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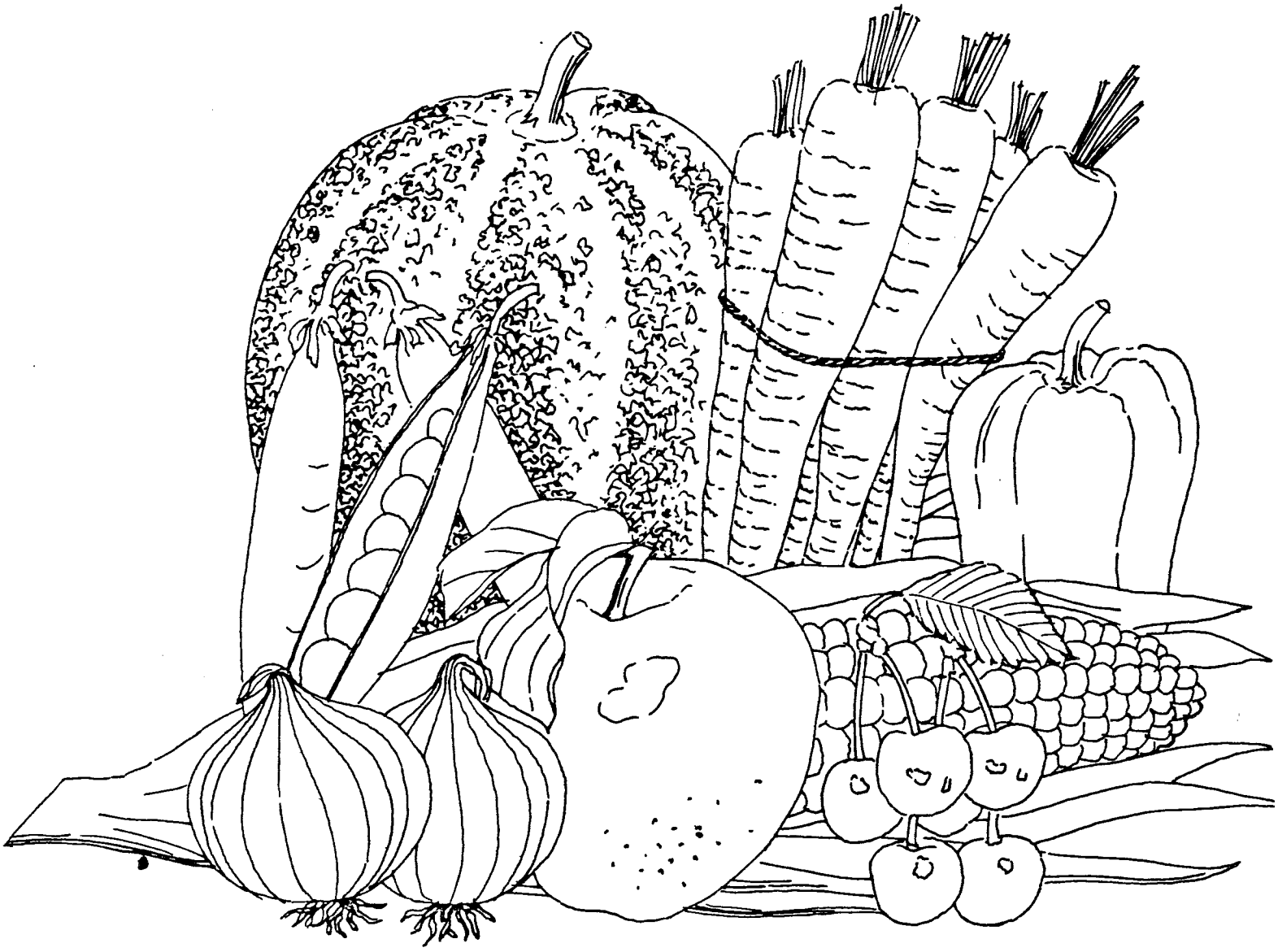
BERRIES FOR PROCESSING

SHIPPING POINT INSPECTION INSTRUCTIONS



UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
FRUIT AND VEGETABLE DIVISION
FRESH PRODUCTS STANDARDIZATION AND INSPECTION BRANCH

SHIPPING POINT INSPECTION HANDBOOK FOR BERRIES FOR PROCESSING

Washington, D. C.
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1/ The only change in this reissue of March 1957 is in the name of the organization.

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INSPECTION OF BERRIES FOR PROCESSING

INTRODUCTION

(1) Blackberries, dewberries and other similar types of berries, such as Boysenberries, Loganberries and Youngberries, all belonging to the genus Rubus, are cultivated quite extensively in many parts of the United States, particularly the Pacific States, the Central States, and the Middle and South Atlantic States. Blackberries and dewberries also grow wild along fence rows and in valleys and ravines throughout these States. Many of these wild berries are harvested and sold to processors. Some quantities also find their way to fresh market and, taken as a whole, the harvesting of these wild berries furnishes considerable income to people living in such sections of these States.

(2) Processors in the Pacific Northwest obtain the bulk of their supplies from growers of cultivated berries. However, in certain eastern sections, such as eastern Tennessee, many processors secure almost all of their supplies from pickers of berries that grow wild. Many of them engage truckers to make daily trips through certain regions to pick up berries picked by the inhabitants during the day. Some truckers act as buyers and pay cash to pickers for the berries, then haul to the processor who will bid the highest for the load.

HARVESTING AND HANDLING

(3) Most berries are picked in the regular berry baskets used in the particular locality where grown. They may be 1/2-pint, 1-pint or 1-quart size. Secondary containers or crates for holding the cups or baskets are of various sizes and types. Crates most commonly used in the eastern part of the country hold 24 pints or 16, 24, and 32 quarts. In the Middle West, crates are usually made for holding 24 pints or 16 quarts.

(4) In the Pacific Northwest cultivated berries are handled from the field to the plant in cannery flats which hold one layer of cups. However, these cups have special dimensions of $5\frac{1}{4}$" x $5\frac{1}{4}$" x 2" and are not used in handling of berries for fresh market. The flat, which is approximately 24" x 17" x $2\frac{1}{2}$", is constructed with a divider through the center to give it strength and holds 12 cups. It has no cover. In loading on the truck the flats are loaded as high as the roof will permit. At the processing plant a stack of flats is handled with a trucking board under the stack to permit the prongs of the handtruck to slide under the stack. The cups are never removed from these flats except in case of accidental spilling. When the dumper dumps a flat of berries onto the grading belt or into the wash tank ahead of the grading belt, he swings a hinged frame of heavy wire rods down onto the flat; then swings the frame and flat together over and forward to empty all of the berries in the flat with one movement. One rod over the center of each row of cups retains the cups in the flat. This system of handling berries is not only labor saving but it holds mechanical damage to the berries to a minimum.

(5) Wild blackberries of western Washington and Oregon are picked by the natives and delivered to processors in cans and buckets of various sizes.

SAMPLING

(6) Trial inspection of blackberries in 1946 demonstrated that inspection would have to be done rapidly in order to be practicable. In Tennessee where several processors accept deliveries of wild blackberries, most truckers arrived at receiving stations between 6:00 P.M. and 9:00 P.M. Settlement for the berries is made after the berries are weighed and unloaded. Thus, the inspector must calculate the grade of the berries on the load in a comparatively short time.

(7) Since each crate or flat may contain boxes picked by several different pickers, the inspection will be more accurate by making a rapid inspection of part of the berries in several boxes from different containers rather than a detailed inspection of all the berries in a few boxes from a few containers. As a minimum the inspector should aim to analyze at least a part of the berries in one cup in every five containers of berries in the lot. If crates are lidded it is also advisable to raise the lids on many crates from which samples are not taken in order to ascertain whether boxes selected as samples are representative.

EQUIPMENT

(8) The following equipment is necessary for making grade determinations and reporting results:

1. Work table.
2. Scales (scales with beams graduated in grams are preferable).
3. Pans or trays for holding samples and defects.
4. Inspector's note sheet.
5. Inspection memoranda.

(9) A scale with beams graduated in grams should be provided for berry inspection if possible, because percentage calculations can be made so much easier. Scales with beams graduated in pounds and ounces and fractions thereof are usually not sensitive enough to weigh accurately small amounts of defective or off-colored berries.

INSPECTION PROCEDURE

(10) The inspection table should be set up near the point of unloading the berries and where there is good light. If the inspector must work under artifical light, as is often the case, daylight bulbs should be provided. As soon as a truck backs up to the unloading platform the inspector should start his inspection. The following procedure was found to be rapid:

First lift the lids on a few crates to get a general idea of the quality of the load. Then select a cup from a crate or cannery flat, carry it to the grading table and empty it into the grading pan. A regular strawberry grading pan is a handy utensil if available. Next pour part of the berries back in the cup, then weigh out the required weight on the scales. The size of the weighed sample to take will depend somewhat on the time that the inspector has for making his inspection of individual loads. If the time is short, perhaps a 200-gram sample from each cup will suffice. If time permits, a larger sample would be better. (11)

After weighing the sample, pour the berries from the scale pan back into the grading pan and quickly pick out the off-colored and otherwise defective berries, placing them on small trays. When the separations of the off-colored and defective berries are complete, they should be weighed and the amounts recorded on the note sheet. Additional samples should then be taken and handled in the same manner and when the inspection for the load is completed the percentages of off-colored and defective berries should be calculated. The final operation is to determine the grade as shown by the calculations on the note sheet and then fill out the memorandum. (12)

Note Sheet. The following is a sample note sheet showing the minimum amount of information necessary to properly determine the grade of a lot of berries, as well as recorded percentages for a lot of blackberries which grades U. S. No. 1. In this note sheet, columns are provided for weights. However, if an even weight in multiples of 100 grams is used for the sample being graded, the weight need not be recorded as the inspector can easily convert the weights in grams to percentages by mental arithmetic. For example, if a 200-gram sample is used, weights of separations need only be halved in order to get the percentage to be recorded. Beams on gram scales may permit reading weights to 1/10 of a gram. However, weights read to the nearest whole gram are sufficiently accurate for inspection purposes. (13)

	Weight of Sample	Red berries		Immature berries		Other Defects		Total Defects
	Grams	Grams	Pct.	Grams	Pct.	Grams	Pct	Pct.
	200	24	12	4	2	14	7	9
	200	16	8	0	0	20	10	10
	200	10	5	2	1	12	6	7
	200	30	15	0	0	10	5	5
	200	20	10	6	3	16	8	11
	200	32	16	0	0	14	7	7
Total	-1200	132	66	12	6	86	43	49
Av. Pct.	- 100		11		1		7	8

(14) Some processors may desire that inspectors keep a record of the types of defects and show them on the memoranda so as to inform growers where their pickers have erred. In such a case, and if time permits, additional columns for defective berries may be added. For example, the following headings on the score sheet would serve this purpose:

Weight of Sample:	Pct. red berries	Pct. Im-mature	Pct. decay: soft, crushed	Pct. shriveled misshapen	Pct. caps: attached	Pct. Other Defects	Pct. total defects

(15) Color. Berries, in order to meet the requirements of U. S. No. 1 grade, must be well colored, which means that at least 85 percent of the berries must have the color characteristic of well ripened berries and not more than 3 percent may have the color of distinctly immature berries. Similarly, U. S. No. 2 berries must have at least 75 percent of the berries with the color characteristic of well ripened berries and not more than 5 percent may have the color of distinctly immature berries. This simply means that in a lot of berries which is characteristically blue or black when well ripened, an average of 85 percent must be blue or black, 12 percent may be red and 3 percent may be light red, whitish or green and the lot will grade U. S. No. 1 as far as color is concerned. Similarly, U. S. No. 2 berries must average 75 percent blue or black berries, and 20 percent may be red and 5 percent may be light red, whitish or green.

(16) If the lot of berries being inspected is characteristically red when well ripened, a lot to grade U. S. No. 1 must average at least 85 percent red berries and would permit 12 percent light red and 3 percent whitish or green berries. A lot of red berries would grade U. S. No. 2 if it averaged 75 percent red berries, 20 percent light red and 5 percent whitish or green berries.

(17) Owing to variations in characteristic color of different kinds and varieties of berries, when well ripened, the inspector must necessarily use some judgment in determining the borderline for the color of distinctly immature berries.

Defects:

(18) Mold, Decay, Crushed, Soft. Unless mycelium is actually present on a berry, it is difficult to tell whether a berry is decayed or not. A berry might have the appearance of being crushed, yet a decay organism may have caused the druplets to break down. Berries which are soft may also be decaying, but from an appearance standpoint it would be difficult to determine whether decay organisms are actually present. Thus, for all practical purposes it is well to score decayed, moldy, crushed and soft berries in one group. The inspector will soon learn to distinguish soft berries by the dead appearance and loss of luster on the druplets. Berries which have more than one-fourth of the druplets crushed should be scored as defective.

Dried, undeveloped and shriveled berries. Occasional berries (19)
will be encountered in the average lot which have some of the druplets dried or undeveloped and which will cause the berry to have a misshapen or shriveled appearance. It is difficult to classify the berry as to the cause for such malformation so, therefore, it is well to group such defective berries together. A berry which has more than one-fourth of the druplets dried or undeveloped should be scored as a grade defect.

Dirt, Other Foreign Matter:

Damage by dirt on berries is ordinarily not an important factor. (20)
However, if berries were picked from bushes growing beside a dusty road they might be dirty enough to fail to classify as to grade. Sometimes pickers get careless and allow an excessive amount of foreign material, such as dead leaves and small twigs to get into the cups. Lots with excessive amounts of such material should not be classified as meeting requirements of either grade. Occasionally, unscripulous growers or pickers place rocks or other such heavy objects in boxes of berries to make them weigh heavier. If lots so doctored are discovered an "unclassified" designation should be given to the lot.

Moisture:

In some wild blackberry regions it has been rather common practice (21)
for some growers to pour water over the crates of berries in order to increase the weight. In one instance in 1946, crates were discovered where the cups had been lined with paper in order to retain more water. Lots of berries so watered should definitely not be classed as meeting the requirements of either grade. Likewise lots which have become excessively wet from rain should be given the designation "unclassified."

Sunscald:

Often some of the druplets on a berry will be injured by sunscald (22)
and have a whitish appearance. Berries which show material damage from such injury should be scored as defective.

Insect Infestation:

The fruit gnat (Drosophilla sp.) more commonly known as the "sour (23)
gnat" or "vinegar gnat" is the most troublesome insect that infests berries. These gnats are small yellowish flies about one-eighth inch in length always found about the refuse of cider mills, decaying fruits, vegetables and fermenting vats of grape juice. The fly lays an egg about 1/25 inch in length. Within a short time the egg hatches into a tiny maggot slightly longer than the egg. The maggot makes a rapid growth and reaches a length of about 1/4 inch. Records show that temperatures of

68° to 77° are best for breeding of the pest. Flies begin laying eggs when 24 hours old and the eggs will hatch in less than 24 hours. The complete life cycle under optimum conditions is only eight days.

(24) Infestation of berries mostly takes place after the druplets of the berries are crushed. The flies are attracted to the exposed juice. As fermentation of the juice develops more of the insects are attracted. Females soon start to deposit eggs which will hatch into larvae in a few hours. Such rapid infestation calls for the utmost care in seeing that berries are handled carefully and that they are processed as soon as possible after picking.

(25) No tolerance is permitted in either U. S. No. 1 or U. S. No. 2 grades for lots of berries infested with worms. It is not intended that the inspector shall make a crushing test of a composite sample of berries to determine the presence or absence of insect larvae. However, he should view with suspicion lots of berries which have been badly crushed or are overripe. He should make a close visual examination of such berries and, of course, if worms are found to be present, the lot should be refused a grade designation and certified as "unclassified."

Other Defects:

(26) Berries are often injured in some manner by hail, birds, or mechanical means. If berries are damaged by such means for processing purposes they should be scored as defective.

INSPECTION MEMORANDUM

(27) After completing the inspection of a lot the inspector should carefully check his notations and calculations on the note sheet and make sure that he has classified the lot correctly. He is then ready to fill out the inspection memorandum, which is the official record of the inspection. No regular inspection memorandum has yet been developed for berries. However, the form FDA-27 used for products such as canning tomatoes, having space for recording U. S. No. 1, U. S. No. 2 and Culls, may be used. There are provided blanks for recording weights and percentages of each grade on these forms. However, these are not applicable to berries so the inspector need only draw lines through the names of the grades not applicable to the lot inspected, extending the lines through the columns headed pounds and percent. For example, if a lot is U. S. No. 1, draw lines through the "U. S. No. 2" and "Culls" designations. If the lot is "Unclassified" a line should be drawn through the word "culls" and the word "Unclassified" substituted.

(28) Memorandum Number. Memoranda are numbered serially and every one should be accounted for. If a memorandum must be discarded because of a mistake, write "void" across the original and each copy and leave them in the pad.

Inspection Point, Processor, Grower, Date and Hour. The name of the inspection point and the name of the processor may be stamped or written on a number of memoranda before the inspection work begins in order to save time. (29)

The grower's name and the date and time of inspection should be filled in at the time of making the inspection. However, there is no objection to dating a number of memoranda at one time provided no more are dated than will be used the same day. (30)

Products Inspected and Number of Containers. Under this heading indicate the name of the product such as "Blackberries," "Boysenberries," etc., in accordance with the facts. The number of containers in the load should be recorded under "Number of Containers." (31)

Remarks. Notations such as principal defects, off-color, etc. may be shown under this heading if requested by the processor. (32)

Signature on Memorandum. The inspector shall sign the memorandum with his name exactly as it appears on his license card. This warning is given because some new inspectors have signed only their initials or simply their last name on the memorandum. Legally, either of these signatures would be worthless. (33)

Distributing Memorandum Copies. The original memorandum is issued to the applicant or party who requests inspection, which is usually the processor; one copy is given to the grower, and another is retained in the pad for office records. (34)

Care of Memoranda. Inspectors should take necessary precautions to prevent blank memoranda from falling into the hands of persons who have no right to use them. No person may lawfully sign them except one who has been duly licensed by a Federal Supervisor. (35)

Each inspector will be held responsible for the return of all unused memoranda to his Supervisor at the close of the season. (36)

During the inspection season, copies of completed memoranda shall be kept in numerical order where they may be made available whenever any financially interested party or Supervising Inspector desires to see them. These shall be sent to the Supervisor at the close of the season. (37)

Results of Inspection Confidential. Inspectors must not divulge information to growers or to competitive processors concerning the results of inspections of individual grower's lots or the general quality of the berries delivered to a plant or assembling station. Statements in which comparisons are made of quality of various growers' lots sometimes prove very embarrassing to the Inspection Service. (38)