Observations (as of Feb 2018)

Density – It appears that this design **is** capable of producing high density bales. The 1/3 scale model has made 13 pound per cubic foot bales (equal to a 71 pound 14" x 18" x 37" bale) driven by a ¾ horsepower sewing machine motor, and held together with ¼ inch tie rods. This is twice the density of balsa wood. Heavier materials and higher horsepower should be able to produce export density bales (25 pounds per cubic foot), nearly the density of pine boards. By far the largest power requirement will be the cutting mechanism that will cut the bales to size.

Capacity – The capacity of this design baler will be limited only by the power and speed of the bale sizing cutter. The smaller the finished bale, the faster the cutter will have to cycle. Conversely, the larger the cross section of the bale, the longer it will take for a knife to cut the bale, but assumedly it will take longer to produce a bale that needs to be cut, thus allowing more time for the cutter to travel and cut the bale. For example, if a 56 pound bale (14" x 18" x 36" @ 10.7 pounds per cubic foot) could be cut every second, the theoretical capacity of such a baler would be 100 tons per hour. Put another way, one could bale 3 ton per acre hay at 5 miles per hour with a 55 foot header, like harvesting soybeans! By comparison, a conventional small square baler running at 90 strokes per minute (1.5 cycles per second), compressing 3.7 pounds per stroke, theoretically produces 10 tons per hour. That would be a 15 flake, 55.5 pound bale every 10 seconds. In any case, the compressing of the hay is accomplished in a continuous flow and will limited only by design considerations regarding the cutting mechanism.

Knotters – Not! Removing twine knotting or plastic strapping sealing from the baling process is a huge improvement. Gone are timing issues and all the little parts that wear out or become misaligned in conventional square baler knotters, causing untold lost man-hours and machine downtime, resulting in diminished quality or lost production. At this time packaging options appear to be net-wrap, perforated stretch wrap, or solid stretch wrap. Already companies are offering to develop 'whatever it takes' to contain these bales. In order to contain a bale, it would have to be wrapped on four sides, but further development could incorporate wrapping on all six sides to produce a totally sealed package, possibly addressing some of the requirements of the Food Safety Modernization Act (FSMA) and being more consumer friendly.

Bale Size – Even though the current machine was supposed to be a 1/3 scale model of a 14" x 18" x 37" (horse hay) baler, there has been a large amount of interest in it 'as-it-is' for making pet food size bales. Along with those two sizes, it could also be designed to produce export sized bales right in the field, eliminating the need to reprocess big square bales into the high density bales for export. But maybe most interesting, considering that the bales could be wrapped the same as round bales, this baler could be designed to produce a 4' x 4' x 4' bale with all the advantages of a round baler without the disadvantages, such as a shape that is hard to handle, and the need to stop while the bale is wrapped.