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### AIR BAG APPLIES DOWNPRESSURE, ELIMINATES NEED FOR PARALLEL LINKAGE

## New Row Crop Planter Controls Depth With Air

"It completely eliminates the need for parallel linkage which allows the row units to be spaced much closer together than on conventional planters," says Marshall Litchfield, Macomb, Ill., who's developed a new "air pressure" planter that he plans to use to plant soybeans in 10-in. rows.

Litchfield tested his idea for the first time last spring, mounting a 1-row experimental unit on a short length of planter toolbar. Air pressure is used to force the disc openers into the ground as well as to apply pressure to the closing wheels.

"The entire row unit mounts on an up-down suspension system that's shorter and much narrower than parallel linkage bars," says Litchfield. "Each row unit is only 10 in. wide, whereas conventional parallel linkage bar systems are at least 15 in. wide."

Key to the system is a 6-in. dia. "air canister" - the kind used in air bag suspension systems on trucks. The canister mounts directly above the gauge wheels and has an air bag inside that's filled by a pump. The air bag pushes down on a vertical steel rod that's connected to a steel "balance bar" assembly that runs from the gauge wheels all the way back to the "V" closing wheels. A small horizontal bar connects the rod to the disc opener and is hinged at both ends, allowing it to transfer downpressure applied by the rod directly to the disc opener.

The air bag applies a constant amount of downpressure to the entire row unit, just like parallel linkage arms do. The only difference is that there are no downpressure springs and no linkage arms to take up space.

"I used it to plant soybeans and sweet corn this year and it worked good. It will make it possible to plant 10, 20, or 30-in. row crops with the same planter," says Litchfield. "The design might also work on a grain drill. I plan to test it on my 30-ft. drill and use the drill's monitoring system. I think it'll provide much better depth control for narrow row beans than you get with a conventional drill. It does have more moving parts than a conventional

row unit so we'll have to see how well it wears.

"The air bag has about 8 inches of up and down stroke. About three fourths of the downpressure it applies is transferred to the disc opener and the rest to the depth gauge and closing wheels. I use a valve on the pump to adjust air pressure. I usually keep it at about 20 lbs. which generates about 400 lbs. of down pressure.

"I used narrow depth gauge wheels off an old IH planter because they're more sensitive to ground pressure than conventional gauge wheels and don't sink in as deep on soft ground. The depth gauge wheels are connected to the disc opener axle, allowing both the disc opener and depth gauge wheels to move up or down together as one unit. I adjust seed depth by changing the position of the steel bar. One end of it rides in a series of notches on a steel bracket that's connected to the disc opener mounting shaft. With row units spaced only 10 in. apart on a planter there wouldn't be a lot of room to work on anything. However, by raising the strap bar all the way up and tipping the balance bar up I can remove it for easy access.

"One advantage of my system is that it can withstand sideways stress much better than parallel linkage. The rollers mount in a diamond pattern that's offset to the direction of travel in order to equalize the pressure on all of them.

"I run a big, single seed firming wheel ahead of the 'V' closing wheels, instead of a conventional small seed firming wheel. It's less sensitive to variations in down pressure and rolls better in wet soil without dragging."

To build the test unit, Litchfield used the support wheels and 'V' closing wheels off an old Deere corn planter, the seed box off an Allis-Chalmers planter, and the gauge wheels off an International planter.

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Trailer has divided hoppers which allow Henry to haul 350 bu. of wheat seed in one and 10 tons of dry fertilizer in the other. He can haul 670 bu. of grain legally.

### DOUBLE HOPPER TRAILER MADE FROM TWO GRAVITY BOXES

## 5th Wheel "Side Dump" Semi Grain Trailer

"It works great for loading seed and fertilizer into my air seeder and for hauling grain back to the bins," says Dallas Henry, Seneca, S. Dak., about the "side dump" semi grain trailer he built by welding a pair of gravity boxes together.

The trailer has divided hoppers which allow Henry to haul 350 bu. of wheat seed in one and 10 tons of dry fertilizer in the other. At harvest, he can haul 670 bu. of grain legally (total capacity is actually 715 bu.). He uses a 1973 Chevrolet single axle semi truck to pull the trailer, which he built entirely from scratch.

"When I built it I had just bought an air seeder and wanted an efficient way to get both seed and fertilizer out to the field without having to make an extra trip," says Henry. "The side dump chutes work much better for unloading into augers than the center dump chutes on conventional semi trailers. Another advantage is that they're self-cleaning. When I haul grain to the elevator I unbolt the chutes and install home-built ones that direct grain back under the trailer. When planting wheat I mount a seed treater on the side of the trailer so that I can apply liquid inoculant onto the seed as it's loaded into an auger. The seed treater is powered off the semi's 12-volt battery.

Henry used 4 by 8-in. rectangular steel tubing to make the trailer frame and welded a steel plate and kingpin off an old car carrier onto the front of it. The rear axle also came off the car carrier and is equipped with 10.00 by 20 dual truck tires. An axle off a 3/4-ton Ford pickup mounts just ahead of the rear axle and is equipped with 7.50 by 16, 14-ply tires to help distribute the weight. To strengthen the axle he cut the rear end off it and welded a steel pipe in its place. Front and rear fenders were made from 14-gauge sheet metal.

He paid \$650 apiece for new Killbros. 250 bu. gravity boxes. He welded the boxes together end to end, then cut off the other end of each box and used 14-ga. sheet metal to lengthen each end by 3 ft. He also welded 20-in. high strips of 14-gauge sheet metal all along the top of the boxes to increase their capacity. He used 1-in. sq. steel tubing to make a peaked frame that extends above the boxes and supports a manual-crank tarp. Vertical lengths of 2-in. channel iron brace the front and rear sides of the boxes to the trailer frame. A steel ladder mounts between the boxes on the side of the trailer.

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A 6-in. dia. "air canister" mounts directly above gauge wheels and has an air bag inside that's filled by a pump. Air bag applies constant downpressure to entire row unit.