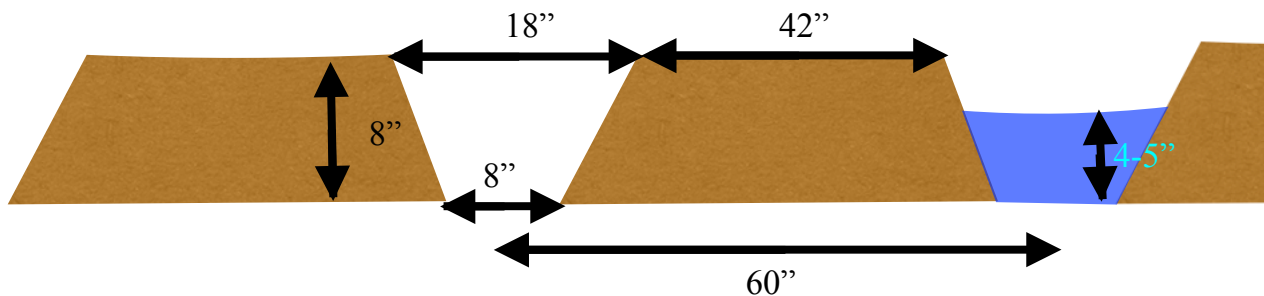


Advisory Paper: Optimizing Tractor Setup for Precision Planting and Bed-Furrow Health



To: Farmer Vasudha & Concerned Farmers

Subject: Tractor HP, Tyre Selection, and Bed-Furrow Management for Precision Planting

1. Understanding Your Current Setup and Goal

You currently have two tractors (Massey Ferguson 58 HP and Mahindra 52 HP), both with 16-inch tyre width. You wish to replace one with a 13-inch tyre to better suit a precision planter and bed-furrow system.

The key is to match tractor power, tyre width, and weight to your bed-furrow profile (42" bed-top, 18" furrow top, 8" bed height, 8" furrow bottom) without causing harmful soil compaction.

2. Recommended Optimum HP for Precision Planter with 13-inch Tyre

For operating a precision planter easily and comfortably on the described bed system:

- A tractor in the range of 45–55 HP is ideal.
Your Mahindra 52 HP (with adjusted tyre width) is already well-suited.
The Massey Ferguson 58 HP is also suitable if weight and tyre placement are correctly managed.
- Why this range?
Precision planters require steadiness, controlled speed, and minimal slippage—not necessarily high power. Excess power without proper tyre matching leads to compaction issues. A 45–55 HP tractor with correct tyre size provides enough traction and control while reducing excessive soil pressure.

3. Critical: Tyre Width and Bed-Furrow Relationship

Your bed-furrow profile has a furrow top of 18 inches and slanted sides.

- Tyre should only use the lower 11 inches of the furrow slant (the lower part of the bed sides).
- Compaction must be limited to 1/3 of the lower bed height to allow water infiltration.
- A 16-inch tyre compacts too much of the furrow side, potentially restricting water seepage into beds.
- A 13-inch tyre fits better within the furrow, concentrates weight on a narrower path, and can reduce sidewall compaction if correctly tracked.
- The best tire size for a 18-inch furrow top and 8-inch bottom is 11 inches.

4. Tractor Adjustments Are Essential

- Wheel track adjustment (54–62 inches, in 4-inch steps) must be set so that rear tires run symmetrically in the furrows, without climbing the beds.
- Front tires should centre the rear tires so that a single track is made.
- Read your operator's manual—it covers track adjustment, tyre ballasting, hydraulic settings (draft/position control), and implement balancing.
- An informed operator is like a skilled gunman—knowledge prevents damage to beds, improves efficiency, and preserves soil health.

5. The Risk of Compaction and Water Seepage Hindrance

If the tyre compresses more than 1/3 of the lower bed slope:

- Soil pores collapse, reducing infiltration.
- Water pools in furrows instead of seeping into beds.
- Root growth and crop health decline.

Therefore:

Choose the tractor whose weight and tyre size best fit the furrow, even if it means keeping the lower HP tractor (52 HP) with 11 or 13-inch tires for planting, and using the higher HP tractor for heavier tillage tasks.

6. Final Recommendation

1. Replace tires on the 52 HP Mahindra with 11-inch width, if this size is not available use 13 inch, for precision planting.
2. Adjust wheel track so tires run centered in furrows, using only the lower 11 inches of the slanted bed sides.
3. Ballast tires appropriately to reduce slippage without increasing compaction.
4. Train the operator on bed-furrow geometry, tyre positioning, and hydraulic control.

This setup will allow comfortable, precise planting while preserving bed structure and water movement.

Thank you for your thoughtful question. Wise adjustment of equipment is the first step toward precision farming and sustainable soil health.

Regards,
Farm Advisory Team

Footnote: Any Production Process That Inundates Soil With Water, Disturbs Soil Through Tillage, Or Leaves Soil Bare Without Organic Mulch Cover Does Not Qualify As Natural Ecosystem Science For Production Agriculture.

PQNK, to be pronounced as 'picnic', which stands for Paedar Qudratti Nizam Kashatqari, and means: the regenerative & sustainable Pristine Organic Farming System.

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