery stalks were placed on the sink drainboard to drain and later transferred to tubs or wooden crates.

^{3/} All recommended methods are for right-handed trimmers. Left-handed trimmers have reversed these procedures with no difficulty.



NEG. BN-3991

#1. Pull head from box
with 2 hands.



NEG. BN-3992

#2. Hold head in left
hand and pull bad leaves
with right.



NEG. BN-3993

#3. Shift head to right
hand to pull leaves from
the other side.



NEG. BN-3994

#4. Hold head in left hand,
pick up knife with right.



NEG. BN-3995

#5. Cut butt, with thumb
braced on head.



NEG. BN-3996

#6. Dispose of head with
left hand, knife with right.

Figure 1.--Recommended method of trimming iceberg lettuce.

Only one trimmer was found who trimmed celery--both butt and tip--on a cutting board. Tests of the two methods showed productivity to be higher when the celery was held in the hand. Trimming time per bunch was .167 minute holding the stalk and .198 minute on the trimming board. Butt cuts on the board were difficult, but taking off the tips of the stalks on the board proved fairly successful.

White celery was trimmed in the same manner as the larger pascal celery. Celery hearts also were trimmed in the same manner, although occasionally, when hearts were received with 2 or 3 bunches tied together, they were trimmed in one operation without separating. Stalks removed were pulled out through the top of the bunch. Celery was frequently banded by the trimmer, with either paper ties or rubber bands.

Trimming time for 2 and 2-1/2 dozen bunches of celery varied from .144 to .236 minute per bunch in 7 stores. Application of rubber bands as a separate operation by the trimmer required .078 minute. Application of paper ties as a separate operation required .129 minute. In several stores, paper ties were applied by the display man, relieving the trimmer of this duty.

The recommended method of trimming pascal celery is to obtain the bunch with the left hand, butt toward the heel of the hand (fig. 2). Bad stalks are pulled off with the right hand while the bunch is rolled in the left hand. The bunch is then held in the left hand with the palm up, with the butt toward the right hand. The thumb of the right hand is braced on the celery to the side of the blade and well up on the stalk. The knife is rotated by pulling the handle toward the trimmer and rotating the celery in the other direction, making a tapered, circular cut about half way around the butt. Position of the thumb is changed and the cut is continued until complete. By this method, with 2 or 3 moves of the thumb a tapered butt can be obtained in one cut with the knife under control at all times. The left hand then is turned over, palm down, and a square cut is made as near the top of the stalks as possible, with the top of the bunch against a sloped trimming board; this is done to freshen the ends. Some trimmers not equipped with the board used a square chopping cut to top the bunch, with the top pointed down toward the trimmings disposal point. This method of topping was only slightly faster and required more skill. Topping in this fashion is not recommended, but, if it is done, a sharp knife should be used, as a dull knife breaks the bottom stalks. The left hand should be kept below midway on the bunch, for safety. When the top of the bunch is pointed down, the ends chopped off are kept in the trimmings container and not scattered.

The recommended method of trimming the tops is sometimes abused by trimmers when they cut off an excessive amount. To control this, an alternative method has been recommended that requires removal of any dried or discolored tips or leaves from the leafy end of each stalk by cutting or picking off with the knife blade and thumb. This method requires considerably more time than the straight cut, but preserves the size and quality of the stalk better.

Any bad leaves not removed can then be picked off or cut out. A whipping, sideways motion with the knife will remove any discolored leaves low on the sides of the bunch.



NEG. BN-3997



NEG. BN-3998



NEG. BN-3999

#1. Obtain bunch from box with 2 hands.

#2. Hold bunch and pull bad stalks.

#3. Position celery and knife to cut butt.



NEG. BN-4000



NEG. BN-4001



NEG. BN-4002

#4. Cut butt, holding thumb against bunch.

#5. Second cut of butt.

#6. Straight chop cut of top.



NEG. BN-4003



NEG. BN-4004

#7. Cut off bad leaves and stem ends.

#8. Dispose of bunch in container.

Figure 2.--Recommended trimming method for celery.

The celery is then placed in a tub or, if a band is to be applied, the right hand disposes of the knife, obtains a band, and applies it before putting down the bunch. Celery to be washed can be placed in wire baskets as trimmed and later dipped into a sink or sprayed.

With smaller bunches, such as white celery or celery hearts, similar procedures are followed, except that when several bunches of celery hearts are tied together they are trimmed at one time, as previously mentioned.

This improved method of trimming gave a better appearing bunch of celery and reduced the average time in 2 stores to trim a crate of 2-1/2 dozen bunches of celery from 5.34 to 3.75 minutes, a saving of 1.59 minutes per crate. In another store, where rubber bands were applied to celery by the trimmer, the combination of the 2 steps into 1 reduced the time to trim and band from 7.05 to 5.19 minutes per crate, a saving over conventional methods of 1.86 minutes per crate.

Trimming time for white celery was reduced by improved methods from .266 to .229 minute per bunch, and trimming time for celery hearts from .376 to .193 minute per bunch.

Sweet Corn

Sweet corn was usually shipped in wirebound crates or, occasionally, in burlap sacks. Five dozen was the most frequent quantity packed per crate. There was greater variation in the ways corn was trimmed than in trimming any other item. Figure 3 shows corn trimmed by various methods.



NEG. BN-4005

Figure 3.--Various types of trim for corn, (left to right) full face, partial face, window, and fully shucked.

One of the most common methods was "facing," which involved holding the ear in one hand and chopping off the butt with the knife. The ear was then flipped or passed to the right hand and back to the left, to reverse the ends, and a knife cut was made almost through the tip. The husk still attached to the tip was then grasped between knife and thumb and a strip pulled from the side of the ear. Small bits of husk and silk were then picked off by hand. Occasionally, additional cuts at the tip were required to remove wormy areas or parts of the cob without full kernels. The time

to trim by the "facing" method, in 5 stores, ranged from .093 to .106 minute per ear. A similar method was followed where corn was completely husked for packaging, except the butt was cut closer and the rest of the husk was pulled off by hand.

A few trimmers hacked both ends and then pulled off the husk by hand. Another variation was to make the butt cut by cutting toward the operator, using the thumb as a brace on the end of the butt. Hacking both ends and pulling the face took .122 minute per ear compared to .098 minute for the cutting method.

A version of the full-face method, involving a trimming board, was tried. The ear was held against a trimming board with the left hand (butt toward the right) and the butt was cut through with the knife. Then the ear was turned and a knife cut made almost through the ear near the tip with the knife. The knife was then turned slightly sideways and the ear pulled up and away to remove the husk from the face. For a limited number of tests, the cutting board method required .155 minute per ear, as compared to the conventional method, holding the ear in the hand, of .119 minute.

The partial face method was another version, involving hacking off the butt and making a knife cut crosswise in the husk about two-thirds of the way from the butt. A portion of the husk was removed by lifting it with the knife slightly, then grasping it between knife and thumb, and pulling it off all the way to the butt, revealing a partial face. Since the tip was not removed, good quality corn was necessary, but this method required the least time of any studied. Time to trim corn by the partial face method was .068 minute per ear.

Several forms of windowing also were studied. One method involved hacking off both butt and tip and then making 2 knife cuts crosswise in the husk, about 2 inches apart, about a third of the way from the butt. As the second cut was made, the husk between was lifted out, exposing a section of the kernels.

Several devices were used to window corn. One involved a double-bladed knife to make the window cuts. Another employed a blade with a V-shaped notch and a sharpened pipe end, against which the ear was swung to chop a window. Both bruised the kernels in cutting the window, and the husk frequently did not come out of the window and had to be picked out by hand. All methods of windowing corn resulted in cut kernels, and it is therefore important to make the window cuts with the knife at right angles to the ear in order to reduce the number of torn kernels. Time for the window method with a conventional trimming knife was .108 minute per ear.

Both the window and partial face methods left cut kernels in the ear, and required skill on the part of the trimmer to keep from tearing out several kernels when lifting the face. Careless trimmers using the full-face method often cut off part of the tip of the ear that was good, thus shortening the ear unnecessarily.

The recommended method for trimming the ear full-face or completely stripped for packaging involves controlled cutting, without hacking. The ear is grasped with the left hand, butt toward the heel of the hand, and the hand palm up in front of the operator (fig. 4). It is important to position the natural "V" formed by the outer husks in an upward position, for a narrow face, and the "V" down for a wide face. The right hand, with the knife blade pointed up, cutting edge toward the operator, is brought to the butt. The thumb of



NEG. BN-4006



NEG. BN-4007



NEG. BN-4008

#1. Obtain ear from box with left hand.

#2. Hold ear to cut butt.

#3. Cut butt and pull shucks.



NEG. BN-4009



NEG. BN-4010



NEG. BN-4011

#4. Turn hand to reposition ear.

#5. Hold ear to cut tip.

#6. Cut tip.



NEG. BN-4012



NEG. BN-4013

#7. Pull face.

#8. Dispose of ear.

Figure 4.--Recommended method of trimming corn by the full-face method.

the right hand is placed on the tip of the butt opposite the knife blade. The operator then turns the knife, bringing the handle up, at the same time turning the ear in the opposite direction, cutting off and disposing of the butt and the first leaf of the husk. The left hand then turns the ear over, bringing the tip to the knife, with the forefinger of the left hand exploring the ear, through the husk, to find the last full kernel, so as to gage the cut. The knife is then positioned as before, and the tip nearly cut off. The right hand pulls the husk from the face by grasping the husk between knife blade and thumb. The ear is then disposed of with the left hand, while the right drops the husk. In stripping the ear completely, the butt is cut closer and the ear is held in the left hand, while the right pulls away the rest of the husk.

In 2 stores, average trim time per crate of 60 ears by the full-face method was reduced from 6.24 minutes by the conventional method to 4.80 minutes, a saving of 1.44 minutes per crate.

Cabbage

Cabbage was received in either wirebound crates or burlap sacks. When it was received in burlap sacks, the trimmer often dumped the contents on a work table or sink drain. When the cabbage was received in wirebound crates, trimmers worked out of the crate.

Green and red cabbage were handled and trimmed in approximately the same manner. Most frequently, the butt was trimmed by cutting off a slice with a movement of the knife toward the body of the trimmer, while the head was held at the operator's hip level. Damaged leaves were then picked off and sometimes damaged areas were cut out with the knife.

From winter cabbage, outer leaves were removed until only fresh leaves tightly attached to the head remained. Because of the compact nature of the head, bad spots could be cut out with the knife. Summer or new cabbage was frequently trimmed in the same manner, but when all of the outer green leaves were removed until a compact head remained, the heads were often left extremely small, with a loss in attractiveness and weight. In addition to over-trimming summer cabbage, other common trimming faults were: Trimming the butt too close to the head, loosening the base of outer leaves; bruising by throwing or tossing; cutting the butt first; cutting with the knife out of control; cutting the head with the knife when slitting the sack to open it; and picking up the head by spearing it with the knife point.

Trimming times in 7 stores varied from .107 to .226 minute per head. The time to trim a head of cabbage varied considerably with the quality and leafiness of the head. The time per head required by one trimmer to trim cabbage of different types or conditions illustrates the amount of variance. Leafy summer cabbage of good quality took .214 minute per head. Winter cabbage of poor quality .268, fair quality .170, and good quality .098 minute. All of this cabbage was trimmed by recommended methods, with equal attention to quality. Unattractive outer leaves were removed from summer cabbage, but some of the outer leaves were left to "frame" the head.

The recommended method of trimming cabbage is to grasp the product in the left hand and remove damaged outer leaves with the fingers, transferring the head from hand to hand to remove leaves from either side (fig. 5). The knife (which is either held or laid down between heads, depending on the finger dexterity of the trimmer) is then picked up and any damaged or slimy areas cut out. While the head is held with the left hand, with butt up, the butt is shaved off, the right hand twisting the knife blade through the butt parallel to but slightly above the head, with rotation of both the head and wrist to pull the knife through. Pressure against the head by the thumb of the right hand, supported on the head of cabbage to the side of the knife blade keeps the knife under control, makes the operation safer, and helps the trimmer to gage the cut more accurately. On cabbage with large, tough butts, the same procedure as for cauliflower can be followed. The left hand then disposes of the head gently and returns for another head, while the right hand disposes of the knife and moves to help pick up the new head. If washing is desired, the cabbage can be placed in a wire basket as trimmed and then dipped into a sink of water or sprayed.

Trimming time per head was reduced from .107 to .098 minute when improved methods were taught for the same quality and size of good winter cabbage and from .191 to .121 minute for summer cabbage.

Cauliflower

This commodity was most frequently shipped in wirebound crates. Trimming consisted of cutting off the ends of outer leaves to a point slightly below the level of the top of the flower; checking of florets for damaged, discolored, or wormy surfaces; removing them; and slicing off the butt to freshen appearance or provide a clean price-marking surface. The head was held against the trimmer's hip or stomach, and several slightly diagonal cuts were made, through the leaves and in toward the florets, to remove the green leaves to a level with the flower or florets (fig. 6). The head was turned slightly after each cut until the head was fully rotated. Sometimes small inner leaves were close to the florets and had to be picked off by hand. The head was then turned upside down and part of the butt was removed. Careless trimmers sometimes nicked the florets in cutting off the leaf ribs. Occasionally on large cauliflower, a trimmer held the head against a table or other fixture and cut the butt against the support. This was necessary because of the heavy pressure needed to cut through the base of the head. Occasionally, retrim cauliflower was cut up into chunks or florets by the trimmer for packaging. Trimming time per head in 7 stores ranged from .206 to .459 minute. Size and condition of the cauliflower are important factors affecting the trim time.

Tests were made of trimming cauliflower against a board or table. The method used in trimming on the board was to hold the head on the board in the left hand, insert the knife against the florets and cut down to the board, removing the leaves without cutting the florets. A cutting board was developed which sloped to the garbage disposal point so trimmings would not have to be scraped off the board by hand (fig. 7). Trimming time with this board was .270 minute per head and was more productive than trimming on a flat table, but not as productive as holding the head against the body and cutting in toward the head.



NEG. BN-4014

#1. Pick up head from box.



NEG. BN-4015

#2. Hold with right hand and remove leaves with left hand.



NEG. BN-4016

#3. Shift head to left hand to remove leaves with right.



NEG. BN-4017

#4. Pick up knife.



NEG. BN-4018

#5. Remove damaged areas.



NEG. BN-4019

#6. Hold head and position knife to cut butt.



NEG. BN-4020

#7. Completion of stroke to cut butt.



NEG. BN-4021

#8. Dispose of head and knife.

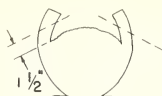
Figure 5.--Steps in recommended trimming method for cabbage.



MOST FREQUENT
METHOD USED



METHOD ALLOWING
MAXIMUM VIEW
OF HEAD



RECOMMENDED METHOD
FURNISHING MOST
PROTECTION AND
CAUSING LEAST
DAMAGE TO THE HEAD

Figure 6.--Diagram of three types of cuts used in trimming cauliflower.



NEG. BN-4022

Figure 7.--Trimming board developed to dispose of trimmings automatically.

but cutting away from the body. Trimming by this method reduces the hazard involved in cutting toward the body, but conceals the flower and makes it more difficult to determine the correct position for the cut.

Inner leaves are picked off by hand. When the leaves have been removed, bad spots are picked out of the flower with the knife point, and the head is turned and placed against a sloped cutting board or the edge of the crate. The knife is then forced through the butt toward the board. This method required .191 minute per head, compared to .204 minute for the best of the conventional methods studied.

Occasionally, on poor-quality cauliflower or on cauliflower that has been returned for retrim, dirty florets are encountered. It was found that a stiff bristle brush or potato peeling knife was advantageous in cleaning these



NEG. BN-4023

#1. Hold head in left hand to make cut with right hand at an angle.



NEG. BN-4024

#2. Continue cutting around head by rotating it.



NEG. BN-4026

#3. Pick leaves.



NEG. BN-4027

#4. Cleaning florets with knife.



NEG. BN-4028

#5. Turn head, pass to left right and back to left hand.



NEG. BN-4029

#6. Cut butt off against edge of container or slope board.



NEG. BN-4030

#7. Dispose of trimmed head and reach for new head.

Figure 8.--Steps in the recommended method of trimming cauliflower.

discolored areas without damaging the appearance of the head, provided the head was dry and not rotten or slimy.

Bunch Carrots

Although most carrots are sold packaged, some carrots are still received in bulk. These were usually packed 72 or 48 bunches to the crate, grouped into 12 master bunches of 6 individual bunches or 8 master bunches of 6. All un-packaged carrots were received with tops attached. These tops were cut off about 6 or 7 inches above the carrots during the trimming operation. Individual bunches, as well as master bunches, were held together by paper ties.

Conventionally, trimmers picked out a master bunch and cut off a part of the carrot tops, then cut the tie holding the individual bunches together. The bunches were then picked up individually and the carrots were fastened more firmly by slipping a rubber band over the carrots themselves. When applying the rubber bands, it was often difficult to get the carrots held tightly enough to stretch the rubber band over all of them. Some operators obtained several bands at a time and stretched them over their fingers. It was found the time to put the bands on the hands was more than was saved in applying them. In addition, the bands caused discomfort. Occasionally, broken carrots were removed or an additional carrot added to a bunch. Ties required occasional tightening or replacing. Each master bunch was worked in turn and, at the end, loose carrots in the bottom of the crate were gathered and bound together to make an additional bunch or so. Some trimmers picked up and topped more than one master bunch at once. In some stores, the rubber bands were left off.

While bunch carrots are not often handled in many supermarkets, they do require considerable time when banded. In 6 stores where carrots were banded, the time to top and band a crate of 72 bunches of carrots was from 10-1/2 to 14-1/2 minutes. The time to top, but not band, a crate of 72 bunches was approximately 2 minutes.

The recommended method of topping carrots is to place the crate next to a garbage can or disposal unit. At least half the bunches are pulled up against the side of the crate and the tops cut off by bending them over the edge of the crate and cutting just outside the crate. As each master bunch is pulled up and topped, the tie holding the master bunch together is cut. The rubber band is then applied to each individual bunch (fig. 9).

In applying the rubber band, it was found advantageous to use a 1/4-inch smooth steel rod mounted firmly at the edge of the workplace. Each rubber band was obtained individually, hooked over the tip of the steel rod, and pulled into a triangle between the rod and the forefinger and little finger by spreading the fingers and pulling. The bunch of carrots was then inserted into this triangle and the band released, and at the same time the bunch was moved up and over the rod to release the band from it. Table 3 compares time per crate to top, separate master bunches, and apply rubber bands by conventional and improved methods.

Table 3.--Time per crate of carrots (72 bunches) to top, separate master bunches, and apply rubber bands by conventional and improved methods

Function	Conventional method	Improved method
	<u>Minutes</u>	<u>Minutes</u>
Top and separate master bunches....:	2.748	1.872
Obtain bunches, apply rubber bands, and dispose of bunches.....:	9.288	5.688
Total.....:	12.036	7.560



NEG. BN-4031

#1. Cut tops off, holding them against edge of container.



NEG. BN-4032

#2. Put on rubber band.

Salad Lettuce

Romaine, endive (chicory), escarole, Boston (garden), and bib lettuce are often called salad lettuce. These items were usually received in wirebound crates or used crates of other kinds. Heads per crate varied from 12 to 24. These items were washed in many of the stores.

Trimming methods were usually similar to those described for iceberg lettuce. A head was obtained from a crate and a slice cut from the butt. Damaged leaves were then removed, and discolored ends of leaves pulled off by picking with the knife blade and thumb. The item was then placed in a tub of water or thrown in a sink, and later lifted out to drain. In some stores, the trimmer then applied a paper tie. Since it was common to have one price, with the



NEG. BN-4033

#3. Completed bunch of carrots - topped and banded.

Figure 9. Recommended method of topping bunch carrots.

exception of Boston or bib lettuce, the smaller heads were often tied in bunches of 2 or 3.

Endive, or, as it is known in some southern areas, chicory, was occasionally broken open and the leaves bent out and down to show the heart of the head. Sometimes these leaves were held with a tie.

The major errors by trimmers were in removing too many outer leaves through cutting the butt first, in not cleaning the heads properly, particularly in not taking off enough of the discolored ends; and in handling the heads too many times, causing extra labor and knocking off good outer leaves.

Recommended trimming methods for Boston lettuce and bib lettuce are the same as for iceberg lettuce. Bad leaves are pulled off before the butt is cut.

Romaine, escarole, and endive are held in the same manner as celery, in the left hand, butt toward the heel of the hand, as leaves are inspected and the bad ones pulled off. The head is rolled in the left hand to get to all sides. The left hand is then turned palm up to cut the butt, and turned back to pick over the ends of the leaves. If these items are being tied by the trimmer, one head may be completed and laid aside while a second is trimmed. Then both are picked up together, tied, and placed in a tub or wash basket.

Recommended procedures for trimming increased productivity for all salad items (table 4).

Miscellaneous Items

Chinese cabbage was handled in several of the stores studied, but seldom was displayed or sold in any large quantity. Usually it was trimmed and displayed a few pieces at a time. The trimming procedure was similar to that for romaine or escarole.

French or Belgian endive was handled only rarely. It is somewhat similar to Chinese cabbage in conformation, but much smaller, usually about 4 to 5 inches long. Trimming procedure was similar to that for other compact, leafy items--pulling bad leaves and then trimming off part of the butt. No cutting of the tips of leaves was done.

Bulk spinach was not trimmed, but it was usually handled by the trimmer in washing. Conventionally, a bushel of bulk spinach was dumped in a sink full of water and allowed to soak for a period. It was then picked out by hand and placed in tubs. The improved procedure was to dump one-half bushel into a mesh wash basket and wash the spinach in a sink with a spray nozzle by turning the product in the basket with one hand, while running water over it with the nozzle. This method gave the spinach a more "fluffed up" appearance and washed out grit and sand better than by soaking. If the product was very dirty, the nozzle was removed and an open hose used. The baskets were then allowed to drain, either in the sink or on the sink drainboard, or the basket was placed in a tub. These baskets just fit the interior of the tubs and rested about 1 inch from the bottom of the tub. With this procedure, the item could be loaded or taken to display while draining.

Table 4.--Trimming time per piece for salad items before and after improved trimming techniques were taught in 2 stores

Product	Store A			Store B				
	No ties applied by trimmer			Ties applied by trimmer				
	Conventional	Improved	Savings	Trim	Tie	Total	Trim & tie	Savings
	Minutes	Minutes	Percent	Min.	Min.	Min.	Minutes	Percent
Boston....	.190	.108	43.2	.117	.113	.230	.216	6.1
Romaine....	.248	.128	48.4	.308	.135	.443	.218	50.8
Escarole....	.149	.159 1/	-	.188	.158	.346	.256	26.0
Endive....	.132	.127	3.8	.233	.152	.385	.213	44.7

1/ Poor quality of product in improved test affected time.

FACTORS AFFECTING TRIMMING

Effect of Quality and Condition of Merchandise

Studies in 2 stores revealed a direct relationship between the quality or condition of the produce and the time required to trim the various selected items (table 5). In these studies, trimming methods were held constant, so the only variable was quality. Grading of the quality or condition of the produce item studied was performed by the trimmer in all cases.

Table 5.--Effect of quality on average time per piece to trim 3 produce items

Quality	Pascal celery	Iceberg lettuce	Corn
	Minutes	Minutes	Minutes
Good.....	.134	.154	.085
Fair.....	.192	.183	.114
Poor.....	.232	.220	.132

There was a difference of .058 minute per piece trimmed for good and fair quality pascal celery. For a 2-1/2 dozen crate, this difference amounted to 1.74 minutes. The additional time multiplied by an average of 30 crates received per week resulted in extra time of 52 minutes, or almost an hour additional time spent by the trimmer due to one grade of quality difference for this item only. This does not include additional time which might be required in retrimming.

Banding and Price-Marking Trimmed Produce

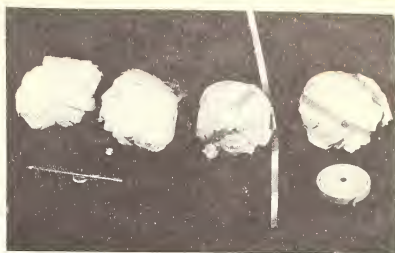
Price-marking with an indelible pencil on the butt was a common pricing method and was usually done at the display counter. This pricing method was followed sometimes even when the produce was banded by the trimmer.

The use of a code which identified the item for the cashiers was the simplest system for produce department personnel (fig. 10). One system used was no mark, one mark, and two marks, indicating respectively the highest price for a given item, second price, and third price. Coding was done by display



NEG. BN-4034

#1. (Left, to right) Price-mark on butt; code-mark on butt; price-mark on twist stem; price-mark on banded tape; code with colored rubber bands.



NEG. BN-4035

#2. (Left, to right) Price-mark on butt; code-mark on butt; price-mark on twist stem; price-mark on banded tape.

Figure 10.--Various methods of price marking trimmed produce items.

personnel. Colored rubber bands were used to accomplish the same purpose for some items. In general, coding produce for price identification caused a time loss to the checkout operation and a time saving to the produce department.

Marking the price on a paper tie was one of the principal methods by which produce was price-marked in the stores studied. Frequently it was the trimmer who marked and applied these ties. Even without marked prices, rubber bands and paper ties were applied by many of the trimmers to prevent outer leaves from coming loose.

Paper ties created a problem in most produce back rooms. Bundles of ties became bent on the ends, and loose ties became tangled and snarled, making them difficult to use. Most trimmers took a handful of ties to the workplace. Those left over seldom were returned to any suitable container and were frequently damaged beyond use or lost.

Several types of holders were developed to hold these ties in position for use (fig. 11). These holders kept each length or price of ties in separate



NEG. BN-4036

#1. Flat tray.



NEG. BN-4037

#2. Meat can adapted to hold ties.



NEG. BN-4038

#3. Rack for handle of dolly.

Figure 11.--Some holders for improved handling of paper ties. Detailed drawings of these pieces of equipment appear in appendix figure 25.

compartments. The low, flat-type containers were best for easy picking up of ties, but the upright compartmented boxes held more sizes. In some stores, luncheon meat cans were salvaged from the meat department and one can was used for each size of tie.

The normal method of applying paper ties was to wrap the tie around the head of produce and hold the tie together at the top. The left hand would then spin the head to twist the tie.

The recommended method of applying paper ties is to hold the head of produce in the left hand and obtain the tie with the right, grasping the tie about 2 inches from the end (fig. 12). The end of the tie is inserted under the left forefinger and the head or stalk rolled down the tie to the right hand. The right hand then grasps the two ends of the tie between the right forefinger and thumb and presses in. Both the left and right hand then make a half turn in opposite directions to twist the tie. An extra half turn can be given if desired. The ends of the tie are folded down by sliding the right forefinger over them as the left hand disposes of the head. The recommended methods reduced the time to apply ties, as a separate operation, by 25 to 40 percent (table 6).

Table 6.--Time per piece to apply ties as a separate operation, conventional and improved methods

Item	Conventional	Improved	Percent time saved
	Minute	Minute	Percent
<u>Store A:</u>			
Lettuce.....	.089	.065	27.0
Celery.....	.129	.077	40.3
<u>Store B:</u>			
Lettuce.....	.113	.085	24.8

Applying ties should be incorporated with either the trimming or display operation. Applying priced ties by improved methods when trimming required an additional .061 minute per piece; applying them at the display required an additional .065 minute per piece; while applying them as a separate operation required .077 minute per piece, plus .009 extra time to handle equipment. Applying rubber bands when trimming required an additional .046 minute per piece; when displaying, an additional .048 minute per piece; and .052 minute per piece to perform as a separate operation, plus .009 minute per piece to handle equipment. Frequently, this operation was performed at the display during the morning setup period and by the trimmer during the rest of the day as a labor-balancing factor and to prevent blocking the display area any more than necessary during peak sales periods. Combining tying with trimming had the additional advantage of preventing loss of leaves and stalks through later handling.

Comparisons were made of the labor and material costs of different methods of banding and price-marking two produce items, celery and lettuce. The least costly method of price-marking celery was with code marks at the display (table 7). However, there were advantages to having a tied stalk. The least



NEG. BN-4039

#1. Hold head, left forefinger extended, approach with tie in right hand.



NEG. BN-4040

#2. Grasp tie with left forefinger, start to rotate head, right hand slips down.



NEG. BN-4041

#3. Completely rotated right thumb starts to grasp other end.



NEG. BN-4042

#4. Grasp complete, start punch in.



NEG. BN-4043

#5. Twist both hands.



NEG. BN-4044

#6. Remove head, forefinger sliding over tie end.

Figure 12.--Recommended method of applying paper ties to trimmed produce.

Table 7.--Cost comparison of methods of price-marking celery for display

Method of pricing	: Direct labor :		: Materials :	: Total cost	
	: per bunch :			: cost :	: Per bunch :
	: Time :	: Cost ^{1/} :	: per bunch :		
	: Minutes :	: Cents :	: Cents :	: Cents :	: Cents :
NO WRAP:	:	:	:	:	:
Price-mark each bunch with an indelible pencil as displayed..	: .043 :	: .108 :	: --- :	: .108 :	: 3.24 :
Code-mark each bunch as displayed.....	: .026 :	: .065 :	: --- :	: .065 :	: 1.95 :
PAPER-COVERED WIRE TIES:	:	:	:	:	:
Price-mark all ties before applying.....	: .111 :	: .278 :	: .264 :	: .542 :	: 16.26 :
Price-mark each bunch with an indelible pencil as displayed..	: .120 :	: .300 :	: .264 :	: .564 :	: 16.92 :
Code-mark each bunch as displayed.....	: .103 :	: .258 :	: .264 :	: .522 :	: 15.66 :
Price-mark low prices only on ties before applying.....	: .094 :	: .235 :	: .264 :	: .499 :	: 14.97 :
ADHESIVE-BACKED PAPER TAPE:	:	:	:	:	:
Price-mark all tape as celery is trimmed ^{2/}	: .131 :	: .328 :	: .310 :	: .638 :	: 19.14 :
Code-mark each bunch as displayed.....	: .114 :	: .285 :	: .310 :	: .595 :	: 17.85 :
Mark low prices only on tape as celery is trimmed.....	: .110 :	: .275 :	: .310 :	: .585 :	: 17.55 :
COLORED RUBBER BANDS:	:	:	:	:	:
Select bands to indicate price..	: .036 :	: .090 :	: .115 :	: .205 :	: 6.15 :

^{1/} Labor at \$1.50 per hour or 2.5 cents per minute.

^{2/} Done by moving banded stalk against a fixed stamp.

costly method with the stalk tied together was with rubber bands, with different colors used to indicate different prices.

The least costly method of price-marking lettuce was also with code marks as displayed (table 8). However, tying the head together has an advantage in reducing loss. The least costly method of pricing with a tie was with paper-covered wire ties, with highest price left blank and lower prices stamped on the ties. The additional cost of pricing all of the heads of lettuce was slight. The principal advantage of paper tape was the merchandising factor of the bright red color and the decreased inventory of supplies, since one dispenser and one kind of tape were sufficient for all items. Paper ties needed special holders, shown in figure 11, for proper use and to prevent damage.

Retrimming of Produce Items

In modern supermarkets, most attention is given to preparing the produce for rapid sale. However, in order to keep a satisfactory quantity and quality of produce on display, some had to be rehandled and retrimmed each day. Stores using ice-bed refrigeration usually took down all the wet produce from the displays each night. Some stores with mechanical refrigeration covered the produce and left it in the display at night, but some of the items had to be retrimmed to maintain an appearance of freshness. In large stores with ice-bed displays, checks show approximately a third of the trimmed produce was retrimmed each week (table 9).

In stores B and D, the low percentage of retrimmed iceberg lettuce was due primarily to letting the counters become depleted at night, to the detriment of sales. In many other cases, however, the quantity of retrims was excessive, because too much merchandise was prepared or too much was carried on the counter up to store closing. In many cases, merchandise that had to be retrimmed had not yet reached the counter but had been held in reserve in coolers.

For some slow-moving items, the number retrimmed equalled the number originally displayed. The quantity of retrimmed produce in large supermarkets is significant in the light of the attitude in most firms that produce is sold in volume and not stored in displays. This attitude has led many firms to eliminate complete refrigeration, on the ground that produce is not held in displays long enough to warrant it. The quantity of retrims in stores of these same firms raises a serious question about this policy.

Retrimming, including all handling, required about one-fourth of the man-hours used in the trimming function. Retrimming produce generally takes more time per piece than the original trimming (table 10), and the time is more variable than in the original trim because of several factors: (1) Often included in retrims are items trimmed but not displayed, and this merchandise may only need a small slice removed from the butt, which takes little time; (2) merchandise which has been on display may vary considerably in condition; (3) often ties must be removed in retrimming, and this requires rebanding. One important factor in retrim time was the way in which retrims were stored when removed from display counters. This operation was identified in stores as "take-down."

Table 8.--Cost comparison of methods of price-marking lettuce for display

Method of pricing	: Direct labor :		: Materials :	: Total cost	
	: per head :			:	
	: Time :	: Cost ^{1/} :	: cost :	: Per head:	: Per crate
	: Minutes:	: Cents :	: per head :	: Cents :	: of 24
NO WRAP:	:	:	:	:	:
Price-mark each head with an indelible pencil as displayed..	.036	.090	---	.090	2.16
Code-mark each head as dis- played.....	.026	.065	---	.065	1.56
PAPER-COVERED WIRE TIES:	:	:	:	:	:
Price-mark all ties before applying.....	.119	.298	.320	.618	14.83
Price-mark each head with an indelible pencil as displayed..	.121	.302	.320	.622	14.93
Code-mark each head as dis- played.....	.111	.278	.320	.598	14.35
Price-mark low prices only on ties before applying.....	.094	.235	.320	.555	13.32
ADHESIVE-BACKED PAPER TAPE:	:	:	:	:	:
Price-mark all tape as lettuce is trimmed <u>2/</u>147	.368	.444	.812	19.49
Code-mark each head as dis- played.....	.131	.328	.444	.772	18.53
Mark low prices only on tape as lettuce is trimmed.....	.116	.290	.444	.734	17.62

1/ Labor at \$1.50 per hour or 2.5 cents per minute.

2/ Done by moving banded head against a fixed stamp.

Table 9.--New merchandise trimmed, retrims, and percent of retrims in 4 stores for a test week 1/

Item	Store A			Store B		
	Total	Total	Percent	Total	Total	Percent
	pieces	pieces	retrimmed	pieces	pieces	retrimmed
	of new	retrimmed:		of new	retrimmed :	
	Pieces	Pieces	Percent	Pieces	Pieces	Percent
Lettuce, iceberg...	1,558	394	25.3	1,543	118	7.6
Lettuce, romaine...	36	7	19.4	142	100	70.4
Lettuce, Boston...	59	19	32.2	0	0	0
Celery, pascal....	549	371	67.6	1,144 <u>2/</u>	352	30.8
Celery hearts.....	165	43	26.1	---	---	---
Celery, white.....	108	83	76.9	---	---	---
Cabbage, green....	304	132	43.4	357	166	46.5
Cabbage, red.....	44	58	131.8	29	42	144.8
Cabbage, Chinese...	12	48	400.0	0	0	0
Endive.....	67	72	107.5	96	71	74.0
Escarole.....	38	42	110.5	88	51	58.0
Corn.....	583	71 <u>3/</u>	12.2	360	0 <u>4/</u>	0
Cauliflower.....	598	103	17.2	190	162	85.3
Savoy cabbage.....	0	0	0	32	86	268.8
Total.....	4,121	1,443		3,981	1,148	
Average per-						
cent retrim..			35.0			28.8
Item	Store C			Store D		
	Total	Total	Percent	Total	Total	Percent
	pieces	pieces	retrimmed	pieces	pieces	retrimmed
	of new	retrimmed:		of new	retrimmed :	
Lettuce, iceberg...	1,152	354	31.0	1,581	277	17.5
Lettuce, romaine...	122	65	53.3	177	166	93.8
Lettuce, Boston...	45	95	211.1	216	209	96.8
All celery.....	352	213	60.5	759	692	91.2
Cabbage, green....	192 <u>5/</u>	25 <u>5/</u>	13.0 <u>5/</u>	195	71	36.4
Cabbage, red.....	---	---	---	28	10	35.7
Cabbage, Chinese...	0	0	0	18	29	161.1
Endive.....	152	109	72.0	78	106	135.9
Escarole.....	71	92	130.0	83	76	91.6
Corn.....	1,212	98	8.1	905	0	0
Cauliflower.....	30	7	23.3	0	0	0
Total.....	3,328	1,058		4,040	1,636	
Average per-						
cent retrim..			31.8			40.5

- 1/ Miscellaneous items such as bunch carrots, spinach, and parsley excluded.
2/ Includes all celery (pascal celery, celery hearts, and white celery).
3/ Sorted over but only occasionally retrimmed, usually at counter.
4/ Corn not retrimmed.
5/ Both green and red cabbage (no Chinese cabbage).

Table 10.--Time per piece to trim new produce and retrim produce removed from counter in 4 stores

Product	Store A		Store B	
	Trim	Retrim	Trim	Retrim
	Minute	Minute	Minute	Minute
Lettuce, iceberg....:	.105	.115	.186	.233
Celery, pascal.....:	.132	.140	.194	.167
Cabbage, green.....:	.089	.113	.191	.174
Cauliflower.....:	.246	.252	.206	.258
Boston lettuce.....:	.122	.173	.236	.201
Romaine lettuce.....:	.143	.195	.259	.223
Escarole.....:	.230	.196	.145	.260
Endive.....:	.181	.199	.185	.269
Corn.....:	.063	.085	.100	.118
Bunch carrots.....:	.102	.110	.173	.184
	Store C		Store D ^{1/}	
	Trim	Retrim	Trim	Retrim
	Minute	Minute	Minute	Minute
Lettuce, iceberg....:	.105	.135	.193	.238
Celery, pascal.....:	.144	.099	.229	.191
Celery hearts.....:	-	-	.193	.244
Cabbage, green.....:	.060	.162	.098	.177
Cauliflower.....:	.224	.371	.191	.247
Boston lettuce.....:	.108	.097	.216	.168
Romaine lettuce.....:	.128	.093	.218	.280
Escarole.....:	.159	.125	.256	.267
Endive.....:	.127	.127	.213	.380
Corn.....:	.072	.093	.064	- ^{2/}

^{1/} Includes time to apply ties or rubber bands where used.

^{2/} Corn not retrimmed.

In most of the stores studied, the produce was taken down each night at the close of business. In some stores, retrims were mixed with other merchandise which did not require retrimming but was returned directly to the counter. This made it difficult for the trimmer to get the retrims, and often extended the time before the other items were taken to the display counters. Stacking the items indiscriminately in tubs also made the task of the trimmer difficult when checking the quantity of retrims in the morning. An inaccurate count of retrims often resulted in trimming too much new produce for the original setup and, because of slow movement, the retrims were left in the back room until much later in the day.

Many trimmers worked the retrims along with the new merchandise for the morning setup, which resulted in much hunting for retrimmed items and slowing of the trimmer during the morning period, when the basic setup was being prepared.

Recommended procedures for take-down and handling of retrimms were:

1. Take down items that will require retrimming on a separate cart from other merchandise.
2. Stack each different item in tubs or containers so the item is visible at the top of the tub, to facilitate inspection and approximation of quantity by the trimmer.
3. Require the trimmer to check the retrimms (quantity and quality) before trimming up the basic setup of new produce.
4. Have the trimmer do all retrimms at one time, after necessary basic setup of new merchandise is complete.
5. Add retrimmed produce, as soon as available, to basic display.

Scheduling of the Trimming Job

The volume of produce in most supermarkets makes the job of trimming less than a full-time operation for one person. In smaller markets, appointing the trimmer to care for the wet rack is one effective way to utilize his time more fully. This gives the trimmer firsthand knowledge of the movement of the trimmed items and of the quantities he needs to trim.

A record sheet which gives estimated needs and quantities processed has proved advantageous in large markets, as well as in markets where the trimmer is assigned other duties. Such a record, if properly used, serves as a task assignment, prevents trimming too much merchandise, keeps a check on retrimms, and gives the manager a daily movement guide. One type of form used for this purpose is shown in figure 13. This sample form has been filled in to illustrate how it should be used.

Storage of Produce

Some of the slower moving produce items are often trimmed a half case or less at a time, especially in the small-volume stores. Storage of part cases in coolers often interferes with storage of other items. The wire mesh baskets, recommended for washing produce, were found excellent for storage of these part cases of produce. Racks designed to hold either the baskets or standard trim containers were built in coolers for storage of untrimmed and trimmed produce (fig. 14). Storage of items such as chicory in these baskets gave the product a chance to "fluff up" and improved its appearance when it was placed on display.

Trimmed merchandise handled in whole case units should be stored in the cooler so that the items are accessible. Considerable time was lost by the trimmer in some stores by having to dig merchandise out of the cooler. When the merchandise needed in the next morning setup was set aside on a separate handtruck during the afternoon consolidation of the cooler, there was a big saving in labor the next morning. Frequently, steps can be saved for both the receiver and trimmer if some of the merchandise which is to be trimmed

DATE: _____

DAY: _____

Produce manager fills out columns A & D the night before
 Trimmer fills out columns B & E first thing in the morning
 Trimmer keeps record in columns C & F as he trims

	A	B	C	D	E	F	
	Required for setup	Trimmed ahead, not displayed	New trimmed for setup	Additional required for rest of day	Retrim	Additional new actually trimmed	Total new trimmed
Lettuce, iceberg	3	1	11	6	1	11	7
Celery, pascal	3		111	4	2	11	5
Celery, white	1		1	1	1/2	1	2
Celery hearts	1		1	1	1/2	1	2
Cauliflower	2	1	1	6	1	11	6
Corn	2		11	5	1/2	1	3
Cabbage, green	2		11	1		1	3
Cabbage, red	1		1				1
Cabbage, Chinese	1/2		✓				
Romaine	1		1	1		1	2
Endive	1		1				1
Escarole	1		1				1
Carrots	2		11	1		1	3

Packaging - (this work done in the afternoon for tomorrow morning)

Tomatoes	10	2	1111				4
Brussel sprouts	2		11				2
Pears	2		11				2
Pears							
Apples	2	1	1				1
Apples							
Plums							
Prunes							
Grapes							
Grapes	2		11				2
Oranges	1		1				1

Figure 13.--A form used to list work required of and done by the produce trimmer.

immediately is moved directly from the delivery truck to the trim station, instead of putting the entire load into storage.

GARBAGE, TRASH, AND SALVAGE HANDLING

Two major byproducts result from the trimming operation: Trimmed waste and empty boxes. Both create handling problems, take up space, and obstruct work areas and aisles.

Conventional Garbage Handling Methods

In conventional trimming operations, garbage handling took about 3 to 4 percent of the trimmer's time and usually considerable time of other employees in taking garbage to storage rooms and otherwise handling it.

NEG. BN-4045

Figure 14.--Storage rack for produce cooler.

hazard. Handling trimmings in empty produce crates and boxes caused a great deal of confusion and extra handling. Some of this was done in most stores, because of lack of sufficient garbage cans (fig. 15). While most stores were originally equipped with enough garbage cans, few had enough of them available for use because the cans were damaged or rusted out and not replaced. The most common difficulty was lack of accessibility in garbage rooms. Cans were emptied and often stacked in garbage rooms in a satisfactory manner, but garbage and trash were thrown in the room, blocking or hiding empty cans. This can be remedied by removing empty cans to the back room as soon as garbage is picked up, and holding them there until used.

Improved Garbage Handling

The most effective way of handling garbage in cans was to trim directly into cans mounted on a small dolly (fig. 16). When full, the cans were wheeled out and empty ones placed on the dolly.

Trimming methods involving "hacking" created the worst floor conditions. It was found that a trimmer could keep the floor reasonably clear by trimming into a 30-gallon garbage can or similar larger opening, when the container was mounted directly in front of the trimmer with the rim about 32 inches from the floor. The front rim of the "garbage



NEG. BN-4046

Figure 15.--Handling garbage in empty boxes creates congestion and disorder.

catcher" should never be higher than 36 inches. In providing a "catch bin" for the disposal unit, similar heights should be observed, but the catch bin can be made wider than a garbage can to extend across the front of the operator.

Garbage disposal machines, when properly built into a workplace, can solve many of the trimmer's garbage-handling problems and reduce the handling time, if excessive maintenance and cleaning time are not required. However, with all existing machines, some provision should be made in the workplace for trimmings that the device will not handle (especially from corn) and the trimmer should not be required to set up a separate workplace for such items.



NEG. BN-4047

Figure 16.--Garbage-can dolly used in trimming.

Garbage Disposal Units

Studies were made of a number of trimming operations which included garbage disposal or garbage reducing devices. In general, these devices reduced space requirements and improved the trimming operation by reduced handling of garbage, but several difficulties were noted with existing installations of these machines. Some trimmers were found to be following the dangerous practice of packing garbage into the machines by hand or feeding the devices with a stick or other implement. Few of the machines had feeds which would take trimmings directly as they fell during the trimming operation. Sometimes this was due to the capacity of the machine. Most of these devices were disposal units only and were not incorporated into a proper workplace for the trimmer. Space for crates, tubs, tools, and materials, had to be provided in addition to and separate from the device and this frequently could not be or was not done satisfactorily. A number of these devices were furnished in "stripped down" condition, to be built into other workplaces. Usually these were built into the sink drainboards, which did not provide a satisfactory work area.

Many of these devices would not handle all of the waste from a trimming operation. None of those investigated would properly handle the quantity of corn trimmings found in most supermarkets.

Several of these machines were incorporated into improved trimming workplaces with satisfactory results. This usually involved building special equipment to attach to or incorporate with the disposal unit.

Complete studies were made of two types of these machines. One was a hammermill device which ground the trimmings, mixed them with water, and fed them down the sewer lines. The other was a pulping device which ground the trimmings and pressed out the water, leaving a damp pulp compressed to about one-seventh of its former bulk. The water, clear of solids was dumped into the sewer. With this device, some trimmings still had to be disposed of, but it could be installed in areas where sewage regulations would not permit the

other type. The use of both these installations showed considerable savings in costs (table 11).

Table 11.--Annual garbage handling costs in 2 stores before and after installation of a garbage disposal unit and a garbage reducer unit ^{1/}

Expense item	Store A	Store B
	Dollars	Dollars
BEFORE UNIT WAS INSTALLED		
Trash pickup cost.....	866.84 ^{2/}	2,410.49
Garbage cans.....	115.00	115.00
Store handling labor.....	263.64 ^{3/}	338.00
Annual cost.....	1,245.48	2,863.49
	Garbage disposal unit	Garbage reducer unit
AFTER UNIT WAS INSTALLED		
Trash pickup.....	-	1,189.76
Depreciation ^{4/}	145.67	160.00
Installation ^{4/}	10.00	2.50
Maintenance.....	15.00	15.00
Water.....	137.70	3.90
Electricity.....	91.80	23.40
Store handling labor.....	-	231.92
Garbage cans.....	-	16.42
Annual cost.....	400.17	1,642.90
Annual savings.....	845.31	1,220.59

^{1/} Costs not comparable because of differences in store location and garbage pickup costs.

^{2/} Garbage only.

^{3/} Excess over labor required with the disposal unit.

^{4/} Depreciated over 10 years.

Several factors should be considered before installing these devices in any store. Garbage and trash pickup costs vary considerably from area to area and store to store. Some stores have garbage picked up at no cost to them. In both stores, reduction in garbage pickup costs was an important cost-saving factor. The major cost saving in garbage pickup in store B, for instance, was in the reduction in the amount of trash and garbage, to a point where pickups were reduced from 6 to 3 per week. This depended again on the volume and the space available for storage of trash and garbage.

There were considerations other than operating costs. Both devices reduced the space required for garbage storage and resulted in somewhat cleaner back rooms. Some time was saved in hauling garbage to storage rooms and handling garbage cans, but cleaning and maintaining the garbage reducer machine used most of the time saved in store B. An important factor in installing these devices is to provide a quick shut-off control at the point the operator usually works, so the machine can be shut off or turned on as the operator works.

WORKPLACE AND EQUIPMENT

Containers Used for Trimming

Several types of containers were used for handling trimmed produce, ready for display. Most stores used empty crates or boxes at least part of the time for this purpose (fig. 17).



NEG. BN-4048

#1. Crate or box.



NEG. BN-4050

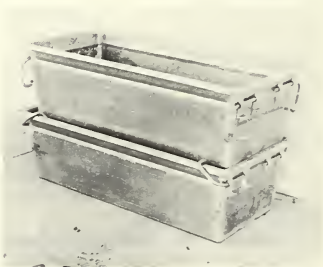
#3. Plastic tubs

Figure 17.--Several types of containers used for handling trimmed produce.



NEG. BN-4049

#2. Galvanized tub.



NEG. BN-4051

#4. Aluminum tub.

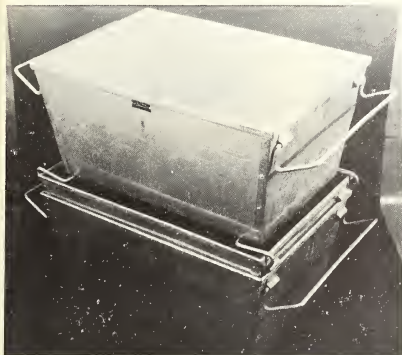


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#5. Rectangular tub.

Some of the special types of containers used were galvanized round washtubs 10 inches high by 22 inches in diameter, galvanized square washtubs 11-1/2 inches high by 20-1/2 inches square, a plastic tub 10 inches high by 19 by 25 inches, aluminum banana tubs, an aluminum tub similar to a banana tub but 20 by 29 by 12 inches in size, and some rectangular galvanized trays 8 by 20 by 28 inches which could not be nested and were carried in a special dolly rack. These last trays and dollies were difficult to load with produce, required extra space in the back room, and held a small load, and were inefficient for display. In one store, a wash basket with bales, like a banana box, was developed for handling wet produce.

The most efficient method of handling trimmed produce was in nestable tubs which could be stacked. These were loaded on handtrucks for display, usually 4 tubs to a load (fig. 18). Wire washbaskets were provided, which fit inside the tubs but rested about 1 inch from the tub bottom for draining. The approximate optimum size for these tubs was found to be: top, 26 by 17 inches; bottom, 23 by 14 inches; depth, 12 inches.



NEG. BN-4053

Figure 18.--Improved containers for handling trimmed produce.

Although many of the stores were equipped with one or more large sinks for washing purposes, these were seldom used. In most cases the large sinks and drainboards took up space that could have been used more advantageously for other purposes. The sinks also tended to be a collection point for odds and ends of produce, plants, materials, and crates.

When produce was washed, the trimmer usually filled the sink and then trimmed each piece of produce and threw it into the water. When he completed trimming, or after a soaking period, the produce was removed by hand and placed on the drainboard. Later this produce was transferred to a tub. Some trimmers put the produce in empty crates to drain and later took these to display. Since some of the water often did not drain quickly from produce in crates, it continued to drain on the sales floor.

Tubs of the recommended dimensions held approximately 2 crates of trimmed lettuce, piled up, when merchandise was to go directly to display. When tubs were to be stacked, they held less. Merchandise and tub were of a weight easy to lift and handle. Large celery was the key item; the dimensions of these tubs permitted bunches to be placed in the bottom sideways. The tubs could be nested and put away when not in use.

Equipment for Washing Produce

In the stores in which studies were conducted, washing was not a major factor for most items. Some stores washed celery and spinach and, during certain seasons, Boston lettuce and escarole. Most of the produce received was in a condition which did not require soaking.

Wash baskets were adapted for washing produce after trimming, and in them the produce was either dunked or sprayed with an overhead hose equipped with a pressure nozzle (fig. 19). These wash baskets were designed to fit into containers developed for handling trimmed produce. Produce in baskets could be placed in these tubs, and draining could be completed on the way to the display. With this procedure, only a small sink and drain, located out of the major trimming workplace, was necessary. A small sink was designed with a 24-by 30-inch basin and a drainboard of equal size $\frac{4}{4}$ (fig. 20). The sink was equipped with a special trash-catching strainer, with holes small enough to prevent large pieces of trash from going down the drain but large enough to prevent clogging of the strainer by the large quantity of trim scraps found in trimmer's sinks. A sink of this size proved adequate for necessary washing of produce in even the largest of supermarkets.



NEG. BN-4054

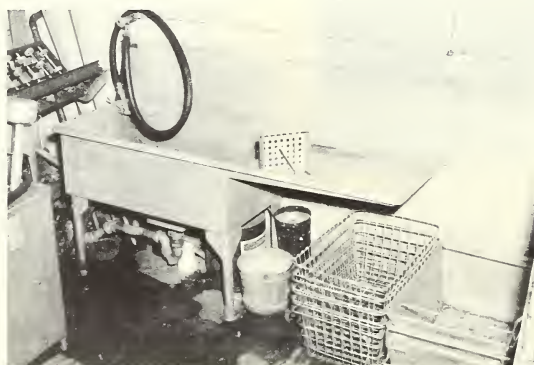


NEG. BN-4055



NEG. BN-4056

Figure 19.--Several types of mesh baskets developed or used for washing produce.



NEG. BN-4057

Figure 20.--Sink designed for produce washing.

4/ Appendix figure 26 gives details of this sink design.

Carts and Dollies

Several firms used a dolly for handling produce which held 4 rectangular metal racks, placed on the 4 shelves of the dolly (fig. 21). The racks did not nest and the dollies took up considerable space. In addition, it was difficult to work from the racks when they were in the dollies.



NEG. BN-4058



NEG. BN-4059

Figure 21.--Types of handtrucks and dollies used for handling trimmed produce.

Another produce handtruck frequently used was the 2-deck handtruck. In a few stores, a low handtruck was used which held more tubs or boxes but, in order to obtain a proper working height, tubs had to be stacked. The 2-deck handtruck with nestable tubs was found to be much better, since a proper work surface was provided which eliminated extra handling of tubs and prevented damage from dropping of produce. However, the low dollies were especially suitable for large loads and for taking the produce off display racks in the evening.

Workplace Arrangement

The workplace for performing the trimming operation in the stores studied usually consisted of one large sink with drainboards on either end (fig. 22). In some stores, tables were provided for the trimmer, and on them produce was collected while trimming. The trimmers usually worked in the area in front of the sink, placing crates of merchandise and trim tubs on top of garbage cans, empty crates, or handtrucks. Setting up each crate to trim was time-consuming. The area was usually congested with extra carts, empty crates, tubs, and garbage cans, which created a difficult working area and interfered with traffic flow.

There frequently was no adequate storage area for produce tubs, and they were not the proper shape or size. Frequently there were not enough tubs for all the produce. Many of the tubs would not nest when empty nor stack when full.



NEG. BN-4060



NEG. BN-4061

Figure 22.--Conventional trim workplaces.

Handtrucks were not available for the trimmer when needed, or had no proper storage place, and were left by other clerks to clutter the trim area.

There frequently was no storage place for tools and materials, or they were too far from the trim area. Materials such as ties were frequently damaged by lack of a proper storage area.

Knives were not kept sharp, and few trimmers had a sharpening stone.

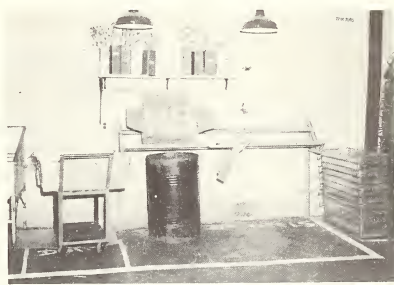
The product was frequently carried from the cooler to the trim area, or several crates were hauled on a handtruck and dropped on the floor.

Improved trim work stations were developed and tested for several different types of operations. The following principles of workplace arrangement were developed:

1. Provide means of getting and positioning several crates of merchandise to trim at one time.
2. Position crates of merchandise close to and in front of the operator so merchandise can be removed easily without damage. Best results were obtained with the crate tilted 45 degrees toward the operator.
3. Provide a disposal point for trimmings, so that trimmings accumulate without spilling.
4. Provide a disposal point for trimmed produce close to the operator, preferably to the left side, and adequate for more than one tub for sorting.
5. Have the disposal point high enough so that trimmed produce is placed, not dropped.
6. Provide an adequate storage place for tools and materials, close to the operator and with tools and materials pre-positioned for use.
7. Provide a small sink with drainboard for washing, located near but not in the main work area.

8. Provide an adequate number of tubs that nest and stack.
9. Provide some wire baskets for washing and draining.
10. Locate tubs, baskets, handtrucks, and storage areas close to the work station.
11. Locate the trimming area near the cooler, with the cooler door opening toward the trim station.
12. Provide a storage area close to the trimmer for disposal of empty crates and boxes.
13. Store the supplies in a dry area near the trimmer.
14. Provide a sharpening stone.
15. Provide a convenient, quick-action control for disposal machines, if used.

An improved trim station using these principles was developed which consisted of a V-shaped holding conveyor, constructed from 2 roller skate conveyors, with the garbage collection point directly under the conveyor (fig. 23). A simpler and cheaper version involved only a holding rack made of pipe.



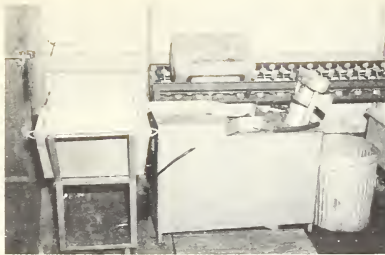
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NEG. BN-4063

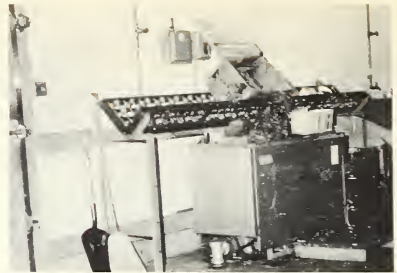
Figure 23.--Improved trim stations. Detailed drawings of this equipment appear in appendix figures 27, 28, and 29.

Several crates were loaded on the conveyor or holding rack at one time and rolled or slid to the work position as needed. Garbage was collected on a low cart with two garbage cans on it. When these were full, the cart was wheeled to the garbage room or garbage storage area, and empty cans were obtained. The holding conveyor also was incorporated into a workplace arrangement with several types of disposal units (fig. 24).

Tubs for trimmed merchandise were placed on a handtruck, usually parked directly to the left of the operator. A supply shelf was provided nearby



NEG. BN-4064



NEG. BN-4065

Figure 24.--Two types of garbage disposal machines used with trim stations.

where knives and materials were stored in racks on the front of the conveyor. A sloped cutting board also was provided for use with some items. Tubs and baskets were stored nearby, and a small wash sink was located beside the conveyor.

Space for empty box and crate storage was provided for in the trimmer's work area. Produce was trimmed or trimmed and priced in one operation, and placed in tubs or baskets on the handtruck. When one truck was loaded, it was pushed aside for later use in the display, and another one obtained for further trimming.

RESULTS OF IMPROVEMENTS IN TWO STORES

Installations of improved produce trimming workplaces and improved trimming methods were made in more than 25 stores. In 2 stores where complete time-study records were kept before and after installation and training, considerable time savings resulted. In one store, all the pricing was done at the trim station. In the other, all pricing was done on the display floor. One store with about \$3,500 weekly volume in produce saved 8-1/2 hours per week, which was an overall increase in production of 48.4 percent (table 12). Nearly 6-1/2 hours were saved in the actual trimming and retrimming and more than 2 hours in handling. However, some additional jobs were handled by the trimmer in the improved operation, not included previously, which gave an additional advantage to the improved operation. The trimmer did all cleanup, salvage, and trash handling as he worked, instead of leaving it until the end of the day to be done by other employees. With the trimmer doing that job, a much neater and more orderly back room was maintained, which favorably affected all the produce department work.

In a second store, with \$5,000 weekly volume, 16.4 hours were saved, which was an increase in production of 61.5 percent. Of this, 12.1 hours were saved in handling, and 4.3 hours in trimming, pricing, and washing. In addition, quality improvement in the product was noted, and trimming interfered less with the other operations.

Table 12.--Trimming and trim handling time per crate in two stores before and after adopting improved methods and equipment

Operation	Store A		Store B	
	Trim only, no pricing		Trim and price	
	Before	After	Before	After
	Minutes	Minutes	Minutes	Minutes
Trim new produce, including :				
banding.....	4.966	2.980	4.637	3.596
Retrim, including banding....	1.716	1.084	1.607	1.554
Washing.....	.482	.211	.233	.116
Open container.....	.271	.224	.280	.232
Obtain and dispose of produce:	.667	.543	.988	.291
Handle carts.....	.008	.011	.180	.046
Handle containers.....	.321	.247	.458	.051
Supplies and tools.....	.055	.046	.302	.088
Empty boxes.....	.311 ^{1/}	.626 ^{1/}	.666	.396
Garbage and trash.....	.342	.259	.292	.106
Sweep and clean.....	1.302	.539	.883	.476
Miscellaneous.....	.108	.218	.260	.083
Handle for retrims ^{2/}956	.764	1.289	.443
Total time per container:				
of new produce.....	11.505	7.752	12.075	7.478
Personal and fatigue				
allowance, 15 percent..	1.726	1.163	1.811	1.122
Standard time per con-				
tainer of new merchan-				
dise.....	13.231	8.915	13.886	8.600
Savings per container...		4.316		5.286
Savings in hours.....	8.6 hours		16.4 hours	
Percent increase in pro-				
duction.....	48.4		61.5	

^{1/} Performed by another person before - all done by trimmer after improvements.

^{2/} Average percent rehandled X total of operations 5 through 12.

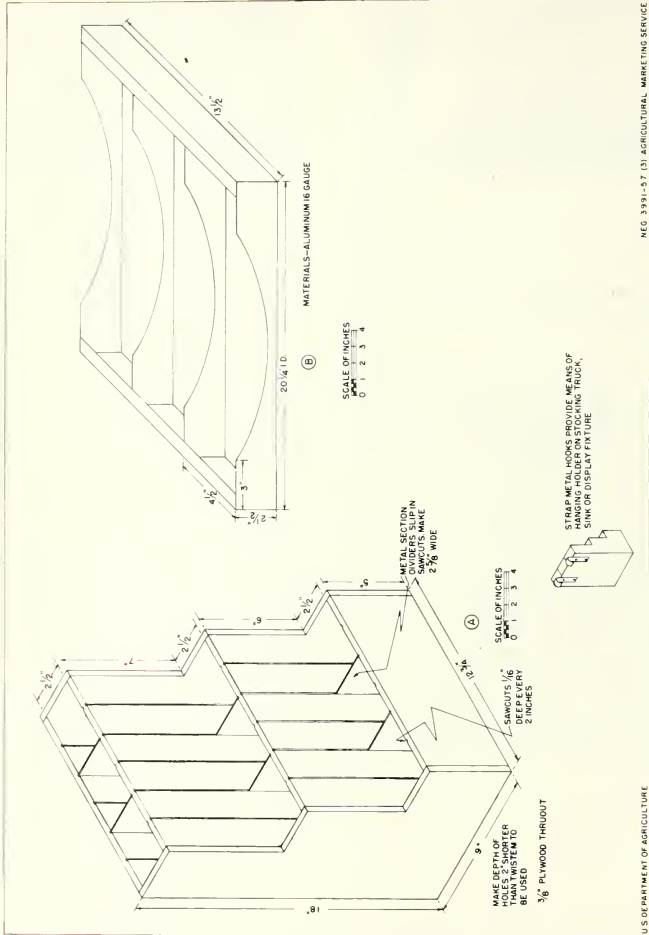
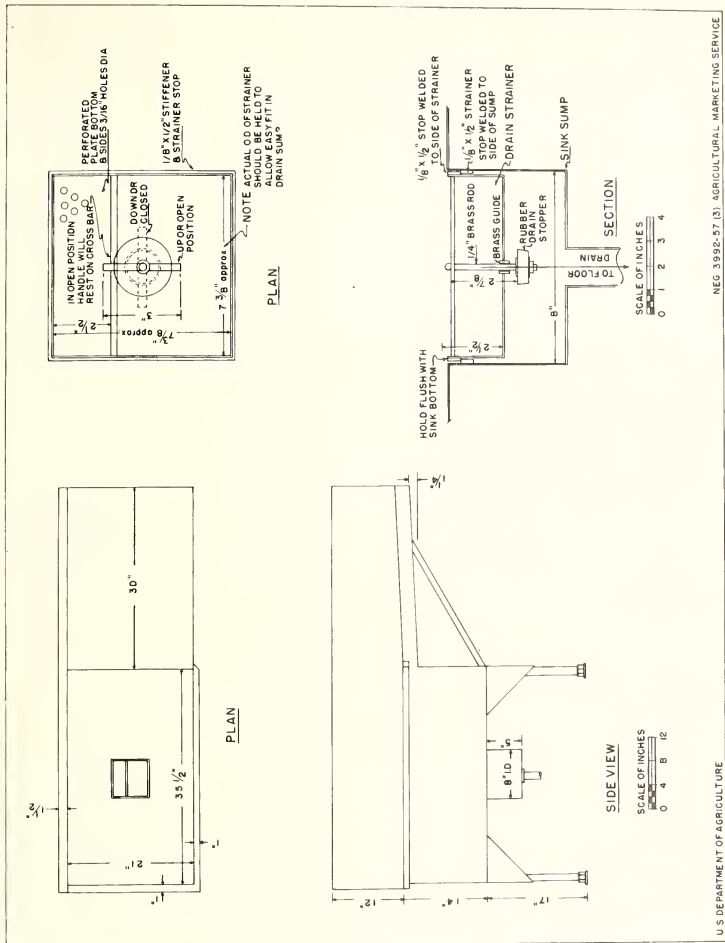


Figure 25.--Diagrammatic drawing of 2 types of holders for paper-covered wire ties.



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Figure 26.--Diagrammatic drawing of a small sink recommended for produce trimming installations.

TRIM CONVEYOR ASSEMBLED FROM STANDARD
WHEEL TYPE CONVEYOR. REAR SECTION IS
12" SIZE. FRONT SECTION CUT DOWN TO 8" SIZE

6 1/2' SECTION WILL HOLD 3 CONTAINERS
SUPPORTS ARE 1 1/2 x 1 1/2" ANGLE AS SHOWN
HEIGHT FROM FLOOR 31" AS SHOWN
DISTANCE FROM SUPPORTING WALL NO
LESS THAN 13 1/2" AS SHOWN

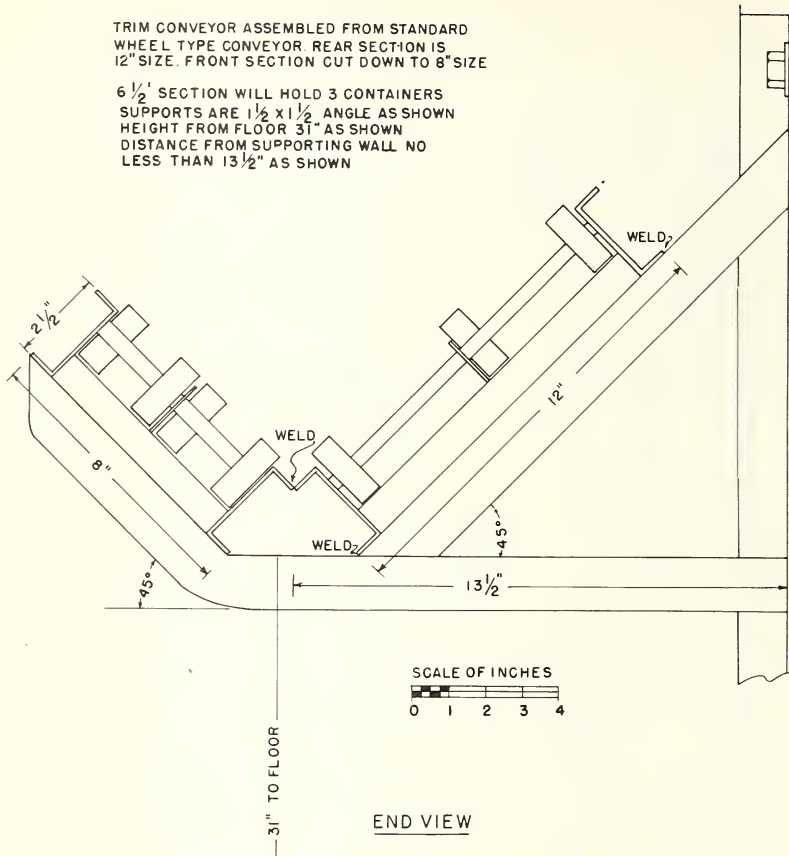
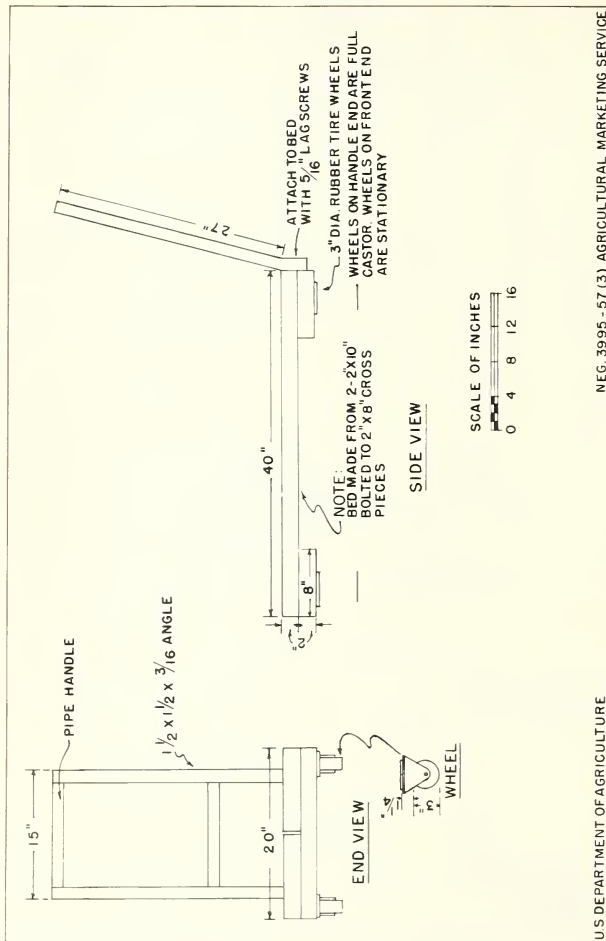


Figure 27.--Diagrammatic drawing of a wheeled-type stand for produce trimming, with accessories.



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Figure 29.--Diagrammatic drawing of a low handtruck for handling garbage cans with the trim stands shown in figure 28.

