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

SHIPPING POINT INSPECTION HANDBOOK

FOR

SNAP BEANS FOR PROCESSING

Washington, D. C.

Revised May, 1960

For Use of U. S. D. A. Fresh Fruit and Vegetable Inspectors

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SNAP BEANS FOR PROCESSING 1/

INTRODUCTION

(1) The preserving of snap beans by canning or freezing is an important phase of the packing industry, and extends into many parts of the United States. A great many States are active in the field, led by Oregon, New York, Wisconsin and California with estimated production ranging from 83,000 to 27,000 tons of beans for processing in 1959. The States of Maryland, Florida, Tennessee, Texas, Pennsylvania, Michigan and Washington are also important bean processing states, each generally producing more than 10,000 tons annually. The total U. S. production for manufacturing purposes in 1959 was placed at 368,700 tons.

(2) Various systems of purchasing snap beans are used by processors. However, the methods used in a majority of cases provide for graduated scales of prices depending upon the percentages of beans of certain grades or sizes or both in the loads.

(3) Generally speaking, beans are canned or frozen in three styles, namely cut beans, French style (shoestring) or whole beans. Cut beans comprise the largest percentage of the pack, with French style pack increasing rapidly in volume. Cut beans may be packed from any size bean but they are usually confined to the 3, 4 and 5 sieve sizes packed separately or in mixtures such as 3s and 4s together or 5s and larger. French style beans are generally made from 5 sieve and larger beans. Only relatively small amounts are packed as whole beans, "asparagus style," generally from sieve sizes 2 and 3 packed separately.

USE OF STANDARDS

(4) The Standards are intended to serve as a basis for purchasing beans for processing, so that a premium is paid for better quality. When growers care for and harvest their crops in such a manner as to deliver higher quality beans, they will enable processors to pack better products which, in all probability, can be sold more readily at higher prices.

(5) Under the graded system of purchasing, there are in general two methods of pricing. One method is to pay a certain price per pound for beans of U. S. No. 1 quality, and a lower price per pound for beans of U. S. No. 2 quality, and nothing for culls. The other method is to base

1/ This supersedes "Snap Beans for Canning or Freezing", issued July 1941 and reissued January 1956.

the price per pound of the entire load of beans on the percentage of U. S. No. 1 quality, as for example, so much per pound for loads 85% or more U. S. No. 1 quality, so much for loads 70 to 84% U. S. No. 1 quality, etc.

GENERAL INSTRUCTIONS TO INSPECTORS

(6) Know the Standards. The inspector shall study the Standards for snap beans and be fully familiar with the principal requirements of the grades. He shall also have a copy of the Standards available at or near the inspection table for reference if and when it is needed to refresh his memory on certain grade requirements.

(7) Processors' Contracts. The terms of the contract and specifications under which the beans are being purchased should be known by the inspector. The contract may contain some special provision relating to size, type (round or flat), or some other factor which will have a bearing on the separations made by the inspector and reported on the certificate.

(8) Use of Handbook. This handbook contains many instructions and grade interpretations which should be helpful to the inspector. In the interest of brevity, the Standards do not contain any procedural instructions, and the definitions do not go into detail. The handbook is intended to supplement the Standards in these respects. The inspector should keep the handbook readily available and refer to it as frequently as needed.

(9) Supplemental Instructions. The inspector may receive special instructions, either oral or written, from his supervisor. He shall observe and follow such instructions implicitly, even though they may appear to conflict with the handbook.

INSPECTION EQUIPMENT

The principal items of equipment are as follows:

(10) Scales which are sensitive within a range of from 1/10 pound to 10 pounds. A second scales is desirable for weighing small quantities of culls, etc. The Triner model 88, one-pound postal scales have been found satisfactory.

(11) Sizer of sheet metal with two or more slots for measuring bean diameter and inch marking for measuring length. Slot widths should be very precise, but the length of the slot is not important. The slot size to separate four and five sieve sizes is 24/64 inches in diameter, and a length of 3 to 4 inches is recommended. A slot 12/64 inch in width with a length of about 1 or 2 inches will serve to determine the minimum size unless otherwise specified. Other size slots may be required, depending upon the contract in force. Sizers must be precision cut and slots made with parallel sides rather than being wedge shaped.

Sample Containers. A dozen clean baskets or hampers which are tight enough so that beans cannot fall out through cracks. (12)

Grading Table about 40 inches high, 2 to 3 feet wide and 4 feet long. A board 2 or 3 inches high across the back and ends of the table will keep the beans from falling off when the inspector is sorting them. Also, two similar boards across the top of the table extending from the back to somewhere near the front will divide the table into three sections to facilitate sorting. (13)

Weighing Container. Some scales are equipped with a scoop which is satisfactory for weighing the beans. If the scales do not have such a scoop, the inspector should obtain a strong basket or box of suitable size which can be used regularly for weighing. (14)

Inspection Certificates especially designed for use with commodities intended for processing. (15)

Slide Rule (optional) especially designed for determining percentages of small samples. If an analysis sample of exactly 10 pounds is used, the slide rule is less essential than if it is of a 2, 3 or 5 pound sample. (16)

SAMPLING

Composite Sample. Owing to the small size of snap beans and the fact that they are to be used in a processing plant, the Standards provide that the grade shall be determined on the basis of a composite sample. Consequently, the samples drawn from individual containers in the load are mixed together to represent the load as a whole. Draw approximately equal quantities of beans from each container sampled. Select containers in all parts of the load for sampling, including some representing all gradations of quality which are seen. In the case of palletized field crates, some samples should be drawn from every crate in the lot. (17)

Sacks, Baskets or Crates. The inspection sample should be drawn by the inspector or by a helper whom he can closely supervise. Draw a handful of beans from the upper portion of the container and another from as deep down in the container as it is possible to reach. Draw from all containers when there are only one to three in the lot, and from a reasonable number if there are more in the lot. When the lot is very large, the number of containers sampled may reasonably drop to 15% or less of the total number. (18)

Palletized Field Crates. Many processors have large palletized field crates or "tote boxes" in which growers load beans to be transported to the processing plant. These crates can hold as much as 700 pounds of beans which are at least three feet deep. They create a serious problem in our efforts to obtain a representative sample. Until some better (19)

method can be devised, the sample will be taken by digging down into the beans to permit drawing several handfuls from about a foot to 18 inches below the surface. Some beans should be drawn from every crate in the lot.

(20) Size of Sample. The size of the sample should be well in excess of the amount to be graded. This will tend to make the sample more representative and avoid the possibility of having insufficient beans for grade analysis. The quantity graded should vary with the size of individual deliveries, which often range from 100 pounds or less to several tons. The analysis sample should not weigh less than one pound under any circumstances. The following table will serve as a guide as to the size of sample which should be analyzed.

LOAD SIZE	SAMPLE DRAWN (Approximately)	ANALYSIS SAMPLE
Under 100 pounds	3 pounds	1 pound
100 - 300 "	5 "	2 "
300 - 800 "	10 "	5 "
800 - 1500 "	15 "	8 "
1500 - 3000 "	20 "	10 "
3000 - pounds up	30 "	10 - 15 "

(21) Identify Sample. The sample must be accompanied by a small slip of paper which amply and correctly identifies it with the lot of origin. Be sure that this cannot fall out or blow away from the sample container.

(22) Restricted Sampling. The Inspection Service policy is to draw unrestricted samples for grade analysis. However, there are circumstances in which this is impracticable. If the applicant wants inspection under such conditions, it should be made clear to him that our inspection and certificate will be restricted to coverage only of the accessible portion of the load.

(23) In the case of palletized crates, the portion inspected might be restricted to the upper 18 inches or upper 15 inches of beans in the crates. In heavily loaded trucks which cannot be inspected during loading or unloading, restriction may be made to containers in upper 3 layers of load or to some other portion of the load. When such restricted sampling is necessary, a statement should be made under "Remarks" somewhat as follows: "Inspection and certificate restricted to beans in upper 18 inches in crates."

TREATMENT OF SAMPLE

(24) Prompt Analysis. Always grade each sample as soon after it is drawn as possible. This will tend to eliminate the question of deterioration of samples. Although it is believed that under favorable conditions beans will not change as rapidly as corn, peas, tomatoes and possibly some other products, they do deteriorate gradually through wilting, drying, toughening and the action of disease. Wilting is more rapid in hot weather and can cause the beans to shrink, thus changing the sieve sizes.

Mixing Sample. The quantity of beans taken for the grading sample should be about twice as large as the amount which will be analyzed. In order to make the analysis sample as representative of the whole sample as possible, the inspector should thoroughly mix the sample before weighing the portion of it for analysis. (25)

Weighing Analysis Sample. In weighing from the whole sample the portion to be analyzed, the quantity weighed should be determined partly with a view toward simplifying the calculation of percentages. Use an "even weighted" sample. If the scales available are calibrated in tenths of pounds or percentage, it will be satisfactory to use a sample of exactly 10 pounds or 8 pounds or 5 pounds, depending upon the size of the lot as outlined in Par. 21. If the scales are calibrated only in ounces, it is recommended that the sample be exactly 200 ounces (12-1/2 pounds) or 100 ounces (6-1/4 pounds) or 50 ounces (3-1/8 pounds). This will permit fairly accurate calculations of percentages, even though the scales are calibrated only in ounces. (See Par. 71). (26)

SIZING

The size of snap beans in terms of diameter is one of the important factors of grade. The inspector must be careful to determine the size accurately. In many locations a size separation is made with a Chisholm Ryder pre-grader unit in order to facilitate the sizing operation. In other locations, all sizing may be done by hand. (27)

Machine Sizing. The Chisholm Ryder pre-grader is a revolving reel type screen which lets the smaller beans pass through and the larger beans tail-out of the end of the reel. The screen size generally in use is the 24/64 inch slot which separates 4-sieve size and smaller from 5-sieve size and larger. Some processors may have different size graders or more than one grader, depending upon the nature of their contracts. (28)

Separating Clusters. The machine cannot accurately size beans held together in clusters by being attached to a piece of vine. The inspector shall pull the beans off the vine as he feeds the sample into the hopper of the pre-grader. The pieces of vine are placed with the extraneous material. (29)

Feeding Pre-Grader. The machine operates more efficiently if it is not crowded. It is better to feed the beans into the hopper gradually rather than to dump a 10-pound sample in at once. Usually the inspector can pull the clusters apart as he feeds the beans into the revolving pre-grader. (30)

Second Run. A few beans which should pass through the screen fail to do so, and they tail-out with the larger beans. The inspector may save time by running the larger beans through the pre-grader a second time to separate more of the beans which should have gone through the screen. (31)

(32) Checking Size by Hand. Machine sizing is known to be somewhat inaccurate, even when the beans are run through the pre-grader more than once. The inspector, therefore, must hand-check a considerable number of beans which appear to be near the size separation line. He will measure them in a 24/64 inch slot or any other size slot corresponding with the machine. There are likely to be a few among the larger size beans which can pass through the slot and which he will place with the smaller beans. As a matter of precaution, the inspector should hand check a few of the largest looking beans in the smaller size lot to make sure that they belong where the machine placed them.

(33) Hand Sizing. Experience has shown that snap beans can be hand sized most effectively if handled individually. There is no advantage in shaking or rubbing them over a large screen with slot openings. Since there is a considerable range in size in most lots, there are usually relatively few which are close in size to the separation line.

(34) Sort by Eye. The inspector very soon acquires the ability to do most of the size separating by eye, leaving only relatively few beans which he needs actually to measure. The beans which are obviously larger in diameter or obviously smaller in diameter than the line of separation are put in their respective places without measuring. Each bean is examined for shape, defects and maturity as it is placed for size, so that the need for a second sorting is avoided. Every bean shall be rapidly turned over in the hand in order to permit examination of both sides for defects.

(35) Measuring in Slot. The bean which goes through the slot scarcely touching the sides is smaller than the slot size. If the bean firmly touches the sides of the slot, it is considered larger than the slot opening and goes into the group of larger beans. The grade says, for example, "to, but not including 24/64 inch."

(36) Most so-called round beans are not actually round in cross section. A bean is usually a little larger in diameter measured in one direction than in another. When a bean is size tested, it may start to pass through the slot freely and then reach a point where it firmly touches the sides of the slot. Frequently, by turning the bean slightly, we can expose a smaller diameter and allow the bean to continue passing through the slot. The inspector must determine whether the bean can pass freely through the opening, even if it requires turning to find its smallest diameter at a given point.

(37) Measuring Undersize. The minimum diameter of beans permitted in either U. S. No. 1 or U. S. No. 2 grade is 12/64 inch, unless otherwise specified. Any bean which will pass freely through this (or some other specified minimum size) slot is classed as undersize. It may be necessary to turn or rotate the bean in the slot to determine whether it can pass through. Undersize beans are considered too small to be salvaged in the plant, and are classed as culls. If any portion of the bean will not pass freely through the slot, it should not be classed as undersize.

SORTING FOR DEFECTS

(38) The beans should be graded for quality at the same time they are being sorted for size. As each bean is handled to be placed for size, it is turned over in the hand and examined for shape and defects. Grade factors to be observed are varietal type, shape, scars, other blemishes and maturity or tenderness.

(39) Varietal Type. Mixtures of varieties are uncommon in growers' loads. If varieties are similar in appearance, a mixture is not very objectionable. However, if definitely different types are mixed, they can create an objectionable appearance in the finished product. The grade definitions are quite explicit on dealing with mixtures of types, but explanation may be helpful.

Example: A lot of round green beans contains a few semi-flat type green, a few flat type green, and a few wax (yellow) beans. The semi-flat green beans are not permitted in U. S. No. 1 mixed with round green type, but are permitted in U. S. No. 2 grade. Both the flat green beans and the wax beans are types extremely different from the round green, neither being permitted mixed with round green in the U. S. No. 2 grade, so they are placed with the culls.

(40) Shape. The requirements of U. S. No. 1 and U. S. No. 2 for shape are defined in the Standards and also illustrated by profile drawings. The inspector should have the limitations of shape well fixed in his mind so that he can decide without hesitation into which group the bean can go. However, he should refer to the shape drawings occasionally to keep his sights in line.

(41) Wilting. The standards require the beans to be "fresh" in both U. S. No. 1 and U. S. No. 2 grades. The term fresh is defined as meaning not more than slightly wilted. Many smaller beans become slightly wilted in the field and on the truck during the process of harvesting and hauling. This slight wilting is normal and does not materially affect the processing quality. If the bean is badly wilted, it will be very flabby and may be somewhat shriveled and wrinkled. Such beans should be classed as culls.

(42) Scars. The scoring of scars requires careful judgment on the part of the inspector. Size, color, roughness and location of the scar on the bean must all be taken into consideration. These characteristics have direct bearing on how much effect the scar will have on the appearance of the bean in the finished product. Each individual bean must be judged on its own merits, but the inspector may be aided in making his decision by the following:

1. Small scars located at the extreme tip end or stem end are practically all removed in the usual snipping operation, and may be disregarded.

2. Inconspicuous, smooth, light colored scars which will blend in color with the rest of the bean when blanched and will scarcely be noticeable on the processed product, may be permitted in U.S. No. 1 grade.

3. Moderately unsightly scars which will probably affect only one cut section of the bean may be permitted in U. S. No. 2 grade.

4. Moderately unsightly scars which will probably affect two or more cut sections of the bean shall cause the bean to be classed as a Cull.

5. Very unsightly or very dark scars, even though affecting only one cut section of the bean, shall cause the bean to be classed as a Cull.

(43) Clusters. The term "cluster" applies to two or more snap beans attached to the same piece of vine. There usually are very few clusters in hand picked beans, but they are fairly common in machine picked beans. Although somewhat objectionable to the processor, clusters are a natural factor in mechanized harvesting operations, and they are not barred from either U. S. No. 1 or U. S. No. 2 grade. In sorting the sample, clusters should be pulled apart, each bean graded on its own merits, and the detached portion of vine placed with the extraneous material.

(44) Rust. A fungus disease known as rust sometimes attacks a field of beans. It is more likely to appear late in the Summer or early Fall, especially if there has been abundant rainfall. The disease is more inclined to affect the foliage, but may occasionally show up on the bean pods as brown or tan spots somewhere near one-eighth inch in diameter. The inspector should use the same general principles applied to scars in deciding how to score beans affected by rust.

(45) A physiological disease known as Russet is easily confused with rust. It shows up as watersoaked or tan colored streaks and flecks, usually in a somewhat diagonal pattern following the vascular bundles on the sides of the pod. It is rarely seen on fresh beans but may appear on beans which have been stored for a while or have been shipped long distances. Wax varieties seem to be more susceptible to russet than green varieties. Affected beans should be handled in grading on the same basis as scars.

(46) Insects. The injuries caused by insects should be scored on much the same basis as outlined for scars. Older insect injury will be in the form of healed scars, but usually they are more unsightly in appearance or deeper and more penetrating than wind scars, and are likely to fall into the Cull Classification. The presence of an open hole or an insect in the bean automatically makes the bean a Cull.

(47) Broken Ends. If the broken end is near what was originally the stem end or the tip end, and the bean is tapered to a small diameter at that point, the break should be ignored. The term "thick portion of the bean" means any place in the length of the bean except where it is tapered down to a smaller diameter at either end. The drawings attached to the Standards should be helpful in interpreting this definition.

If the tissue of the broken end has developed distinctly brownish discoloration or has dirt ground into it which will not wash off, the blemish shall be considered serious damage and the bean shall be classed as a Cull. A waterscaked appearance or a light tannish discoloration of the broken end will not materially affect its appearance, and shall be permitted in U. S. No. 2 grade. Likewise, broken ends which have picked up a light coating of dust or lint which can be removed readily in the blanching and washing operations shall be permitted in U. S. No. 2. (48)

Bruises. Mechanically harvested beans may show small bruises. Most of them are insignificant and if processed without long delay, will not be noticeable after blanching. Bruises where the flesh has been made soft or distinctly discolored, should be scored as damage when the largest dimension of the individual bruise exceeds 1/4 inch; or scored as serious damage when one or the aggregate of several such bruises exceeds 3/4 inch in length. (49)

Punctures. A bean shall be scored as damaged if it has a puncture or cut in the bean wall more than 1/4 inch long. If the puncture or cut is badly discolored or distinctly dirty, it shall be scored as serious damage. Also score as serious damage a bean which has one cut more than 3/4 inch or several cuts aggregating more than 3/4 inch long. (50)

Decay. All types of decay are barred from both U. S. No. 1 and U. S. No. 2 grades. This includes such soft rots as Soil Rot and Gray Mold Rot as well as Anthracnose, even though the affected area may be small. Rust and russet are not classed as decay. (51)

Maturity. Grading beans on the basis of maturity, tenderness and succulence is one of the more difficult determinations the inspector has to make. The definitions of the terms "tender," "succulent," "firm" and "tough or overmature" should be very helpful. The bean must be firm, succulent and tender to meet the requirements of U. S. No. 1 grade, which means that it must be in the prime edible stage for a snap bean. To be permitted in U. S. No. 2, it must be firm and must not have reached the stage of being tough or overmature, which means that it is still in a fairly good eating stage. Processors may contract on the basis of maturity as indicated by testing composite samples of beans in some sort of a machine for measuring tenderness. (52)

Breaking Beans. The inspector should, as a matter of course, break an occasional bean as he grades the sample. By starting with one of the older looking beans in the sample, he is likely to discover whether the lot has any tendency toward overmaturity or dryness. If the older beans do not meet the grade requirements for maturity, it is necessary to break beans of a somewhat younger appearance. The number and size of the beans broken will vary considerably with the quality of the lot being graded. The inspector should not hesitate to break as many beans as he feels are needed for examination to determine maturity. (53)

(54) Beans should be broken at about the mid-point of their length by bending the ends around until the bean snaps. The ease and cleanness with which the bean snaps are good indications of its maturity and condition, but the appearance of bean tissue exposed at the broken ends is even more important. In case the bean appears to be very close to the line on maturity, breaking it at one or two other places may help you to make a decision on how to grade it.

*(55) Cutting Beans. A longitudinal cross-section of the bean permits an examination of the internal quality of the entire bean at one glance. At the discretion of the inspector, depending on variety and growing season, the bean can be split open either by cutting it from stem to tip end halfway between the seams or on the seams whichever method permits a fast and easy determination of internal quality (dryness, open spaces, etc.) Classify the cut bean on the basis of most of its length, even though one-third or less of it may appear to be one class higher or lower than the rest.

(56) Succulence. The flesh of a tender bean, when exposed by breaking, should have a succulent appearance. That is, it should look watersoaked and glassy rather than dry and pithy. The extreme outer rim of the broken surface will normally be more opaque in appearance, as it forms the protective outer coating of the bean. The jelly-like tissue inside the bean may be less watersoaked in appearance close to the seed, but it should not show more than a slight dryness or grayish color if the bean is to be permitted in U. S. No. 1.

(57) Beans showing conspicuous internal drying and graying of the tissues shall be placed in the U. S. No. 2 grade, because they are not considered succulent. This condition may or may not be associated with development of fiber, but in either case the bean shall be excluded from No. 1 grade.

(58) Beans in the more advanced stages of dryness are considered tough or overmature and are classed as Culls, even though they may be small and may appear not to be old. The flesh of such beans has very little or no succulent tissue and has become mostly pithy or whitish-gray in appearance and frequently has definitely noticeable air pockets around the seeds.

(59) Internal Open Spaces. Occasionally some lots of beans develop open interlocular spaces or "air pockets" between the seeds inside of the pod. These spaces vary greatly in size in relation to the diameter of the pod. The tissue surrounding the spaces may be firm and succulent, but it is more likely to show evidence of dryness in the form of turning gray or white and becoming pithy. In judging the bean for succulence, the open spaces should be ignored if the flesh around them is succulent and normal in appearance. However, if the flesh shows the characteristics of developing dryness, the bean should be handled as instructed in the foregoing paragraphs. (Paragraphs 56-58).

Tenderness. The tenderness of the bean depends to a large extent on the amount of fibrous tissue in the walls of the pod. If the bean is fresh and turgid, the way it snaps may give an indication of the fiber content. If it snaps easily and breaks cleanly, there is probably little or no fiber present. Wilted beans do not snap readily, but this should not be taken as an indication that they are not tender. (60)

After the bean has been broken or "snapped," the exposed ends should be examined for fiber or strings as well as for succulence. The ideal stage of maturity is that in which there is a clean break with practically no trace of fibers or strings. If there are only small hair-like fibers protruding very slightly, the bean should be considered tender. If there are a number of ragged, spiny edges caused by protruding ends of fiber or strings, the bean should be placed in the U. S. No. 2 grade. If the bean breaks with difficulty and the fiber is heavy, causing long protruding fibers or strings or "sharks' teeth," the bean should be classed as tough or overmature and scored as a Cull. (61)

Tenderness and succulence are usually closely related, and the bean is judged for maturity on the basis of both. However, there may be occasions when the decision will hinge on either one factor or the other. (62)

Seed Size. The size of the seed is not mentioned in the Standards, and is not a grade factor. However, seed size is usually one of the visible features of the bean which may be roughly indicative of its stage of maturity. The inspector should be alert to watch for enlarged seeds which may be accompanied by objectionable conditions such as fiber, dryness, or both. Never score a bean as a U. S. No. 2 or Cull solely on the basis of enlarged seeds. If it is scored for maturity in one of these categories, the decision must be based on fiber or dryness of the pod. (63)

Varieties of snap beans differ widely in seed characteristics, especially seed size. In some varieties the seed is much larger than in other varieties at comparable stages of maturity. The inspector will soon learn to make allowances for these varietal differences, keeping in mind that we grade the bean for maturity entirely on the basis of its tenderness and succulence. (64)

Mechanical Tests. Processors may wish to have tenderness of their snap beans determined on the basis of a mechanical device such as the "Shear Press." This might be done as a basis for grading and pricing to the grower or simply for the information of the factory personnel. If requested to sample and grade loads of beans on the basis of one of these devices, the Inspection Service will do so, provided that the processor furnishes the necessary equipment and the method is covered in any existing contracts with the growers. (65)

(66) Culls. Individual beans which do not qualify for U. S. No. 1 grade may meet the requirements for U. S. No. 2 grade. Those which fail to meet U. S. No. 2 grade are automatically classed as "Culls" by definition of the Standards. A bean smaller than the 12/64 inch minimum diameter specified in the Standards (or any other minimum size specified by the contract) is a Cull. A bean shall not be classed as a Cull because of very large diameter since there is no maximum diameter in the U. S. No. 2 grade.

(67) Extraneous Material. Everything in a lot of beans, other than the snap beans themselves, is classed as extraneous material. This includes all portions of the bean plant which may be in the lot. Any vines or leaves found attached to the beans shall be separated from the beans by hand in the process of grading the sample. The quantity of extraneous material sometimes runs high in mechanically harvested beans, due to such factors as wet weather, lodged bean vines and method of operating the picker.

(68) Some contracts may set limitations on the quantities of such material in the load which will be accepted, even though it is the general practice to pay nothing for either culls or extraneous material. The inspector will merely report the percentages of these two categories present without making reference to any contract specifications.

(69) Dirt. The Standards do not mention dirt, excepting the "loose dirt" included under extraneous material. It is the intent of the Standards that any dust, mud, caked dirt or other adhering material on the beans will be permitted, so long as there is reasonable certainty that it will be removed in the usual factory processes of washing, blanching, etc. Mechanically harvested beans frequently show mud smears or are dust coated, due to the way the machine handles them, and even hand-picked beans may be dirty at times. This dirt is usually removed without any trouble during the processing, and the weight involved is relatively unimportant.

(70) If some sort of dirt or other foreign material is attached to the bean so firmly that it will not wash off in the factory processing, it should be considered as "materially affecting" or "seriously affecting" the processing quality, as the case may be, and the bean should be scored as a No. 2 or a Cull. A typical example of this is a bean which has picked up a smear of blackened oil or grease from the picker.

WEIGHING SORTED MATERIAL

(71) Weighing the several lots of material sorted out in grading the sample requires care, because some of them, such as Culls or extraneous material, usually occur in small quantities. A Model 68, one-pound capacity Triner scale is very useful for this purpose and is recommended. This type of scale is fairly sensitive in weighing small quantities. (See Par. 26).

CALCULATING PERCENTAGES

A slide rule or percentage calculation table will be very helpful in calculating percentages. In cases where pounds and ounces are the units of weight measurement and the scales are not calibrated in decimal portions of pounds or percentages, the inspector should convert all weights to ounces in order to simplify the calculations. (See Par. 26). (72)

CERTIFICATE

A special form of certificate prepared for use with processing crops is required, and preferably it should be one designed especially for use with snap beans. It should provide the spaces for date, hour, name of processor, grower's name and address, weight of sample analyzed, type beans, weight of U. S. No. 1, U. S. No. 2, Culls and Extraneous Material and the percentage of each, and a blank space for any additional category which the contract might include. There should also be a line for the total of the weights and the total of the percentages. Next to this is the standard form statement and a place for the inspector's signature, and it is recommended that there be a space for "Remarks." (73)

The lower one-third to one-half of the certificate form should be separated from the rest and adapted for information which will be obtained and recorded by the processor or buyer. This includes load weights, counts, price calculations, etc.; all of which are not the responsibility of the inspector. (74)

Recommended Certificate Form. The following is a sample of the certificate recommended for snap beans for processing. It is customarty to print the statement at the top of the certificate and the statement above the inspector's signature in small type to conserve space. (75)

UNITED STATES DEPARTMENT OF AGRICULTURE

_____ Dept. of Agriculture No._____

SNAP BEAN INSPECTION CERTIFICATE

This certificate is issued in compliance with the regulation of the Secretary of Agriculture governing the inspection of various products pursuant to the Agricultural Marketing Act of 1946, as amended (7 U.S.C. 1621 et seq.), and is admissable as prima facie evidence in all courts of the United States. WARNING: Any person who knowingly shall falsify, make, issue, alter, forge or counterfeit this certificate, or participate in any of such actions, is subject to a fine of not more than $1,000 or imprisonment for not more than one year, or both.

DATE_____ HOUR_____ SAMPLE WT_____ VARIETY OR TYPE_____

GROWER_____

_____

PROCESSOR_____

I, the undersigned, on the date above specified made personal inspection of samples of the lot of products herein described, and do hereby certify that the quality and/or condition, at the said time and on said date, pertaining to such products, as shown by said samples, were as stated below:

Grade	Pounds in Sample	Percent
U. S. No. 1		
U. S. No. 2		
Culls		
Extraneous Material		
TOTAL		

REMARKS_____

_____

_____

_____

_____ Inspector

The information below is for the Processor and is not certified by the inspector.

No. Containers _____

		No. 1	No. 2		Total
lbs. Gross					
lbs. Tare	lbs.				
lbs. Net	¢				
_____ Weigher.	$				

Numbering. It is preferable that the certificates be serially numbered when printed, so that each original and its copies bear the same number. However, this is not mandatory, and the inspector may number each one as he fills it out, giving them consecutive numbers in the space provided in the top corner. (76)

Copies. The certificate is made out with at least two carbon copies. This system provides one for the processor (top copy), one for the grower, and one to be retained by the Inspection Service. In some cases, the processor wants more than one copy for his own purposes, in which case he shall make necessary arrangements with the Supervisor in advance of the deal. (77)

Signature. The certificate must be signed by the person or persons making the inspection. He must write his full name or his last name with the initial of his first name and his middle name. Initials alone or nicknames must not be used for signatures, as they are not recognized legally. (78)

Corrections. Minor mistakes on certificates may be corrected, if they are such as not to affect the creditability of the certificate. Do not erase a mistake, but cross off the error and write the correction immediately above or below it. The inspector should add his initials as close as possible to the correction, to show that he has made the change. No change should be made unless all copies are present and can be changed at one time. (79)

Voiding. When errors in weights or percentages have been made which would materially affect the grade and price, the certificate and its copies should be marked "VOID" across their faces, and all copies kept in the file maintained by the Service. A new, correct certificate shall be issued in its place, with no reference to the first certificate. (80)

If an error is discovered on a certificate and all copies are not available, the inspector shall mark the copy or copies he has "VOID" and retain them in his file. He shall then issue a correct certificate, and on it he shall write: "This certificate supersedes Certificate No._____." (81)

Care of Certificates. The Inspector has four general types of responsibility for the certificate as follows: (82)

1. Be sure that he has an ample supply of certificate forms at the beginning of the deal and throughout the deal. He should notify the supervisor several days in advance of the time he estimates his supply might be exhausted.

2. Keep his file of certificate copies in proper numerical order in a place where they are safe from physical damage and from anyone tampering with them.

3. Keep his supply of blank certificate forms where they are reasonably safe from use by unauthorized persons.

4. Turn over to the Supervisor as requested, all files of copies of issued certificates, and at the end of the deal turn in all supplies of unused certificate forms, unless the latter are printed by the processor at his own expense.

(83) Processor Printed Certificates. If the processor wishes to pay for the printing of the certificates to be used by Federal-State inspectors, he may do so, provided the portion of the form which the inspector will use meets with the approval of the Washington office in advance of the printing. Some processors prefer to do this in order to provide spaces for their own records at the bottom of the certificate form. In such cases, the Federal or State Supervisor should submit a rough draft of the proposed form to Washington for approval at a date sufficiently early to permit the printing to be done before the deal begins.

FIELD INSPECTION

(84) Purpose. Some processors prefer to have the beans graded in the field rather than at the time of delivery to the plant. The chief purpose is to obtain a fairly accurate determination of the stage of maturity of the beans in the field. Advance knowledge of the stage of maturity of the various fields of beans being grown for him under contract enables the processor to order each individual field to be harvested at the approximate time when it reaches its maximum potential quality for his use.

(85) Usually the processor's field man arranges an appointment with the grower to inspect a certain field of beans. When the inspector arrives, the grower may have already picked a sample from the field for the inspector's examination. The inspector may run a grade on this sample if so requested, but he should also obtain and grade a sample of his own from the field. In that case, the grade of the two samples should be averaged to obtain the grade to be reported for the field.

(86) Picking Sample. The inspector, either alone or with a company field man, walks across the field taking handfuls of beans at regular intervals and varying his direction as needed to get as nearly representative sampling as possible. He should get some of his sample from many parts of the field, taking pains to see that he gets proportionate amounts from higher or lower ground and from more fertile and less fertile portions of the field. The sample picked should be large in order to insure proper representation.

(87) Analysis of the Sample is usually made on the spot. The inspector should take his sample containers, scales, sieving gauges, certificates, etc. in the car with him. The analysis will be made on the basis of the Standards or whatever other specifications may be provided in the grower's contract.

Reporting. The inspector should report his grade findings to the interested parties, but he should leave the matter of ordering the harvesting of the beans to the field man or someone in the plant office. In some cases, certificates may not be used to report the results of these inspections. The inspector should at least make a written report of his findings and retain a carbon copy for the Inspection Service. (88)

REINSPECTION

In a great majority of cases, one carefully made inspection will be sufficient to establish the approximate grade of a load of beans to the satisfaction of both parties. However, there may be occasions when a second inspection will be requested. If the request is reasonable and the circumstances justify it, the second inspection shall be made. (89)

Held-Over Loads. If a load has been held for some length of time, the processor may need another inspection to give him up-to-date information on the condition of the beans. In such cases, the certificate should be issued without reference to the inspection made a day or so earlier. (90)

Question of Sample. When either the grower or the processor requests another inspection because he feels that the sample obtained was not representative of the load, the inspector should give the request sympathetic consideration. If the beans are still available and the appearance of the lot indicates the possibility that the sample graded did not truly represent the load, another sample should be drawn. Special pains should be taken to get as representative a sample as possible. The result of the analysis of the first and second samples shall then be averaged and reported as the grade of the lot. (91)

Restricted Inspection Loads. A restricted inspection report may be challenged when unloading begins if the plant men see some inferior looking stock in what was formerly an inaccessible portion of the load. In such cases, the lot should be completely sampled by unloading the truck or by dumping pallet field crates. The resulting unrestricted sample should be analyzed and graded. Finally, the results of this inspection shall be averaged with those of the original inspection, and the average grade reported on a new certificate. Under "Remarks," a statement should be shown somewhat as follows: "This certificate supersedes Certificate No._____." (92)

Transported Loads. In some cases, large truck loads of beans may be transported long distances from a growing area to a processing plant. They may be inspected when they are loaded and inspected again as they are unloaded, possibly in another State. The inspection at the receiving point shall be made thoroughly and carefully, but the certificate should be issued without reference to a previous inspection unless an appeal inspection has been requested. (93)

(94) Appeal Inspection. An appeal inspection may be requested at the location of the original inspection because the grade interpretation of the inspector is contested. In that case, the Supervising Inspector or the Federal Supervisor shall be called in to make the inspection. He shall resample the load, obtaining as representative a sample as possible, and shall analyze a quantity twice as large as is customarily used. The results of this analysis shall be the final grade for the lot.

(95) If an appeal is requested on a load coming from another State, the inspection should be made either by two inspectors jointly or by the Supervisor. Unless the load has traveled in a public carrier and can be assumed to have retained its identity, there is no sound basis for an appeal inspection. If the findings of an appeal inspection are in material conflict with those of the previous inspection in another State, the Supervisor should refer the facts of the findings to Washington and await instructions on how to handle the report. The Supervisor in the State of origin and financially interested parties should be notified promptly of the results of an appeal inspection.

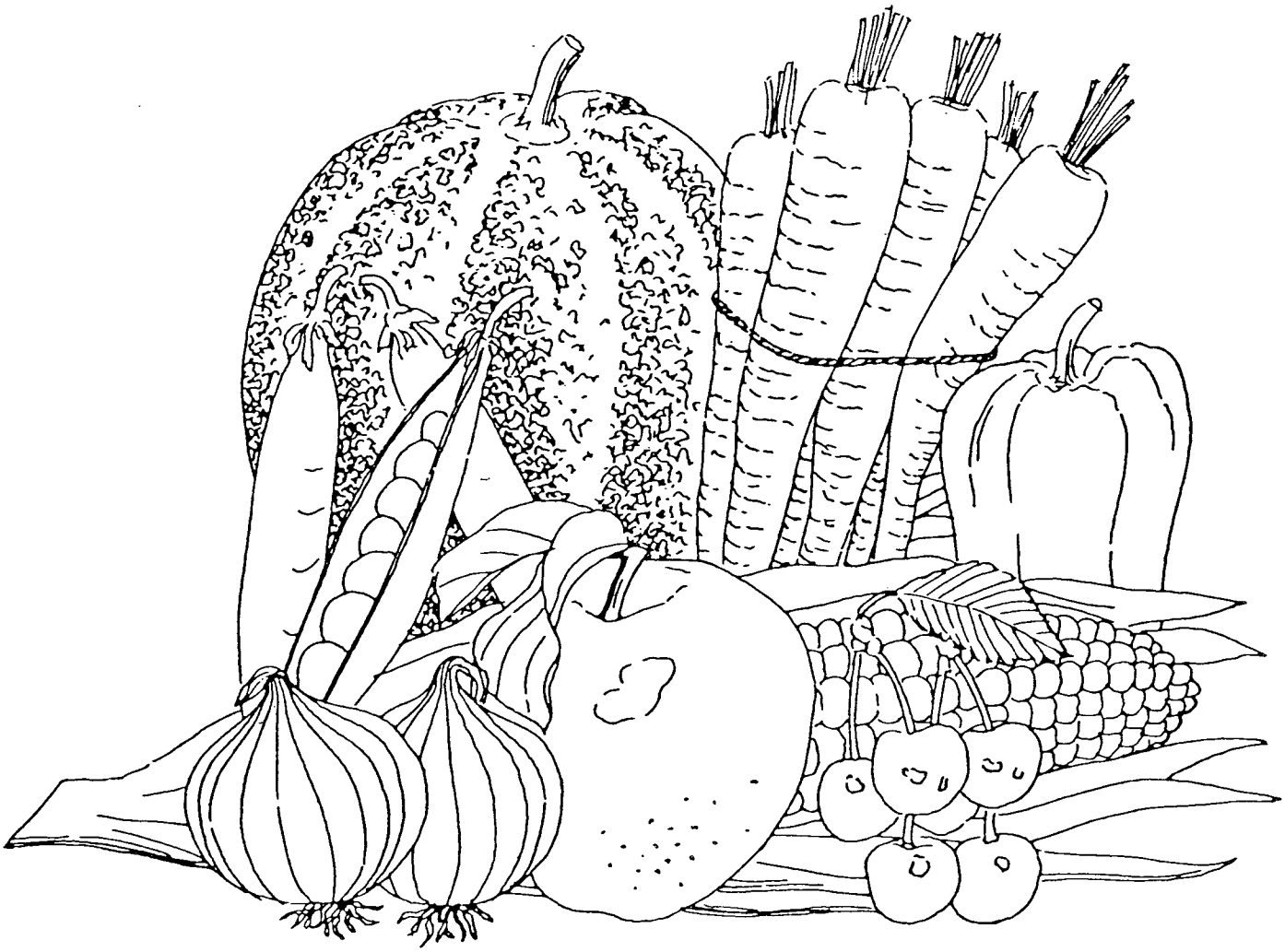
(96) Condition Factors in Appeals. The quality of snap beans may change fairly rapidly under unfavorable conditions such as exposure to heat, dry wind or excessive moisture. Factors of quality most likely to develop or increase during transit or storage are decay, wilting, russet, and discoloration caused by oxidation of broken ends, punctures and bruises.

(97) When making an appeal inspection, separate percentages should be determined for each factor scored which may have made its appearance or increased since the first inspection. These percentages should be included in the information supplied to the Washington office if and when you request authorization to reverse the grade, as they may have a direct bearing on the decision to be reached. Wilting affecting many beans in the lot, even though generally not sufficient to score individual beans as damaged, should be reported as it may have caused some lessening of the diameter size of the beans.

* * * * * *

Appendix I

United States Standards



UNITED STATES STANDARDS FOR GRADES OF SNAP BEANS FOR PROCESSING [1]

SOURCE: 24 FR 5684, July 15, 1959, unless otherwise noted. Redesignated at 42 FR 32514, June 27, 1977 and at 46 FR 63203, Dec. 31, 1981.

Effective July 26, 1959

GRADES

CULLS

SIZE CLASSIFICATIONS

APPLICATION OF STANDARDS

DEFINITIONS

AUTHORITY: §§ 51.3240 to 51.3258 issued under secs. 202–208, 60 Stat. 1087, as amended; 7 U.S.C. 1621–1627.

GRADES

§ 51.3240 U.S. No. 1.

"U.S. No. 1" consists of snap beans of similar varietal characteristics which are fresh, firm, succulent, tender, fairly well formed, free from decay, anthracnose and extraneous material, and free from damage caused by scars, rust, other disease, insects, bruises, punctures, broken ends or other means.

(a) Unless a larger diameter is specified, the maximum diameter of beans in this grade shall be less than 24/64 of an inch (maximum diameter of 4 sieve size).

(b) Unless otherwise specified, the minimum diameter of beans in this grade shall be 12/64 of an inch.

§ 51.3241 U.S. No. 2.

"U.S. No. 2" consists of snap beans of similar color and reasonably similar type which are fresh, firm, not tough or overmature, not seriously misshapen, and which are free from decay, anthracnose and extraneous material, and free from serious damage caused by scars, rust, other disease, insects, bruises, punctures, broken ends or other means.

(a) There shall be no maximum diameter in this grade.

(b) Unless otherwise specified, the minimum diameter of beans in this grade shall be 12/64 of an inch.

CULLS

§ 51.3242 Culls.

"Culls" consists of beans which do not meet the requirements of U.S. No. 2 grade.

SIZE CLASSIFICATIONS

§ 51.3243 Size classifications.

Size classifications have been established by the industry to describe different sizes of beans. If size is specified, it is recommended that one or more of the following designations be used:

Sieve size:	*Diameter*
No. 1	12/64 to, but not including, 14.5/64 inch.
No. 2	14.5/64 to, but not including, 18.5/64 inch.
No. 3	18.5/64 to, but not including, 21/64 inch.
No. 4	21/64 to, but not including, 24/64 inch.
No. 5	24/64 to, but not including, 27/64 inch.
No. 6 and larger	27/64 inch and larger.

APPLICATION OF STANDARDS

§ 51.3244 Application of standards.

In determining the grade of a lot of beans, representative samples are drawn from various parts of the lot and mixed together. The composite sample or a portion thereof is sorted into U.S. No. 1 grade, U.S. No. 2 grade, culls and ex-

[1] Packing of the product in conformity with the requirements of these standards shall not excuse failure to comply with the provisions

by weight, of each is determined. Under this system, tolerances for beans below grade or for extraneous material are not required in the standards.

DEFINITIONS

§ 51.3245 Similar varietal characteristics.

"Similar varietal characteristics" means that the beans are of the same general type and color. Wax type shall not be mixed with green type, and round, semi-flat and flat types shall not be mixed.

§ 51.3246 Fresh.

"Fresh" means that the bean is not more than slightly wilted.

§ 51.3247 Firm.

"Firm" means that the walls of the bean are reasonably solid, not puffy or spongy.

§ 51.3248 Succulent.

"Succulent" means that the flesh inside of the walls of the bean is translucent and juicy with not more than a slight trace of drying around the seed.

§ 51.3249 Tender.

"Tender" means that the bean is practically free from fiber or strings.

§ 51.3250 Fairly well formed.

"Fairly well formed" means that the bean is not more than moderately curved, crooked, twisted or tapered.

§ 51.3251 Extraneous material.

"Extraneous material" consists of bean vines and leaves, weeds, stones, sticks, loose dirt or other foreign material. All vines attached to beans shall be detached in determining the grade and included with the extraneous material.

§ 51.3252 Damage.

"Damage", unless otherwise specifically defined in this section, means any defect which materially affects the processing quality of the bean. Any one of the following defects, or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:

(a) Scar, rust or other disease spot which will be plainly noticeable after the bean has been blanched;

(b) Bruises or punctures which are noticeably discolored, or which affect an area more than one-fourth inch in

(c) Broken ends when the flesh of the thick portion of the bean is exposed, or when the remaining portion of the bean is less than 2¼ inches long; and,

(d) Insect stings or scars which will be plainly noticeable after the bean has been blanched.

§ 51.3253 Diameter.

"Diameter" means thickness as determined by the width of the smallest slot through which the bean may be passed, without forcing, in any one position or series of positions.

§ 51.3254 Similar color.

"Similar color" means that the bean is of the same color type as the majority of the beans in the lot. Wax type beans in a lot of green beans shall be classed as culls, and green type beans in a lot of wax beans shall be classed as culls.

§ 51.3255 Reasonably similar type.

"Reasonably similar type" means that the beans are not distinctly different in cross-section shape. For example, round and semi-flat beans shall be considered reasonably similar; and flat and semi-flat beans shall be considered reasonably similar. Round and flat beans shall not be considered reasonably similar types.

§ 51.3256 Tough or overmature.

"Tough or overmature" means that the bean is leathery, fibrous and stringy or has dry, whitish, pithy tissue or air pockets around the seeds.

§ 51.3257 Seriously misshapen.

"Seriously misshapen" means that the bean is badly curved, crooked, twisted or tapered.

§ 51.3258 Serious damage.

"Serious damage", unless otherwise specifically defined in this section, means any defect which seriously affects the processing quality of the bean. Any one of the following defects, or any combination of defects the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as serious damage:

(a) Scars, rust or disease spots which are very dark colored or very unsightly, or which are moderately dark and moderately unsightly and affect more than one-fourth the length of the bean;

(b) Bruises or punctures which are badly discolored, or which affect an area more than three-fourths inch in length;

(c) Broken ends which expose the

one end is broken and the exposed flesh is distinctly discolored, or when the remaining portion of the bean is less than 2¼ inches long; and,

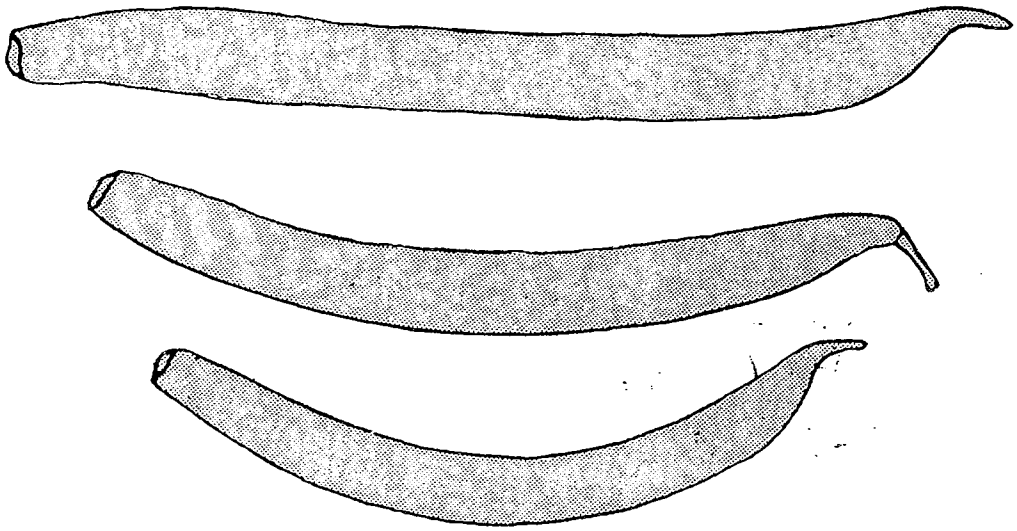
(d) Insects which are present inside the bean, or any insect hole penetrating the wall of the bean, or very unsightly insect stings or scars.

The United States Standards for Snap Beans for Processing contained in this subpart shall become effective 10 days after publication hereof in the FEDERAL REGISTER, and will thereupon supersede the United States Standards for Snap Beans for Processing which have been in effect since March 1, 1940.

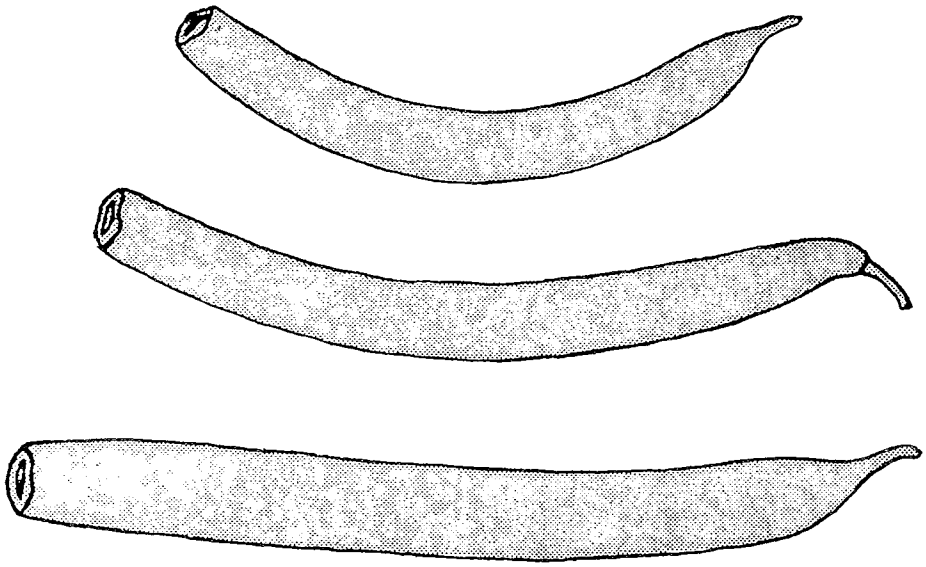
Dated: July 10, 1959

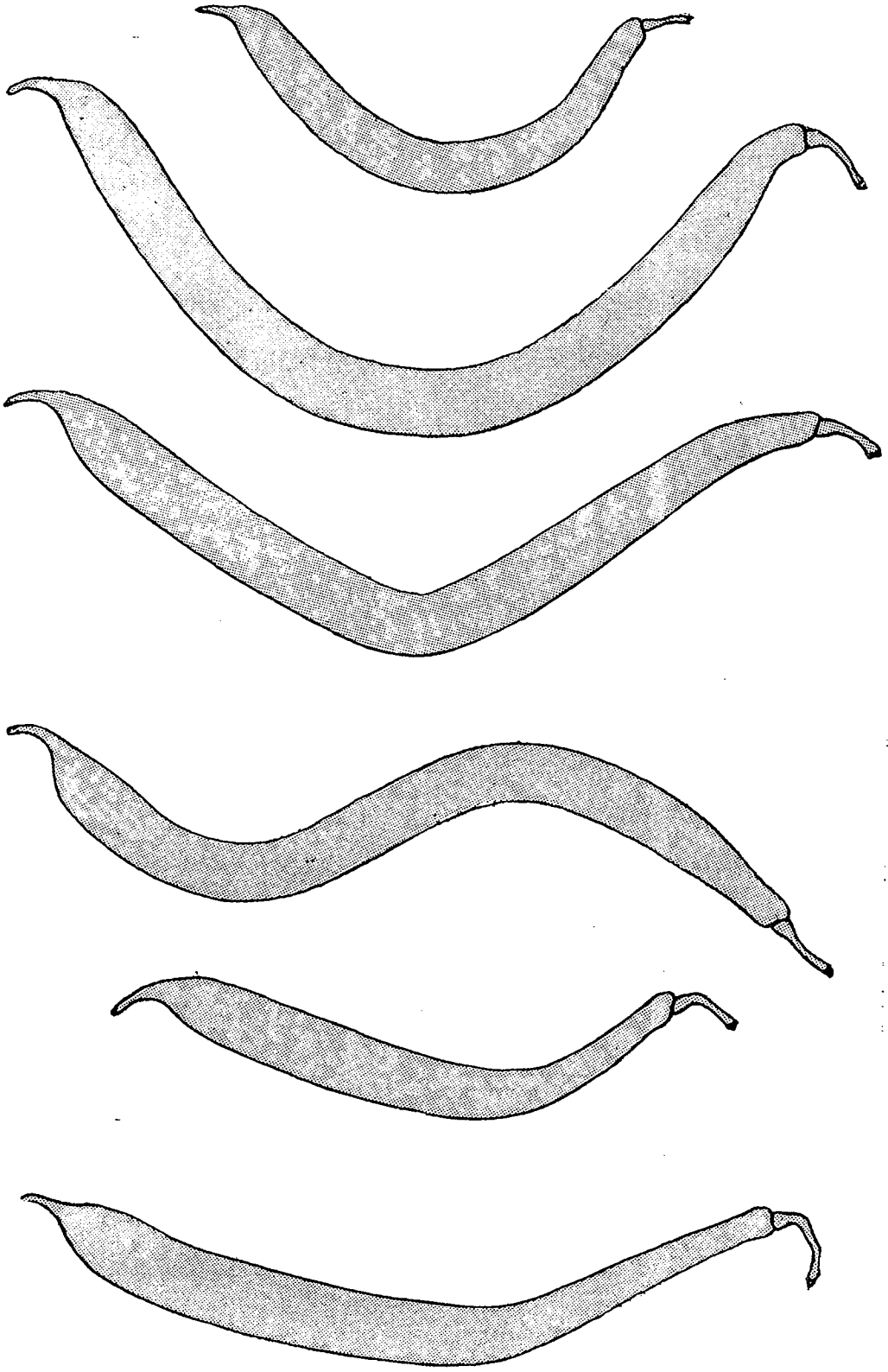
ROY W. LENNARTSON,
Deputy Administrator,
Marketing Services.

[F.R. Doc. 59-5835; Filed, July 14, 1959; 8:47 a.m.]

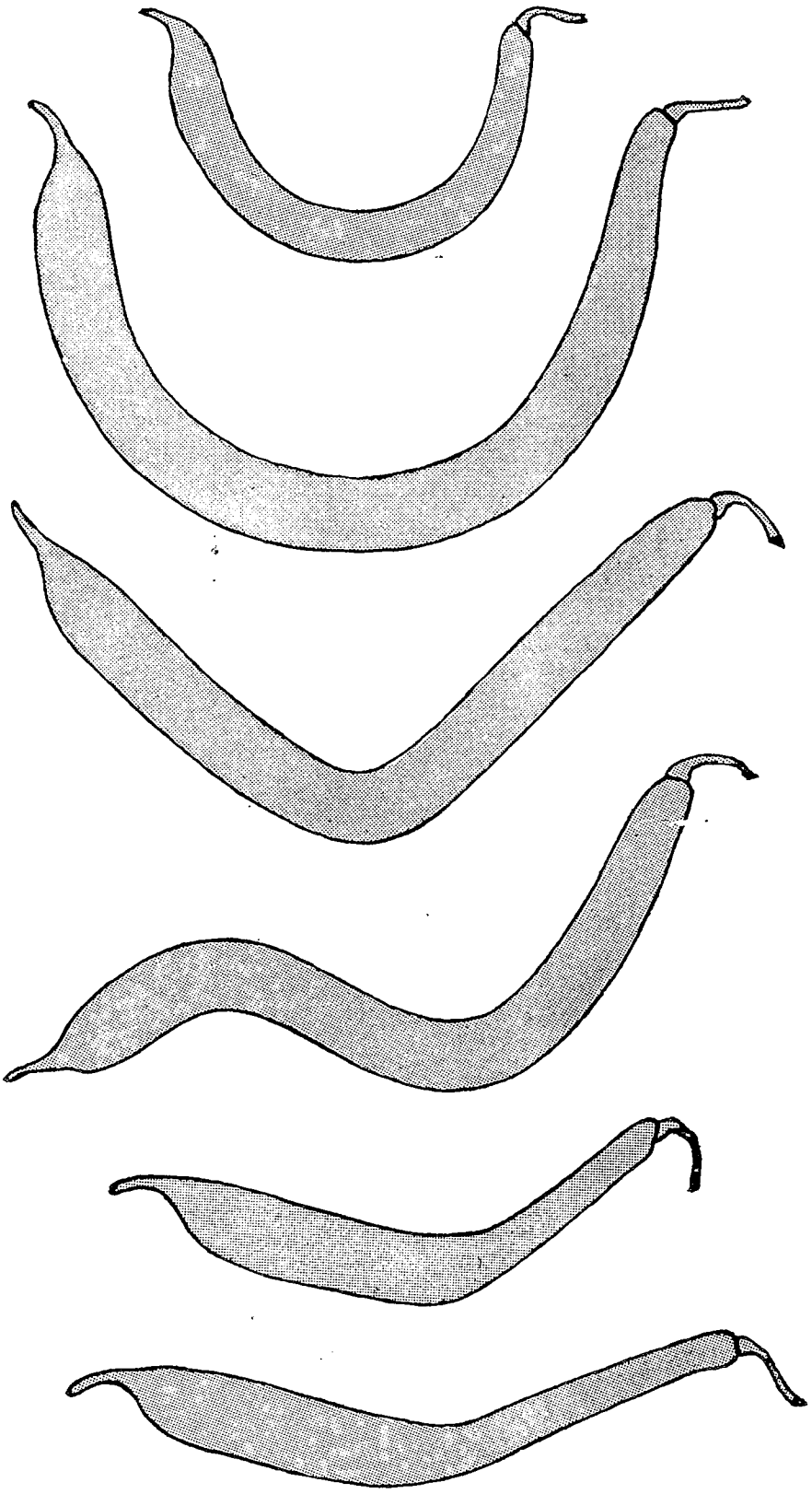


BROKEN ENDS -- NOT AT THICK PORTION OF BEAN

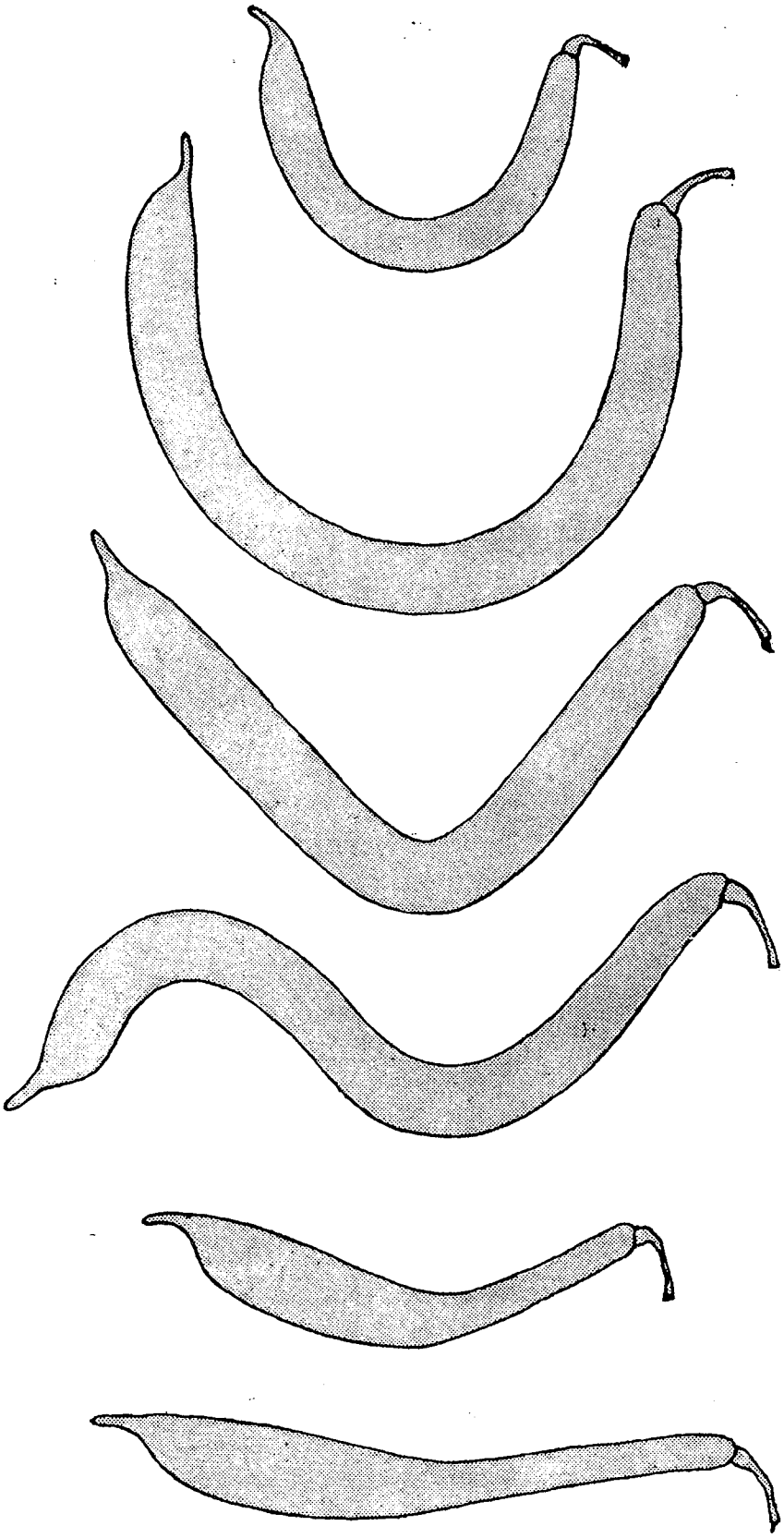




FAIRLY WELL FORMED
Poorest shapes permitted in U. S. No. 1 Grade.



NOT SERIOUSLY MISSHAPEN
Poorest shapes permitted in U. S. No. 2 Grade.



SERIOUSLY MISSHAPEN
Culls