DIY Make a narrow strip rotary hoe cultivator

June 2020

Make a narrow strip rotary hoe cultivator

Allen Dong, I-Tech, PO Box 413, Veneta, OR 97487
http://members.efn.org/~itech

Public domain, no copyright, a gift to humanity

Rotary hoe cultivators are used to uproot weeds at the white root stage before they emerge; loosen surface soil; and break soil capillary water flow to desiccate young shallow rooted weeds. The rotary hoe is pulled at 5 to 15 miles per hour (8 to 24 km/h) and cultivates the width of the implement, 8 to 40 feet (2.4 to 12 m) without regards to crop rows. A narrow version can be made to hoe individual beds without hoeing the tractor wheel row. It is lighter in weight, requires less tractor horsepower and can be used in conjunction with sweeps and chisels to cultivate and hoe in a single pass. When using the narrow strip rotary hoe in conjunction with sweeps and chisel, the tractor ground speed is 2 to 3 miles per hour (3.2 to 4.8 km/h). Dry weather following cultivation with the rotary hoe increases effectiveness of weed control. It is used from 1 week after crop emergence until 4-6 inch crop height.

Here is a design for a 2 feet wide strip rotary hoe cultivator to hoe a bed with 2 rows of beans spaced 11 inches apart. Design can be altered for different bed width.

Cultivating with three 2 feet wide strip rotary hoes, 1 week after bean emergence, to remove spring weeds such as wild radish and smartweed.
Single pass cultivation with mini disk, chisel and sweep in the lead position, followed by rotary hoe.

**Materials for a 2 feet wide strip rotary hoe:**
6 Rotary hoe wheels, 21 inch diameter from [www.ShoupParts.com](http://www.ShoupParts.com), order number SH21 or from [www.sloanex.com](http://www.sloanex.com)

- Shaft for 6 rotary hoe wheels: 5/8 inch diameter x 24 inch length (1.59 x 61 cm)
- Welded frame made from 1 x 2 inch steel tube with 0.120 wall (2.5 x 5 x 0.3 cm):
  - 2 pieces cut to 16 ½ inches (42 cm) for sides
  - 1 piece cut to 21 inches (53 cm) for top
  - 1 piece cut to 13 inches (33 cm) for middle shaft support
- Spacers made from ¾ x 2 ½ inch (1.9 cm x 6.3 cm) pipe inserted into shaft to separate spokes between wheel at 3 ½ inch (8.9 cm) apart
- Steel washers: 5/8 inch diameter placed shaft, between spacer and wheels
- Standards for attaching welded frame to tool bar: 2 pieces of 5/8 x 1 ½ x 10 inches flat steel bar (1.59 x 3.8 x 25 cm)
- Pivot bolts (2) 5/8 inch diameter x 2 1/2 inch (1.9 x 6.3 cm) attaches standards to welded frame
Lift chain: 21 inches (53 cm) made from 3/16 x ½ x 12 inch (0.48 x 1.3 x 30 cm) flat bar and 9 inches (23 cm) of chain to carry the rotary hoe on tool bar hen it is not engaged on soil surface.

Parts for making a 2 feet wide strip rotary hoe: 6 rotary hoe wheels; shaft; welded frame; spacer to separate spokes 3 ½ inches between wheels; standards for attaching the strip rotary hoe to tool bar; lift chain to carry the rotary hoe.

**Construction**

1. Shaft (5/8 inch diameter x 24 inch): drill 3/16 inch holes on each end for cotter pin to lock the shaft in the frame.
2. Frame
   a. Sides (1 x 2 x 16 inch, 0.120 wall steel tube): drill two 5/8 inch diameter holes, centered 1 inch from each ends; one hole for 5/8 inch pivot bolt and one hole for 5/8 inch shaft
   b. Middle support (1 x 2 x 13 inch, 0.120 wall steel tube or 1 x 2 x 13 inch channel): drill 5/8 inch diameter hole centered 1 inch from the end for 5/8 inch diameter shaft
   c. Top (1 x 2 x 21 inches) to be welded on to sides and middle shaft support
d. Welding: insert 5/8 inch shaft into the 5/8 inch hole on side followed by middle support and side. Place the top between the two sides and snug against the middle support. The space between the top tube and shaft should allow free rotation of the 6 rotary hoe wheels on the shaft. Tack weld the sides and middle support to top. Remove shaft then do finally welding of sides, middle support and top.

3. Spacers: cut four 3/4 inch diameter x 2 1/2 inch pipe and two 3/4 inch diameter x 1 inch pipe for spacing 6 rotary hoe wheels in between the welded frame; two 3/4 inch diameter x ~1/2 inch to fill the gap between side of frame and outside wheels.

4. Assemble rotary hoe wheels on to the frame using shaft, spacer and washers. Lock the shaft in place with cotter pins.

5. Standards (5/8 x 1 1/2 x 10 inch flat bar): drill a 5/8 inch diameter hole centered 1 inch from end for 5/8 inch pivot bolt; drill a 5/16 inch diameter hole centered 1/2 inch from the other end for lift chain attachment.

6. Make the lift chain using 3/16 x 1/2 x 12 inch flat bar and 9 inches of chain. The lift chain bolts on to top of standard and bottom of frame.

7. Optional: reinforce the 5/8 inch pivot bolt holes on the side frame with a 5/8 inch diameter x 3/4 inch tubes. Add grease fitting to standard to lubricate the pivot bolt.
Cultivating beans at 6 inch plant height with sweeps, chisels and mini disks in the lead position followed by narrow strip rotary hoe, to remove summer weeds such as amaranth, nightshade, lambs quarter, wild buckwheat and wild millet. The sweeps, chisels and mini disks in lead position loosen soil and allow deeper penetration of rotary hoe spokes.