

Jalko Farm's Bale Tuber



Project Funded by:
Northeast Region SARE

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Jalko Farm's Bale Tuber *NE SARE FNE02-401*

Project Background:

All small farmers face a similar challenge: not spending more on equipment than earned in profit. New wrappers and tubers cost between \$10,000 and \$20,000. Few to no wrappers or tubers are available used. The concept of a silage tuber is simple: push the bale into the tube, seal the ends. With the help of a SARE grant, Ben Albert designed a simple silage tuber that can be made by any small fabrication shop has a welder and basic hydraulics knowledge.

The Design:

There are two basic designs of silage tubers available: cylindrical and armed. The first forces the bag over a large metal cylinder. The bales are inserted into the cylinder. Jalko Farm's design has four hydraulic arms which stretch the bag. A loader pulling on a system of garage door springs and pulleys inserts the bale into the tube.



Fig 1. The hydraulics of a tractor are used to open the arms and stretch the bag.

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Jalko Farm's Tuber has no internal hydraulic pump. Tractor hydraulics are used to open and close the arms (fig 1).



Fig 2. Close-up of the hydraulics.

Hydraulic hoses connect the tops of all the arms, and the bottoms of all the arms. The top hoses close the arms; the bottom hoses open the arms. The first arm connects to the tractor. This has a shut-off valve on the bottom hose (fig 2). The valve locks in the hydraulic fluid in order to keep the arms open while bagging. The tractor may be unhooked once the valve is closed.

Bale Spear/Puller

A combination bale spear and tuber-puller (fig 3) bolts onto the loader. Notice the tab at the bottom of the spear.



Fig 3. Bale spear and tuber puller.

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This increases efficiency. With one smooth effort, the bale is speared and placed on the bale carriage. When backing away from the tuber, the lower tab of the spear is inserted into the triangle (see cover photo). When the triangle is pulled, two things happen: a bar pushes the bale into the bag and the tuber is pulled forward (fig 4).



Fig 4. (1) Loading the bale onto the bale carriage. (2) Inserting tab into triangle. (3) Pulling triangle back, pushing bale into tube. Note the bar pushing on bale.

The final bale has been inserted into the tube. The tuber must now be pulled to the end of the bag. Otherwise, the rest of the bag will be stuck on the last bale. To do this, a 3- foot long piece of wood is wedged

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between the pusher-bar and the bottom of the last bale. The wood is pushed into the tube by pulling on the triangle. This motion also pulls the tuber forward.

The Pulley and Springs

The secret to the success of Jalko Farm's Tuber is the network of pulleys and springs. The pulling action on the triangle is turned into a pushing action onto the bale. Figure 5 - 7 show the pulleys and springs close up. We recommend using more heavy duty pulleys than shown.

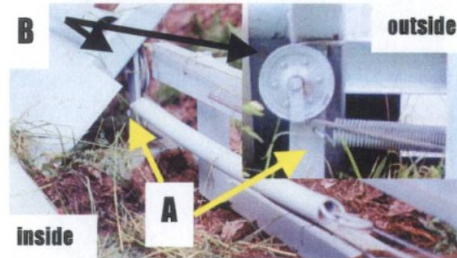


Fig 5. The rear end of the spring (A) is attached to the bale tuber just below the rear pulley (B).



Fig 6. A steel cable runs from the front of the spring, around the front pulley (C), and attaches to the pusher bar (D). A second

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cable also attaches to the pusher bar (E). Note the bent rod which protects the front pulley (F).



Fig 7. The second cable attached to the pusher bar (E in Fig 6) wraps around the rear pulley (B in Fig 5), continues forward, and connects to the pulling triangle (G).

Comparison Info

Table 1. Features of Jalko Farm's Tuber compared with three commercial models.

	Jalko Farm	AgriPac Lastic Tuber 9100	Ag Bag Flex a Tuber	Ag Bag F5401T
Price	\$2,000	\$16,000	\$13,440	\$14,750
Bales / hour	20-30	70-100	50-60	15
How moved	Loader / trailer	Wheeled	Wheeled	Wheeled
Takes Bales > 4 ft diam.	N	Y	Y	N
Engine Type	Tractor	Honda 9HP	6 hp	Tractor
Hydraulic Pump	Tractor	3 gal. at 2800 PSI	Tractor	Tractor
Design Type	Armed	Armed	Armed	Cylinder