

# **X Series Combine and Front-End Equipment**

## **Optimization**

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**“Ready To Harvest” for All Corn Crops  
Wet/Dry Corn - Food Corn - Popcorn**



**John Deere Harvester Works**

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## **Preface**

The content of this material is intended to help you know how to choose the best configuration and set up an X Series combine and corn head, for any Corn crop and condition before going to the field.

Ag Sales Manual Option codes are included to be able to correctly configure a corn combine and field installed bundles are explained for attachments, to enhance performance and Grain Quality in specific corn conditions.

Setup and Adjustment recommendations are intended as a starting point before harvest season. Additional adjustments and fine tuning will be necessary depending on crop moisture and harvest conditions.

Crop setting checklists and Grain Quality Tips are a quick reference for configurations and operating speeds to help optimize grain quality.

## Options & Attachments for CR & CF Heads

### Active End Fender Kit

Active End Fenders assist in pulling down/leaning corn stalks that are riding up the end fender into the head, thereby reducing stalk whipping and ear tossing and enabling faster harvest speeds in down/leaning crop conditions.



### AutoTrac™ RowSense™ Sensors

(GPS) steering system reduces overlap and fatigue during harvest. On top of steering the machine, an operator is required to monitor several other areas such as the header feeding, ground terrain, combine settings, or managing tender trucks and grain carts. Operating at night, while harvesting lodged or down corn conditions can add stress for the operator.



### Stalk Deflectors

These are mounted directly to corn head frame. No additional tool bar is required for mounting, allowing these to be Trailer compatible with easy single pin conversion process (per row unit).



### StalkMaster™

Leave a uniform spread of residue that speeds decomposition while protecting the soil from wind, water, and erosion. StalkMaster will size corn stalks thoroughly and evenly to help better manage residue.



## Stalk Roll Options for Residue Management

- **Opposed Stalk Rolls**

- The opposed knife stalk rolls are the best equipment option when typical corn harvesting conditions are dry and producers are using the StalkMaster stalk chopping option. Feature benefit: Majority of stalk material will be sized at 12 inches or longer to provide soil protection from wind and water. Designed to harvest with low power consumption for high performance and low fuel consumption.



- **Intermeshing Stalk Rolls**

- The intermeshing knife stalk rolls are the best equipment when the typical harvesting condition is wet corn and using the StalkMaster stalk chopping option. Feature benefit: Majority of stalk material will be sized at 6 inches or longer to provide soil protection from wind and water. Designed to harvest with low power consumption for high performance and low fuel consumption.



- **RowMax™ Chopping Stalk Rolls**

- Size residue to 3 inches or less with the RowMax Chopping Stalk Roll. Designed for higher performance of stalk processing & decrease residue breakdown time. Compatible on MY12 600C/FC and newer along with 700C/FC and CR/CF model corn heads.

- ❖ **Changing any stalk roll configuration will require the corresponding grass knives for each roll type. Contact your local dealer for the corresponding grass knife part numbers.**



## Corn Head Inspection and Adjustments

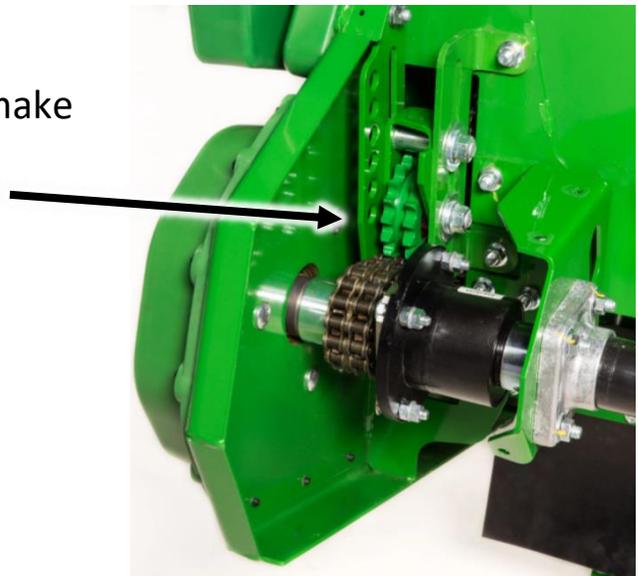
The following adjustments are critical to ensure that the corn head performs to its optimum performance:



- Auger Chain Drive Tension
- Deck Plate Spacing
- Corn Head Cross Auger Height
- Auger Stripper Plate Adjustment
- Feeder House Variable Speed (Corn Head back shaft Speed)

### Auger Drive Chain Tension

Inspect the auger drive chain and make sure the chain is tight.



### **Deck Plate Spacing**

The spacing can be changed for different harvesting conditions. Deck plates should be set narrow to keep grain losses at a minimum yet wide enough to keep trash intake at a minimum. The general rule: maximum spacing should be no more than 3mm (1/8 inch) wider than the diameter of the typical cob and no less than 3mm (1/8 inch) wider than the diameter of the corn stalk.



**Dry Conditions** – Adjust the deck plates wider to minimize trash intake but not too wide to increase grain loss. A small amount of trash intake to cushion ears as they impact the deck plates to prevent butt shelling is preferred.

### **High Moisture Corn >25% and Popcorn**

Set corn head deck plates close to take in some trash to cushion the ears as they hit the deck plates. High moisture corn leaves are usually still green and will not shred or break apart as easily as dry stalks. Be careful with too many green stalks and leaves because they can plug concaves and severely limit separation which increases rotor loss.

### **Corn Head Cross Auger Height**

The auger position is factory set in the down position. Do not raise the auger too high so that the ears will pass freely under the flighting. Flighting will scuff the kernels if too high.



### **Very Dry Conditions**

To minimize dry trash intake, move auger down.



### **High Moisture Corn and Popcorn**

To minimize grain damage, lower auger down.



### **Auger Stripper Plate Adjustment**

Stripper plates should be adjusted as close to the auger as possible without rubbing at any point on the flighting. This will help to prevent grain damage and pre threshing due to material wrapping on the auger.



## Corn Head Back-Shaft Speed, Variable Drive Feeder House

- Operate the corn head at the higher variable speed drive range 520-690RPM. Faster corn head drive speeds allow the stalk rolls to pull more trash down and through resulting in a higher level of stalk processing.
- If you see pulled root balls or tall leaning stubble, Increase the back-shaft speed to allow proper corn head performance at higher ground speeds. X9 combines have the capability of harvesting at faster ground speeds and may require the back-shaft speed to be increased.



### ***DO NOT OVERSPEED THE BACK-SHAFT.***

*Excessive back-shaft speed can cause butt shelling and or kernel damage.*

## High Moisture >25%

**520-580 RPM recommended.** Greener stalk/leaves do not strip off the stalk as easily. This helps prevent grain damage, decreased MOG intake, cleaner grain tank potential, and lower risks of grain loss.

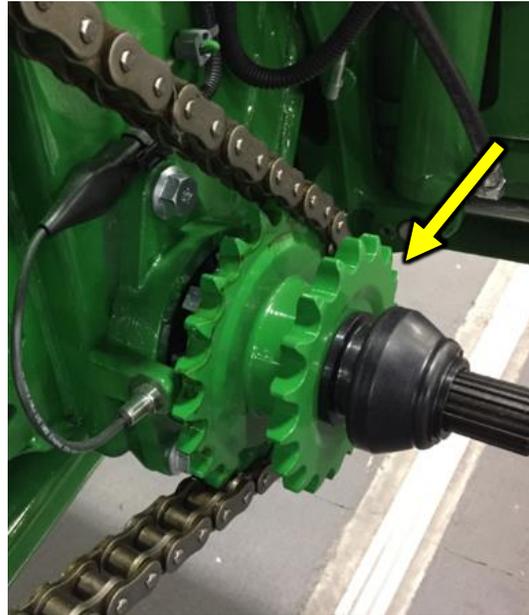
## Dry Conditions <25%

**510- 690RPM Recommended,** without excessive butt shelling. The faster corn head drive speeds allow the stalk rolls to pull more trash down and cushion the ears to minimize butt shelling.

## Combine Configuration and Setup

### Feeder House Chain Drive Speed

Slow 18T small diameter sprocket



### Feeder House Drive Chain Tension



Replace chain when Idler has reached the end of adjustment slot.

## Back-Shaft Speed Feeder House Variable Drive

- Operate the head at slow speeds.  
Increase back-shaft speed as harvesting  
ground speed increase.  
X9 - 520rpm



## Rotor Speed

- 1<sup>st</sup> Gear (300-520rpm range)

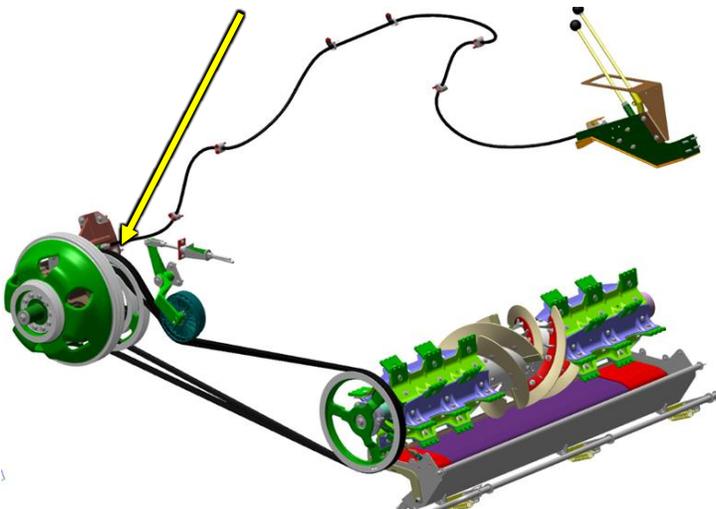
## Feed Accelerator Speed

- Low speed 1<sup>st</sup> Gear – 440rpm
  - W/optional Slow Speed Kit – 310rpm
    - *The Slow Speed Kit recommended for improved grain quality in corn.*



## Optional Slow Speed Kit

New Pulley & Belt



**Concaves**, Round bar is the recommended concave in all three positions for grain damage since its overall performance is very good in all moisture conditions. Refer to your Operators Manual for how to Level Concaves (front to rear) and calibrated to “Zero” on clearance to the threshing elements.



Remove the **Material Deflectors** from the outside portion of the separator grates. These deflectors need to be removed from both sides of the machine to promote separation and prevent potential rotor loss while harvesting corn.



**Separator Grates** be sure separator grate spacers are between the separator grates and the top rail for corn. This will lower the grates and minimize cob damage from rotor tines and small pieces of cob in the grain tank. *This will need to be done on both sides of the machine for both rotors to match.*



### **Active Tailings System**

Set the lever UP to the open position to open the concave for corn.



## Chopper speed in Low

Pull lever out, to the corn position.



## Adjustable Knife Bank Engagement

Fully retract the knife bank for corn harvest.

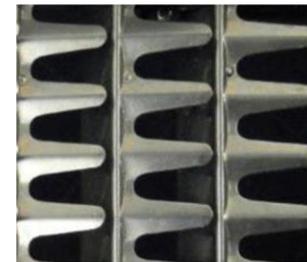
- Manual adjustment.
- In cab adjustment (if equipped.)



## Cleaning Shoe

Deep-Tooth chaffer and sieve are recommended for field corn.

*Note: General Purpose Chaffers are recommended for Food Corn and Popcorn*



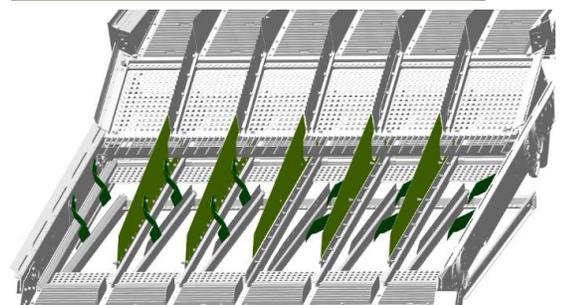
**Be sure chaffer and sieve are calibrated so the opening exactly matches the cab display settings.**

*If openings do not match, follow the Factory chaffer and sieve calibration procedures.*



## Sidehill Performance Package

Recommended for sidehill conditions to help retain a level shoe load in sidehill conditions for proper grain cleaning and preventing grain loss from uneven and overloaded bays. Includes full-length tall chaffer dividers and crop deflectors.



**Front chaffer should be set at 25mm for ALL crops.**



## Wet >25% Moisture Corn Adjustment Checklist

### Outside

- Feeder House Drive Chain Speed = 18T sprocket
- Front Chaffer = 25mm
- Feed Accelerator shifted into 1<sup>st</sup> Gear
- Rotors shifted into 1<sup>st</sup> Gear
- Corn Head Auger = Down position

### Inside

- Deck plates closed tight (*slightly larger than the average stalk*)
- Back shaft Speed = 520-580rpm
- Cleaning Fan speed = 1250-1430rpm
- Deep Tooth Chaffer = 16-24mm
- Deep Tooth Sieve = 11-15mm
- General Purpose Chaffer = 17-24mm
- General Purpose Sieve = 12-16mm
- Rotor Speed = 360-520rpm
- Concave Clearance = 24-40mm

### Auto Header Controls

- Height Resume
- Height sensing
- Lateral Tilt
- Fore/Aft Resume
- Deck Plate Position Resume



## Dry < 25% Moisture Corn Adjustment Checklist

### Outside

- Corn Head Auger = Down position
- Feeder House Drive Chain Speed = 18T sprocket
- Feed Accelerator shifted into 1<sup>st</sup> Gear
- Rotors shifted into 1<sup>st</sup> Gear

### Cleaning System

- Measured Chaffer and Sieve settings match display
  - Left and right side of elements match
- Front Chaffer = 25mm

### Separator

- Separator grate spacers in the storage position
- Round Bar concaves leveled/zeroed
- Active tailings Set to Corn

### In-Cab

- Deck plates half to closed (*minimize MOG intake & butt shelling*)
- Back-shaft Speed = 520-690rpm
- Cleaning Fan speed = 1250-1430rpm
- Deep Tooth Chaffer = 15-23mm
- Deep Tooth Sieve = 11-15mm
- General Purpose Chaffer = 17-24mm
- General Purpose Sieve = 12-16mm
- Rotor Speed = 340-480rpm
- Concave Clearance = 24-40mm

### Auto Header Controls

- Height Resume
- Height sensing
- Lateral Tilt
- Fore/Aft Resume
- Deck Plate Position Resume



## Grain Quality Tips for High Moisture Corn, Food Grade Corn

1. Check concaves for level front to rear. Concaves out of level may cause a pinch point increasing damage potential.
2. Calibrate and “Zero” the concave position sensor.
3. Check all the auger flighting to be sure there are no sharp edges.
4. Minimize free grain in tailings/re-thresher as much as possible.
5. Do not run corn head auger in up position. Flighting can scuff kernels on the ears.
6. If new parts that contact the crop have been installed, run the combine in crop other than corn, to shine up any rough edges.  
Threshing elements, FAST Wear Strips, augers, etc.

### ***Extra measures to reduce chances of grain damage in specialty crops:***

7. Do not fill the grain tank over top of the loading auger; the corn boiling up above the loading auger can add to grain damage.
8. Do not unload grain tank completely empty. Leave some grain in the tank to cover the augers to minimize damage.
9. Do not unload the grain tank at high idle.

Harvest a short distance, perform a power shutdown and inspect machine/ground for leaks, grain loss, and grain tank cleanliness.

- Header to Feeder House connection
- Stone trap seals
- Shoe seals
- Auger trough and grain tank clean out closed

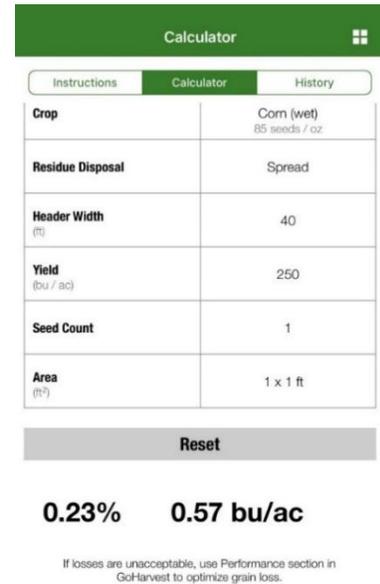
### Checking Harvest Loss

1. Preharvest loss
2. Header loss
3. Machine loss
4. Rotor loss
  - a. Un-threshed loss
  - b. Threshed loss
5. Shoe loss



### Calculate Loss Equipment Plus App

1. Verify crop type
  - *Change by selecting the menu at the top right of the screen*
2. Identify Residue Disposal
  - Spread
  - Windrow
3. Input the Header Width
4. Input the current Yield
5. Measure and input the Seed Count grain loss found
6. Identify the Area measured for known seed count



### Grain Loss Algorithm

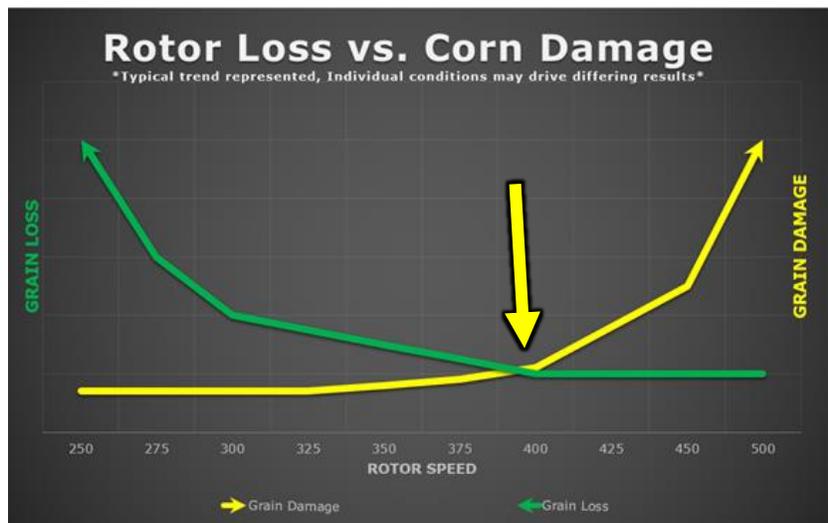
Starting in Model Year 2022, X Series and S Series machines will come set with the Area-based grain loss algorithm as default.

*Area-based loss display algorithm is similar in units of kernels per area. The algorithm considers machine header width, speed, and loss levels. The area based should be the most consistent display algorithm option when harvesting over a range of different speeds and crop conditions.*



## Rotor Loss vs Grain Damage

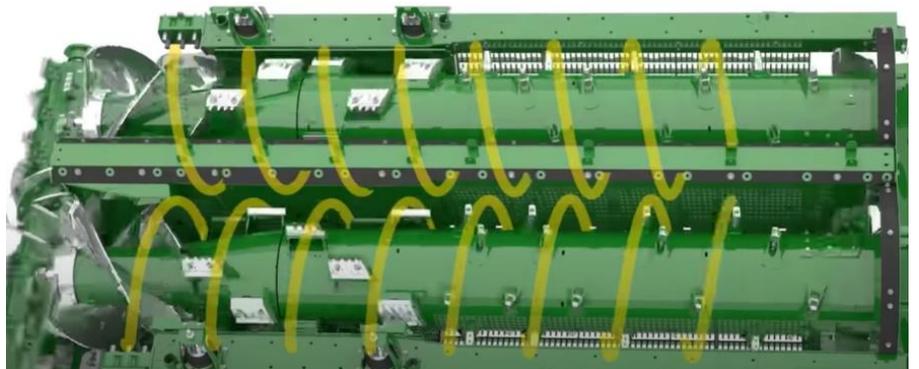
- This graph describes the relationship between rotor loss and grain damage.
- For many years with Walker combines, the theory that threshing cylinder at slow speed as possible gives the best grain quality.
- Today most corn customers run rotor speeds in the 325-350rpm range.
- Starting rotor speed at 400rpm actually lowers rotor grain loss, without increasing grain damage, and also increases separator capacity.



**NOTE:** The graph will shift left and right depending on grain moisture. The recommending rotor speed ranges to harvest in are as follows:

- Wet >25% Moisture Rotor Speed = 360-520rpm
- Dry < 25% Moisture Rotor Speed = 340-480rpm

The 3-stage rotor chamber helps crop expand as it travels through the rotors for improved separation. Slightly faster than traditional rotor speeds are necessary for the X Series as the dual 24in rotors are smaller than the single 30in S Series rotor. The increase in RPM is to match the equivalent rotor tip speed of the Single rotor. With faster speeds, more centrifugal force is applied to the heavier grain. This force helps separate the grain from the MOG as it travels through the rotor cage.



Download the Equipment Plus App for quick information on, settings, grain loss calculator, JDParts, videos, procedures and much more.



Visit the GoHarvest YouTube channel for detailed videos on Power Shutdown procedure, CombineAdvisor, ActiveTerrain Adjustment, and many more.



<https://www.youtube.com/watch?v=3KR77OTdNKU&list=PL1KGsSJ4CWk7jzH744F1bByhwXWAlxmFj>

## NOTES

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