

# Directive

9180.75

10-15-03

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## TESTING FOR PRESENCE OF WAXY CORN

### 1. PURPOSE

This directive establishes a uniform procedure for **determining the presence** of waxy kernels in a sample of corn. This testing service is available upon request from an interested person as official criteria for corn, under the authority of the United States Grain Standards Act as amended. This procedure is applicable only for determining the presence of waxy corn and does not replace the procedure for determining the special grade Waxy as detailed in the Grain Inspection Handbook, Book II, Chapter 4.

### 2. REPLACEMENT HIGHLIGHTS

This is a new directive.

### 3. EFFECTIVE DATE

This procedure is effective upon receipt.

### 4. BACKGROUND

Waxy corn is widely grown in the U.S., with the bulk of production located across central Illinois and Indiana, northern Iowa, southern Minnesota, and Nebraska where processors are located. Waxy corn is used to produce waxy cornstarch which is utilized by the food industry as a stabilizer/thickener and in the paper industry as an adhesive.

While the physical properties of waxy corn are valuable to some processors they are detrimental to other segments of the food industry.

In response to requests from the food industry to identify lots containing waxy corn kernels, FGIS is providing a procedure for testing and certifying (qualitative basis) corn lots that are tested “positive” for waxy kernels.

### 5. EQUIPMENT AND MATERIALS

FGIS employees must observe all GIPSA safety and health policies and procedures to avoid any potential safety or health hazardous situations.

a. Safety Equipment.

- (1) Full face protection shield.
- (2) Impervious plastic or rubber apron and gloves.
- (3) Impervious plastic or rubber apron and gloves.
- (4) Exhaust system.
- (5) Eye wash station.
- (6) Hand held spray.

b. Equipment.

- (1) Grinder. Romer Mill – Model 2A, Bunn Grinder, or equivalent, to coarsely grind samples.

**NOTE: The grinder must be adjusted so that 80% or more of the sample remains on top of an 8/64 round-hole sieve and that all kernels are broken open to expose the endosperm.**

- (2) Spray bottle.
  - (a) Dark-colored, trigger-spray, polyethylene bottle; or
  - (b) Amber colored borosilicate glass with atomizer bulb.
- (3) Wax paper, plastic wrap, or plastic sheets to spread on work surfaces.
- (4) Iodine stock solution.

**CAUTION: Protect containers of iodine (crystals and solution) from physical damage. Perform all mixing in a well ventilated area or within the working area of a laboratory hood.**

Follow steps (a) through (f) to prepare the iodine stock solution.

- (a) Weigh out 10 grams of iodine crystals and 20 grams of potassium iodide crystals.

- (b) Measure 1,000 ml of distilled water.
- (c) Pour the distilled water into an amber-colored bottle.
- (d) Dissolve the 20 grams of potassium iodide crystals in the distilled water.
- (e) Add the 10 grams of iodine crystals.
- (f) Mix thoroughly. Label the bottle "Iodine Stock Solution." Post "poison" labels on the bottles.

**NOTE: Iodine crystals and potassium iodide crystals can be purchased from chemical supply companies or from pharmacies.**

## 6. TESTING PROCEDURES

### a. Basis of Determination.

A representative portion of at least 35 grams of corn on the basis of the sample as a whole.

### b. Step-by-Step Procedures.

- (1) Pour 30 ml of the iodine stock solution into a spray bottle and dilute it with 30 ml of distilled water.
- (2) Coarse grind the 35 gram sample.
- (3) Carefully spray (do not soak) the entire sample with the iodine solution. If an 8/64 sieve was used to separate the broken kernels from the fine material, then spray only the material that remains on top of the sieve.

**CAUTION: Wear safety equipment. Spray iodine solution only in a well ventilated area or within the working area of a laboratory hood.**

**7. INTERPRETING RESULTS**

Shortly after spraying the kernels (approximately 1 to 3 minutes), the starch of waxy corn kernels will turn a red or reddish-brown color. The starch of nonwaxy kernels will turn a blue or violet color. (Reference: Interpretive Line Slide Nos. OF-7.9 and 7.91)

Analyze the sprayed kernels to determine if any waxy kernels are present. If a single kernel is determined to be “waxy”, consider the sample as positive for the presence of waxy corn, otherwise, the sample is negative for waxy kernels.

**8. CERTIFYING RESULTS**

Certify the results of the test in the “Remarks” section of the certificate.

Results are certified in the “Remarks” section of the certificate with one of the following applicable statements.

“This sample contains waxy corn.”

or

“This sample does not contain waxy corn.”

*/s/ David Orr*

David Orr, Director  
Field Management Division