

# **Basic Textile Operations**

**Level -I**

## **Learning Guide -32**

**Unit of Competence: - Operate Cotton Ginning**

**Machines And**

**Control Bale Press Operations**

**Module Title: - Operating Cotton Ginning**

**Machines and Controlling Bale**

**Press Operations**

**LG Code: IND BTO1 M09 LO4-LG-32**

**TTLM Code: IND BTO1TTLM 0919v1**

**LO 5: Dispose of waste materials**



## Instruction Sheet

## Learning Guide 31

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Keeping waste minimum
- Recycling waste
- Disposing machine waste

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Keep waste minimum in the ginning process
- Recycle waste of process
- Dispose not usable machine waste

### **Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -**.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.



<b>Information Sheet-1</b>	Keeping waste minimum
----------------------------	-----------------------

## 1. Waste minimization

Waste minimization is a set of processes and practices intended to reduce the amount of waste produced. By reducing or eliminating the generation of harmful and persistent wastes, waste minimization supports efforts to promote a more production in ginning.

Waste minimization involves redesigning products and processes and/or changing societal patterns of consumption and production.

Proper waste minimization and disposal can save a significant amount of time and resource. Significant reduction of the waste generated in health-care establishments and research facilities may be encouraged by the implementation of certain policies and practices, including the following:

Source reduction: measures such as purchasing restrictions to ensure the selection of methods or supplies that are less wasteful or generate less hazardous waste.

- Recyclable products: use of materials that may be recycled, either on-site or off-site.
- Good management and control practices: apply particularly to the purchase and use of chemicals and pharmaceuticals.
- Waste segregation: careful segregation (separation) of waste matter into different categories helps to minimize the quantities of hazardous waste.

<b>Self-Check -1</b>	<b>Written Test</b>
----------------------	---------------------



**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are the purpose of waste minimization in ginning? (5 pts.)

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

**Answer Sheet**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Short Answer Questions**

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



<b>Information Sheet-2</b>	<b>Recycling waste</b>
----------------------------	------------------------

## 1. Recycling wastes

### Cotton recycling Process

Cotton recycling prevents unneeded wastage and can be a more sustainable alternative to disposal. Cotton can be recycled from pre-consumer (post-industrial) and post-consumer cotton waste. Pre-consumer waste comes from any excess material produced during the ginning production of yarn, fabrics and textile products, e.g. selvage from weaving and fabric from factory cutting rooms. Post-consumer waste comes from discarded textile products, e.g. used apparel and home textiles. During the recycling process, the cotton waste is first sorted by type and color and then processed through stripping machines that first breaks the yarns and fabric into smaller pieces before pulling them apart into fiber. The mixes are carded several times in order to clean and mix the fibers before they are spun into new yarns.

The resulting staple fiber is of shorter length compared to the original fiber length, meaning it is more difficult to spin. Recycled cotton is therefore often blended with virgin cotton fibers to improve yarn strengths. Commonly, not more than 30% recycled cotton content is used in the finished yarn or fabric. Because waste cotton is often already dyed, re-dyeing may not be necessary. Cotton is an extremely resource-intensive crop in terms of water, pesticides and insecticides. This means that using recycled cotton can lead to significant savings of natural resources and reduce pollution from agriculture.

### Uses

Recycled cotton is often combined with recycled plastic bottles to make clothing and textiles, creating very sustainable, earth-conscious products. Recycled cotton can also be used in industrial settings as polishing and wiper cloths and can even be made into new, high-quality paper. When reduced to its fibrous state, cotton can be used for applications like seat stuffing or home and automotive insulation. It is also sold as recycled cotton yarn for consumers to create their own items. Additionally, cotton waste can be made into a stronger, more durable paper than traditional wood-pulp based paper, which may contain high concentration of acids. Cotton paper is often used for important documents and also for bank notes since it does not wear off as easily. Cotton waste can also be used to grow mushrooms (particularly the indoor cultivation of *Volvariella volvacea* otherwise known as Straw Mushrooms).



Even though recycling cotton cuts down on the harsh process of creating brand new cotton products, it is a natural fiber and is biodegradable, so any cotton fibers that cannot be recycled or used further can be composted and will not take up space in landfills.

**Waste materials in ginning section which cannot be reused**

- coarse dirt remaining after recycled
- fly from the preliminary filters
- dust from the fine filters

<b>Self-Check -2</b>	<b>Written Test</b>
----------------------	---------------------

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why we recycle ginning wastes? (5 pts.)
2. What are non-recycle wastes in ginning process? (3 pts.)

**Note: Satisfactory rating – above 5 points points**

**Unsatisfactory - below 5**

**Answer Sheet**

Score = _____
Rating: _____



Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_.

2. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



<b>Information Sheet-3</b>	Disposing machine waste
----------------------------	-------------------------

### 1. Disposing machine waste

Approximately 50-60 percent of the energy consumed by a cotton gin is a consequence of pneumatic conveying. Relatively large volumes of air are needed to move seed cotton, trash, lint, and seed through the ginning process. Typically, 10-20 different fan/motor systems are used to move material from point to point. Each of these systems exhausts its conveying air to the surrounding atmosphere through some type of air pollution abatement system. Usually, centrifugal fan exhausts pass through cyclone collectors, while the axial-flow fan (condenser) exhausts pass through covered condenser drums. It is the gin manager's responsibility to capture and dispose of gin trash and to ensure that the gin's air pollution abatement system functions effectively.

.In the future the ginning industry will be faced with even more of a challenge to control particulate emissions.

The engineering associated with the trash/dust collection system of a gin plays a significant role in the total amount of dust emitted by the gin's materials handling system. Even if the gin has a well-engineered system, the total dust emitted varies with time of harvest and harvesting method. Increased dust emissions result from processing late-harvested cotton. Gins processing mechanically stripped cotton emit more dust than those processing mechanically picked cotton.

#### **Cotton Gin Trash (from research in America)**

Approximately 26 percent is trash, cotton crop is harvested by mechanical strippers; 73 percent is harvested by mechanical pickers; and 1 percent is scrapped cotton. The amount of seed cotton needed to produce one 480-lb bale of lint is about 1,500 lb for picked cotton and 2,260 lb for stripped cotton. The trash and dust in a bale ranges from 75-150 lb for picked cotton and 700-1,000 lb for stripped cotton. In a typical year, cotton gins in the United States processing spindle-picked cotton will handle 500,000-1 million tons of cotton gin trash. Those processing stripped cotton will manage 1 to 1-1/2 million tons of trash.

Common disposal methods for cotton gin trash include the following: (1) composting, (2) using it for cattle feed, and (3) direct application to land using spreader trucks. Caution should be used when feeding gin trash to cattle, since pesticide residues may be present in the trash. Cotton gin trash from a crop treated with arsenic acid should never be fed to cattle. Incineration is not allowed in most States and will likely be even less acceptable in the future. Composting of gin trash offers potential to reduce the negative attributes of "raw" gin trash. If this material is composted properly, there should be minimum live weed seeds and live





disease organisms and the trash volume should be reduced 40 percent. The resulting compost is valuable as a soil additive because it contains substantial nutrients.

The most common method of disposing of cotton gin trash is direct application to land using spreader trucks. Each ginner using this technology spends approximately \$10/ton of trash disposed. This cost is dependent upon the distance the trucks must travel to get to the disposal site. It is becoming difficult in some areas for ginner to acquire sites for trash disposal. At \$10/ton to spread trash on the land, the cotton ginning industry would spend \$15-\$25 million each year for solid waste disposal. The gin trash, however, does return nutrients to the soil.

### **Air Pollution**

The goal of air pollution control is to minimize deterioration of air resources so that the public can breathe the best quality air possible. Typically, a construction permit must be obtained from the State air pollution control agency prior to initiation of gin construction. In addition an operating permit must be approved by this agency prior to operating, and this permit must be kept current. Construction permits are also needed before modifying existing facilities if the modifications may increase emissions. State air pollution agencies usually have authority to administer penalties and fines to violators. The time required to obtain permits can exceed 90 days in some States. It is important that gin management be aware of and comply with the permitting requirements in their State.

In some States, the EPA standards entitled "Particulate Emission Factors for Cotton Gins with Controls" (1985) are used for permitting gins. According to EPA emission factors, a gin that has controls and processes 10 bales/hr. should emit no more than 22.4 lb/hr of total particulate, with the major emissions being from the unloading fan (3.2 lb/hr) and from the number 1 lint cleaner condenser (8.1 lb/hr). Other information regarding emission factors is available in EPA standards (1975, 1978), Kirk et al. (1979), National Enforcement Investigations Center and EPA Region IX (1978), and Parnell and Baker (1973).

(Read Cotton Ginners Handbook, edited via W.S. Anthony and William D. Mayfield).



<b>Self-Check -3</b>	<b>Written Test</b>
----------------------	---------------------

**Directions:** Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Most of removed by using\_\_\_\_\_. (2 pts.)
  - A) Air
  - B) Water
  - C) Car
  - D) Man power
2. Write purpose of waste disposal. (5 pts.)

**Note: Satisfactory rating -above 5 points points**

**Unsatisfactory - below 5**

**Answer Sheet**

Score = _____
Rating: _____

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Short Answer Questions**

1. \_\_\_\_\_.
2. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

