

PART OF THE PAST Harrisburg Area Museum

Focus:2019-7

HAYING-3

Loose hay handling was not very efficient. The internet reports that loose hay takes about 550 cubic feet to the ton. The new “ton” bales take about 200 cubic feet per ton...and that is with straw which is considerably



The Museums 1919 Ann Harbor wire tie stationary baler

lighter than good alfalfa hay. The Museum has an early stationary baler. Loose hay was hand fed into the compression chamber. There a large ‘tamper’ would stuff it down so that the heavy piston could shove it towards the rear where the cage would restrict movement and result in the desired compression. When the desired length was reached a wooden divider would be inserted and a new bale started. Two operators, one on each side, would insert baling wire and one would twist the ends to hold the bale in compressed mode. Sometimes 2 wires and sometimes 3 wires. I think it depended on the size of the bale. This one makes a bale about 18"X22"X4' and would be a 3 wire bale. This job was very dusty/dirty and entailed significant risks. Don't get your hand caught where it shouldn't be! And it required a couple wagons with operators...thus a four man crew. On the farm, we used ‘balin’ wire for about everything! It even made pretty good welding wire for an oxy/acet weld on a car or pickup fender!

In handling the bales we often would just pick the bale up by the wires. But that was hard on the fingers if a lot of bales were to be moved. So for the big job we would use a pair of bale hooks. These worked fine but if

you didn't use gloves your wrists might get scratched pretty badly.



A Hay Hook

After the wire tie baler came the string tie and then round bales were popular in some areas. But here in ‘The Valley’ we didn't make a lot of hay so the baler never was a big item.

Then came the environmental push to stop field burning. What to do with all the straw left after harvest of grass

seed? Field burning started because of an accidental field fire in a Perennial Ryegrass field. Perennial Ryegrass production was experiencing a major problem with poor germination of the seeds. A clue to the cause came when it was discovered that the seed from the accidentally burned field germed OK. Studies then determined that the cause was a tiny toadstool that gave off spores at the same time the Perennial was pollinating. These spores killed the germ. Eliminate the toadstool and you eliminate the germ problem. Since the toadstool grew on the straw from the previous harvest, burn the straw and the problem is eliminated! So burning became THE standard process. That spread quite rapidly to other perennial crops and even to Annual Ryegrass where it was a cheap, fast way to prepare the field for the next crop...and the next crop would out-yield the unburned field. No one had any idea at the time that a market would be developed for straw! But it was...in spades! Today there are about a dozen firms in the valley that bale, store, compress and market some 825,000 tons of straw each year. Most is exported to the near east where animal husbandry is growing rapidly as their culture become beef eaters! They often have an abundant source of protein in the form of fish meal but need fiber for the ruminant animals to chew. An industry was created by a number of good old American Entrepreneurs! It is now a multi-million dollar industry that employs several hundred workers.

These entrepreneurs arrange with the seed producer to, after the seed is harvested, bale, store, compress and ship to consuming areas. The compressed straw is shipped via containers which need to return for a new load of ‘stuff’! A normal baling crew is 2-4 “ton” balers with a rake for each and a stacker for every two.

See below a baler in a field of fescue.



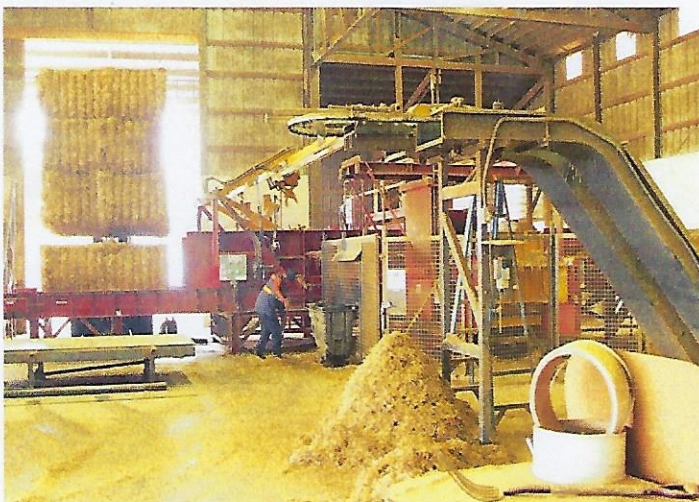
One of many "Ton Balers" at work in a Fescue field.

If everything goes well they can bale and stack 15-25 acres per hour. The bales are 36"X48"X8' long and weigh about 1000#. They are tied with a strong twine. Large trucks, usually 'doubles', haul the bales to storage. Then as needed they are moved to the compressor. See below for the handling on/off the truck. Each bundle contains six



A forklift with squeeze forks unloading a truck

bales and is held on the forklift by squeeze arms. The arms do not go under the bundle, just squeeze the lowest layer and lift.



Six bale load in doorway at start of compressor line

The compressor is a complex machine with most functions fully automated. The whole machine is about 100' long. This one is manufactured in Canada...About \$1,700,000!.

The bales are brought to the compressor where they are moved through the multiple steps till they come out as a plastic wrapped bundle of compressed chunks!

The steps (all automatic) include these: (1) Removal of strings; (2) slicing



through the *The strapping section. Just past the middle in the compressor* both

horizontal and vertical directions (Bale is quartered); (3) quartered bales are separated and each segment is compressed to about 1/2 size; (4) the segments are banded with plastic tape; (5) the compressed segment is then sliced



into 4 pieces for easier handling (see below); (6) a number of the sliced segments are bundled together and plastic wrapped for shipment as a 4'X4'X4' bundle of 64 cubic feet weighing 1500#

Wrapped Segments

(85 cubic feet per ton compared to 550 loose and 200 in big bale) Each small segment weighs about 55# (25 kilograms). It is compressed so tight the end of the bundle looks almost like wood. See picture above..



The segment cut into 4 pcs.

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Compressor pictures courtesy of Valley Hay and the Derstine family.

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