

Pradhan Mantri Formalisation of Micro food processing Enterprises (**PM-FME**) Scheme

WALNUT PRODUCTION TECHNOLOGY

National Institute of Food Technology Entrepreneurship and Management
(**NIFTEM**)

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Introduction

- “Walnut” originates from “wahnut” , an old English word for “welsh-nut”
- It is also known from different names “Akhrot” in Hindi , “doon” in Kashmiri , “Gardgani” in Unani.
- The greeks called walnuts karyon, meaning “head ”, because the shell resembles a human skull and the walnut kernel its self looks like a brain.



Overview of Walnut

- Family : *Juglandaceae*
- Centre of Origin : Central Asia
- Chromosome No : $2n = 32$
- Fruit Type : Nut
- Edible part : Cotyledon
- Bearing : Axillary old Branches
- Nature of Fruit : Non-Climecteric.
- Hight of plant : 10-40 m tall.

- Walnut (*Juglans sp.*) important temperate nut fruit having several health benefits.
- It is grown in Jammu and Kashmir, Uttarakhand, Himachal Pradesh.
- The seedling trees attain giant size and start bearing nuts of variable size and shape after 10-15 years.
- Vegetatively propagated plants are true to type and produce uniform size nuts after 4-5 years. They remain within manageable size.
- Most valuable exchange earning nut crop.

Market potential and export of raw material

- The Global Walnut Market is projected to register a Compound annual growth rate (CAGR) of 6.0% over the forecast period (2019-2024).
- Increasing Demand in the Food Processing Industry.
- Use of key ingredients in culinary arts to develop new recipes .
- Different new products in food industries, nutraceutical and cosmetic industries .
- India has exported 1,648.26 MT of walnuts to the world for the worth of Rus. 52.73 Crores/7.33 USD Millions During the year 2019-20.
- The major importing countries of walnut from India are France , U.K , Germany , U Arab Emts , Netherland.

Source : APEDA Agri exchange

http://agriexchange.apeda.gov.in/product_profile/prodintro/Walnuts.aspx

Variety and types of walnut

- There are many different varieties of walnuts , of which only three traditional varieties :



1.Black walnut "*Juglans nigra*"



2.English or Persian walnut "*Juglans regia*"



3.White or butternut walnut "*Juglans cinerea*"

Source : Pal, M. J. F. N. O. (2020). "Walnut: A highly nutritious food with several health benefits." **3**(1): 118.

Flowering of walnut

- Flower Separate Pistillate (Female) and Staminate (Male)



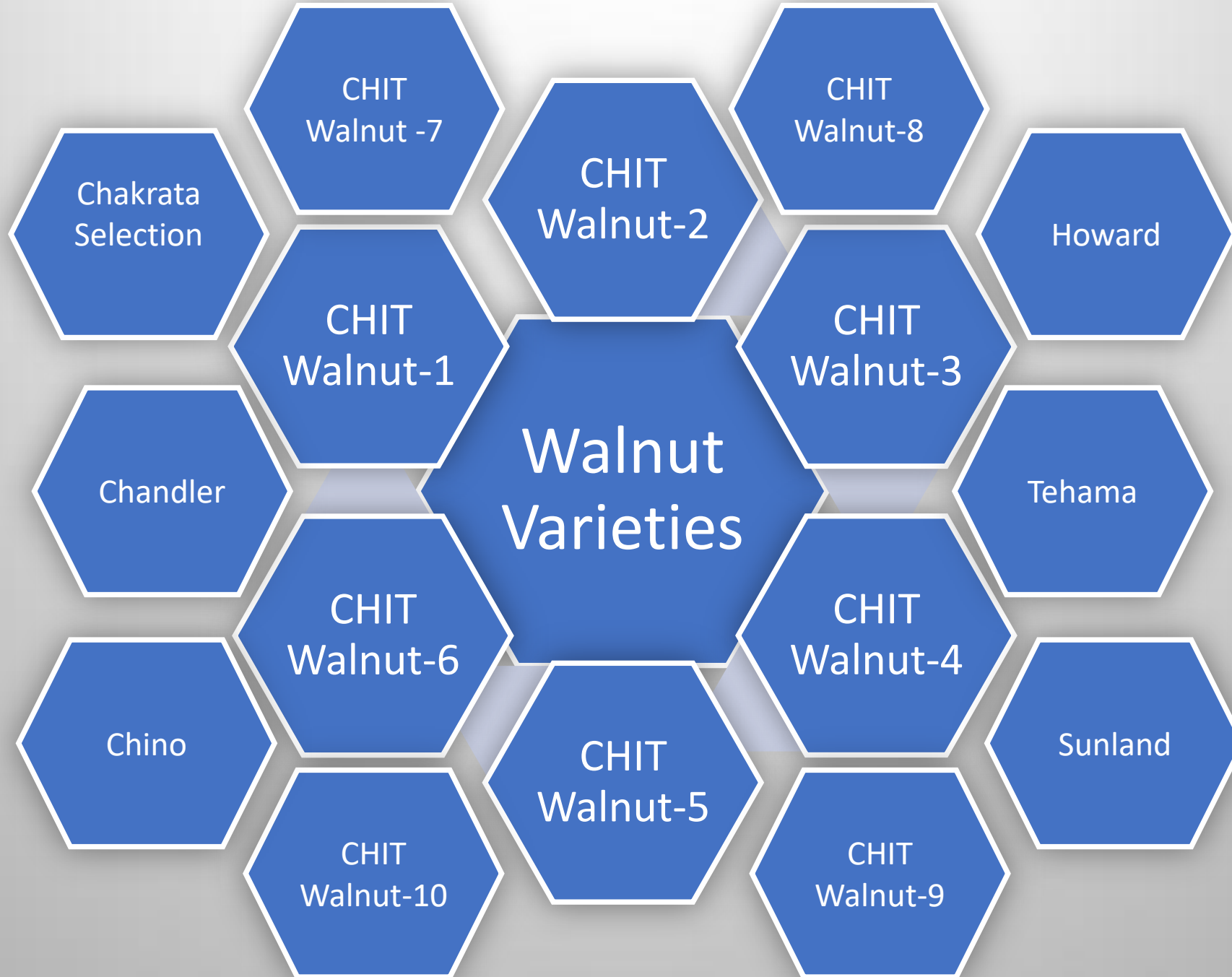
Female
Flower



Male
Flower



Popular varieties of walnut grown in India



Walnut importance and utilization

- Most parts of the plant are utilized in one or other way but fruit and timber has maximum use.
- Important fruit of the India being exported to more than 40 countries providing more than Rs. 300 Crore of foreign exchange annually.



Use of walnuts

- Immature fruits utilized in production of pickles , chutneys , marmalades , press juice and syrups.
- Walnut oil for menstrual dysfunction.
- Walnut timber , used for craving , making furniture and butts of guns.
- Walnut shell flour used as diluents for agriculture insecticides.
- Walnut kernels used in confectionary and bakery items.
- Walnut used in cosmetic products.

Walnut Production

Production of walnut with shell in 2019 of world

	Area harvested (ha)	Yield (hg/ha)	Production (Tons)
World	1305349	34462	4498442
Oceania	11224	3893	4369
Asia	830484	38489	3196412
Africa	12243	27684	33893
America	309415	29470	911854
Europe	141983	24786	351914

Source : FAOSTAT of the united nations

<http://www.fao.org/faostat/en/#data/QC> accessed on Jan 21 , 2021

Walnut processing

1. Harvesting

- The Nuts are mechanically shaken from the trees. (Harvesting tools).

2. Harvest collection

- After Harvesting nuts fall on the ground, and picked up by windrows. (Mechanical collector tool)

3. Drying

- Picked up harvest transported to holler drier, in which green outer husk or other material is been removed

4.Washing

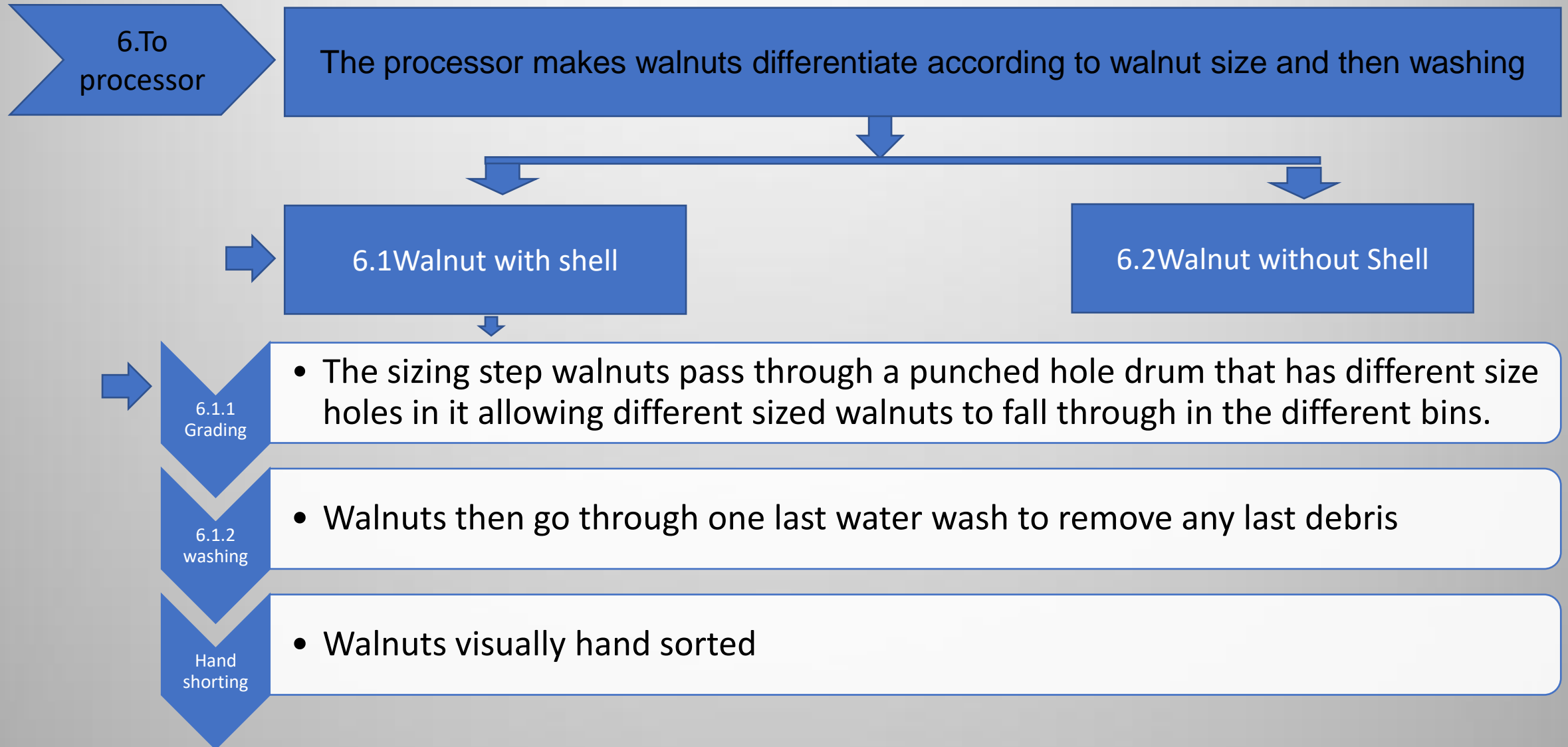
- Walnuts were washed to remove dirt and other material

5.Drying

- After washing walnuts were dried to stable moisture around 8% by solar drying.

6.To
Processor

- Walnuts are then delivered to the processor.



Filler

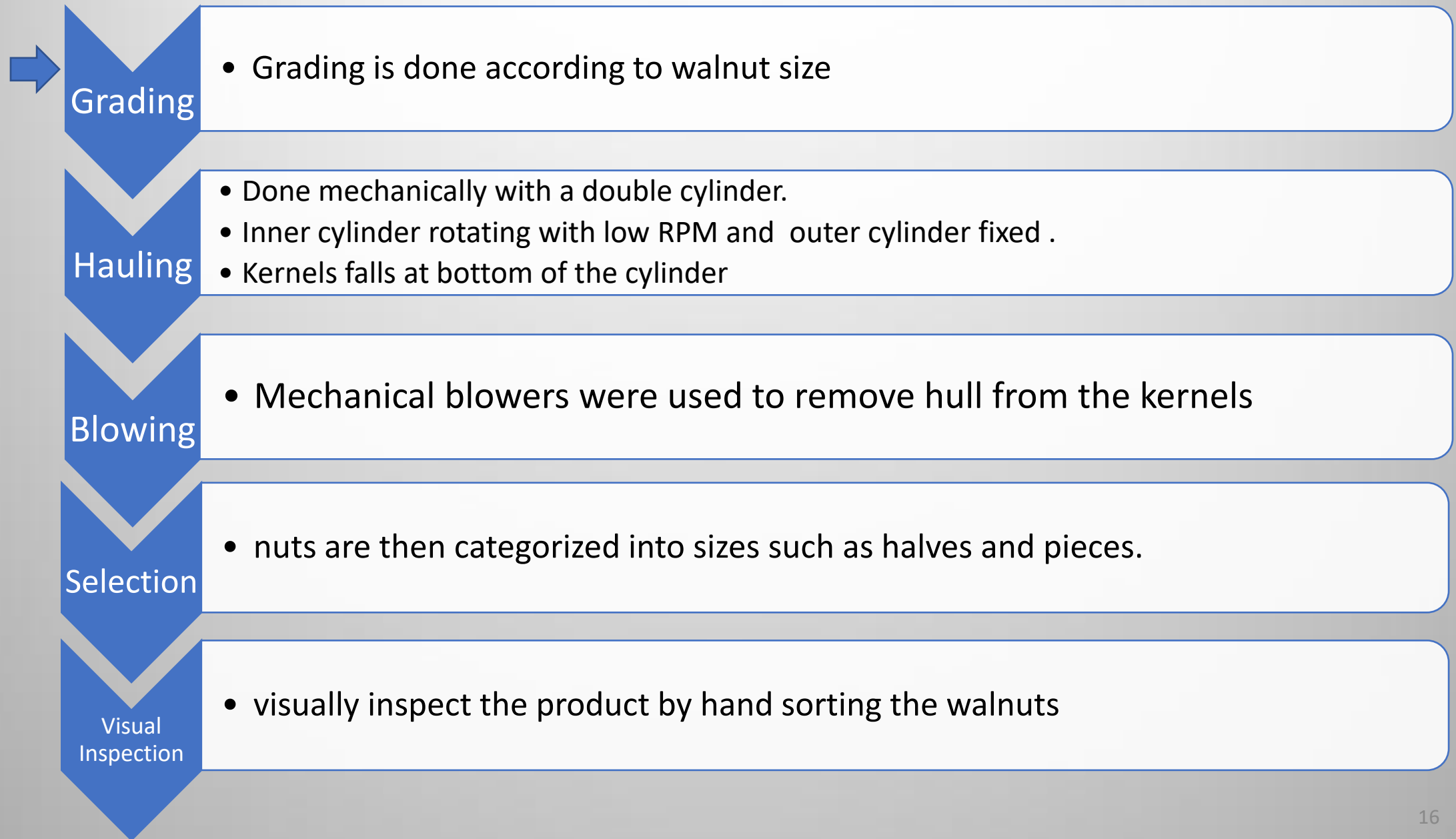
- packaged into sacks the in-shell walnuts

Packaging

- Packed and sealed in different weight and size.

Shipping

- primarily shipped to export markets



Filler

- packaged into sacks the walnut Kernels

Packaging

- Packed and sealed in different weight and size.

Shipping

- primarily shipped to export markets



Nursery



Mature Tree



Mature Walnuts



Harvesting



Windrows



Collection



Drying



Washing



Drying



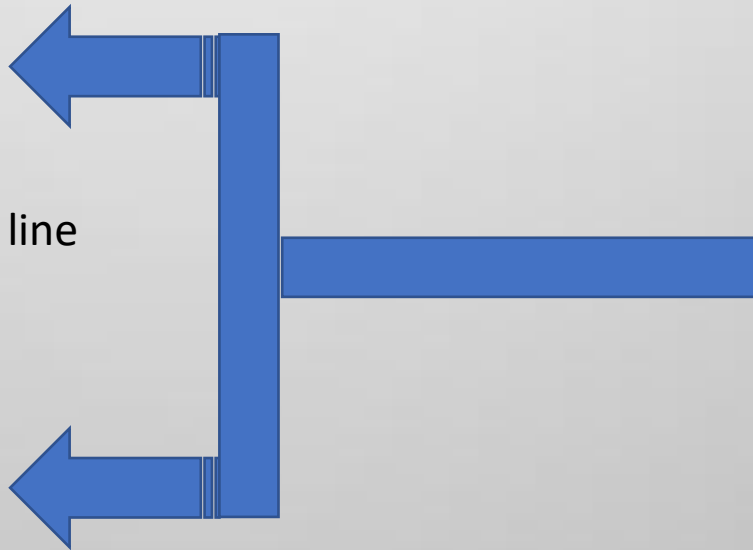
To processor



Walnut in shell production line



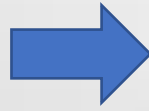
Walnut in shell production line



Walnut in shell production line



To processor



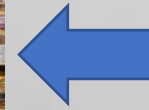
Grading



visual inspection



To markets



Shipping



Packaging



Processor

Hulling

Visual inspection



Market

Shipping

To Filler (Packaging)

Thank you !

