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MAIZE combine

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TYPES OF CORN HARVESTER

SNAPPER

**PICKER
HUSKER**

**PICKER
SHELLER**

**CORN
COMBINES
WITH CORN
HEADER**



Plot combine for harvesting maize crop

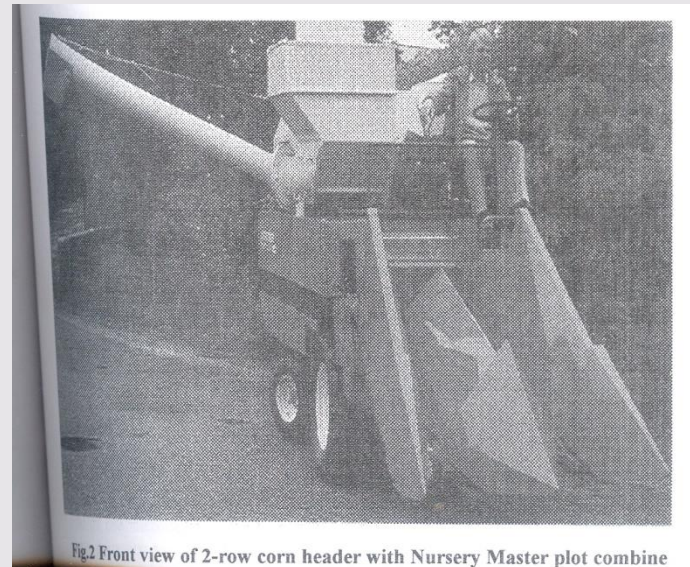


Fig.2 Front view of 2-row corn header with Nursery Master plot combine



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TYPES OF CORN HARVESTER

BASIC COMPONENTS

Gathering unit to guide the stalks to the machines

Lugged gathering unit to assist feeding of stalks to the rolls and moving the stalks and snapped ears rearward through the snapping zone

Snapping roll to remove the ears from the stalks



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TYPES OF CORN HARVESTER

CORN SNAPPER

All the units mentioned before + an elevating conveyor to deliver the ears into a trailing wagon

CORN PICKER HUSKER

Addition of husker bed

PICKER SHELLER

Addition of shelling unit instead of a husking unit

CORN COMBINE

Grain combine can be used

Corn header used instead of grain header

Has a basic gathering & snapping unit + conveying unit + a shelling (threshing) unit



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GATHERING UNIT

Mostly of 2,3,4 or 6
row units to handle
row spacing of 92
to 102 cm

Row spacing can be
changed

Can gather standing
stalk & lodged
stalk with minimum
ear loss

This requires pick up
devices close to
the ground

Each Snapping unit
work
independently by a
gear casing run by a
transverse shaft

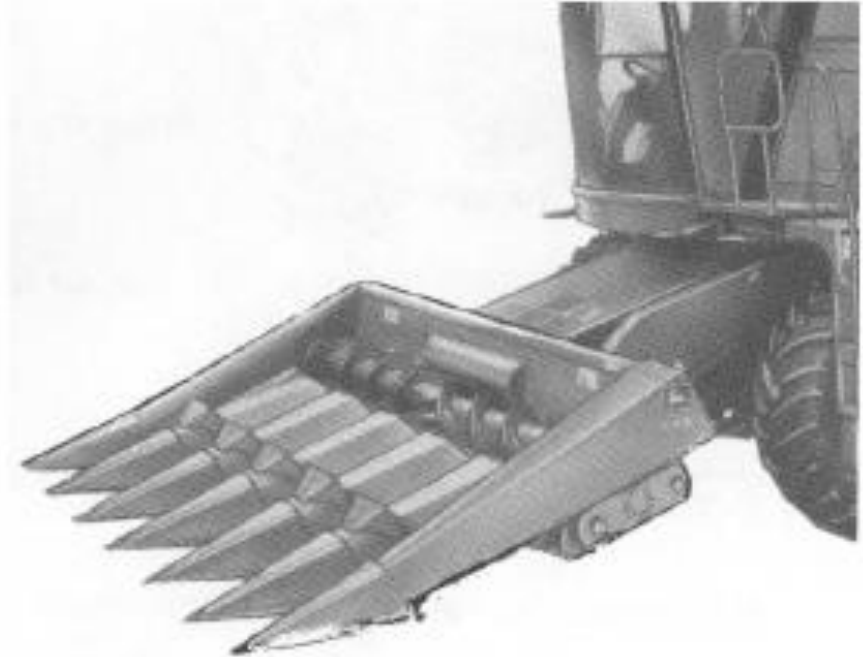


Figure 12.13 – A six-row corn header
(reproduced by permission of Deere and Co. © 1991).



GATHERING UNIT

For minimum loss of ears gathering points must be as close to the ground as possible

Handling of lodged crop depends on degree of lodging, **top profile of gathering unit** & forward speed.

Gathering chain with fingers helps moving the stalks into & through the snapping chamber

The **chain speed equal to the forward speed** when stalks are upright

Chain speed more than forward speed when stalks are lodged

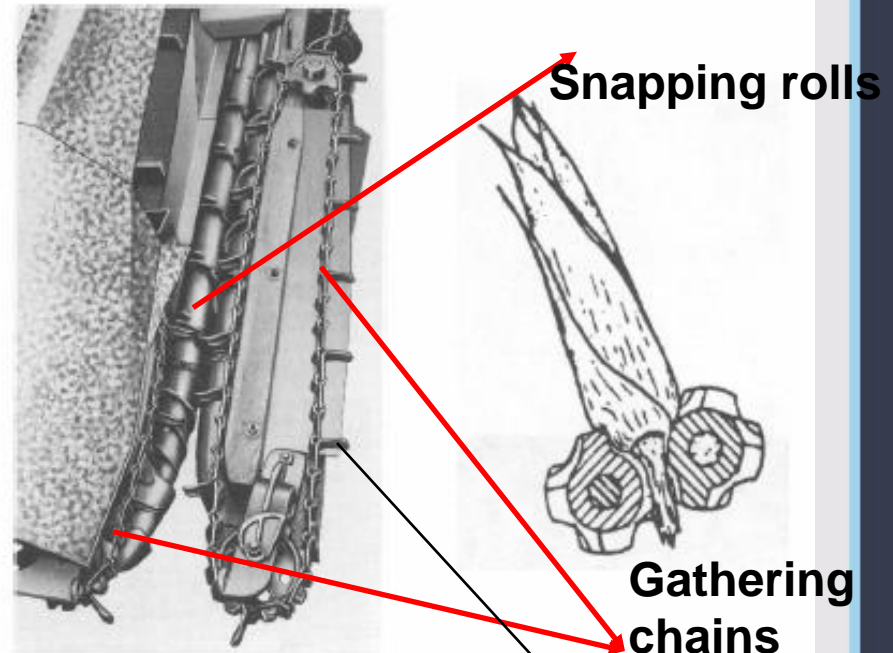


Figure 12.15 – Spiral-ribbed snapping rolls of a corn header, showing operating principles. Left, reprinted from Kepner et al. (1978); right from Wilkinson and Braumbeck (1977).

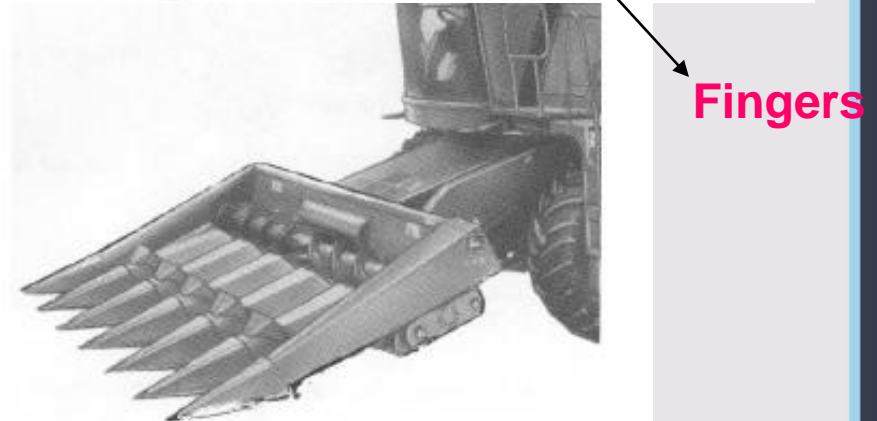


Figure 12.13 – A six-row corn header (reproduced by permission of Deere and Co. © 1991).



SNAPPING UNIT(SPIRAL RIBBED)

Aggressiveness increase from front to rear

The ribs move the stalk rearward

Roll length vary from 102 – 127 cm

Dia: 7.5 -10 cm

Peripheral speed: 180m/min.

Higher speed or More aggressive surface → butt shelling

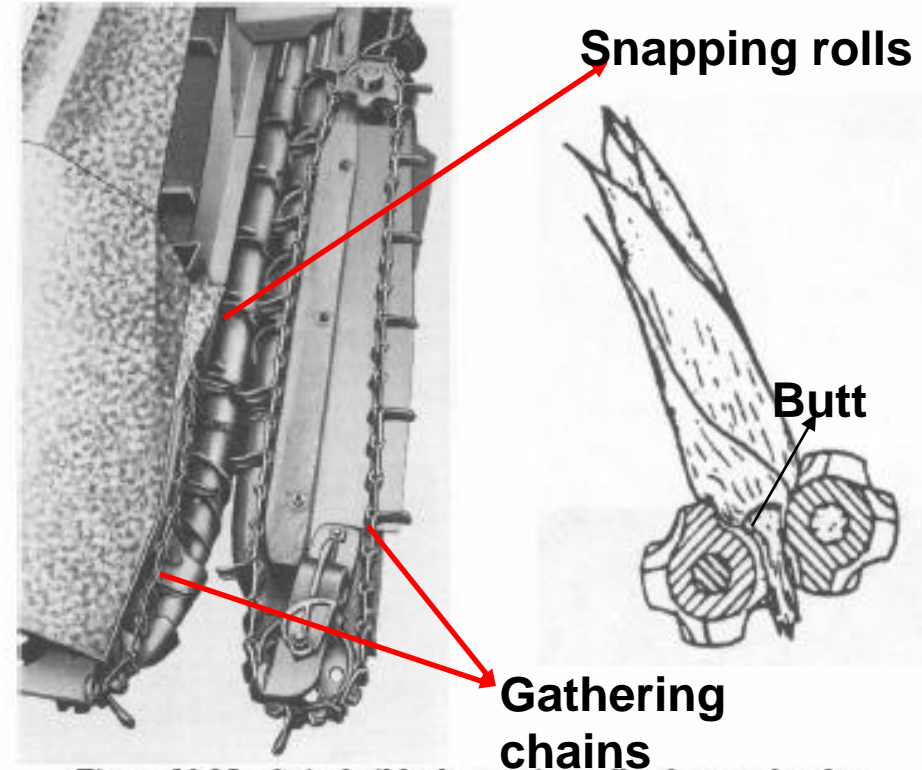


Figure 12.15 – Spiral-ribbed snapping rolls of a corn header, showing operating principles. Left, reprinted from Kepner et al. (1978); right from Wilkinson and Braumbeck (1977).



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Trash removal

Trash rolls to remove trash & broken stalks

Flutes section on upper end of the snapping rolls

Transverse fluted roller mounted at the rear snapped ear conveyer to remove long section of the stalk.

Trash
Rolls

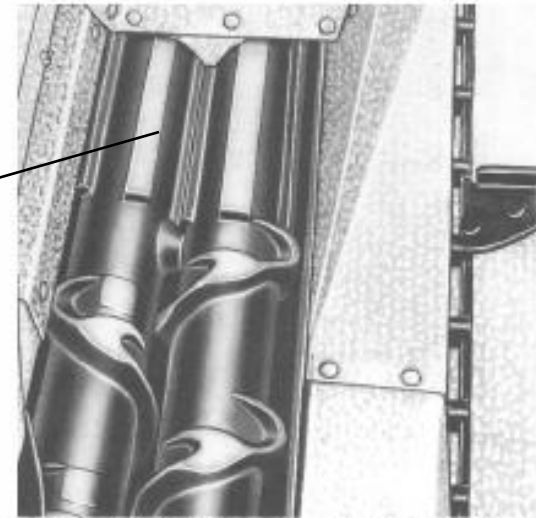
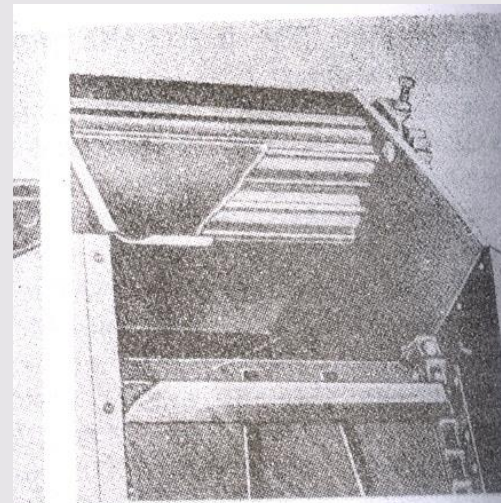


Figure 12.16 – Fluted trash rolls on the upper ends of snapping rolls (reprinted from Kepner et al., 1978).



ends Fig. 18.5. Fluted-roll stalk remover at the upper end of a corn elevator. (Courtesy of White Farm Equipment Co.)



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A pair of rolls to grasp the husk & pull them downward between the rolls

Most husk beds have 2-3 pairs of rolls for each row of corn

Rolls may be in separate husking bed at the end of the snapping unit or may be at the end of the snapping unit

Dia: 6.4 – 7.6 cm

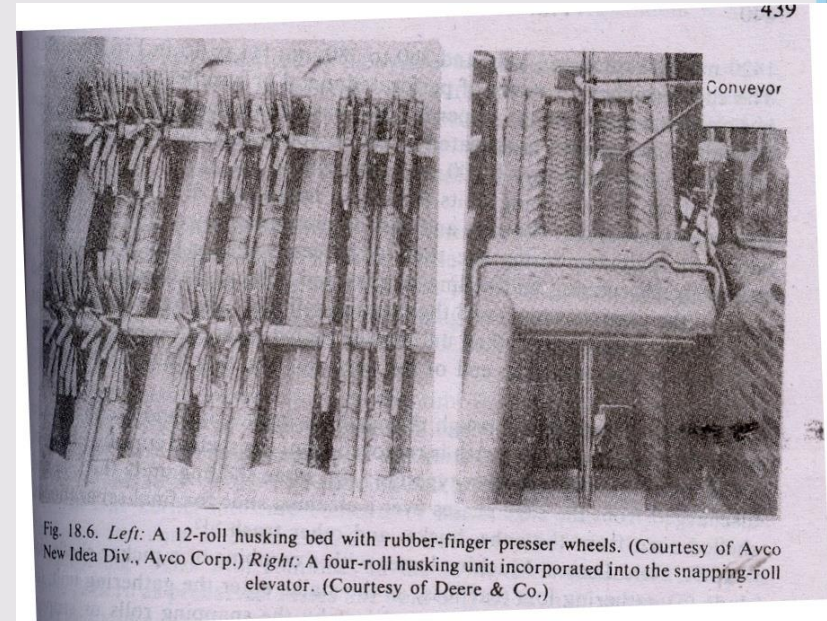
Length: 76 – 127 cm

RPM: 500

Feed mechanism known as ear retarder or ear forwarder hold the ears against the rolls and move them across the rolls at uniform speed.

A sieve below to recover shelled corn

HUSKING UNIT





SHELLING & CLEANING

Rasp bar cylinder for shelling

Concave clearance: 25 -32 mm at the front and 16 – 22 mm at the rear

Peripheral speed: 12.7 – 20.3 m/s

Axial flow cage type shellers in picker Sheller.

Cylinder with lugs/spiral flutes/paddles in a stationary cage

RPM: 700-800, Peripheral speed: 6.1 – 10.2 m/s

Dia: 28-38cm, Length: 102 – 142 cm.

Cage periphery (Concave) with perforated metal or parallel round bars

Shelling is done by rubbing & rolling of the ears and cobs against each other and against the cage

Shelled corn falls through opening and collected at the grain tank.

Air blast removes light stalks