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Portfolio

Here I have attached a portfolio of my engineering work in the ag industry outside of my NDA IP projects. Working at Scipio Springs Dairy I have completed many unique projects with my welding and engineering skills. When I'm not found in the tractor cab my employer has recognized my unique skills behind a welding mask with a talent for fabrication. I have included just a few of the projects I have completed during my employment here.

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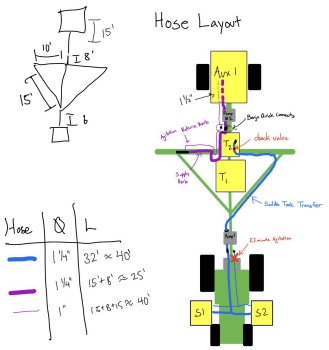
1. **Corn Planter Addition of Fertilizer Cart - 2024**
   During my Winter and Spring breaks in 23-24, I undertook a project at Scipio Springs Dairy to enhance their planting operations. They had recently acquired a Yetter all-steer fertilizer cart to augment their planter's capacity and streamline planting processes. The existing setup included a John Deere 16-row 30-inch 1775NT planter equipped with three product application systems: fertilizer openers, in-furrow, and a standalone herbicide system. The herbicide system was originally fed by saddle tanks mounted on the tractor.

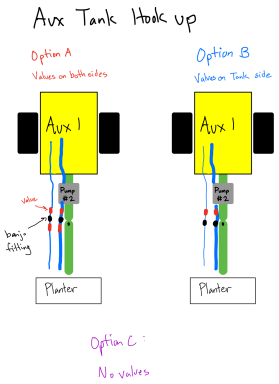
   My task was to set up the barebones fertilizer cart to pump onto the planter for the herbicide spray system. Additionally, I needed to reconfigure the planter to utilize saddle tanks for transferring to the smaller rear tank during planting, optimizing capacity. Lastly, I aimed to establish an easy hookup/disconnect system in the rear, incorporating auxiliary fill lines.

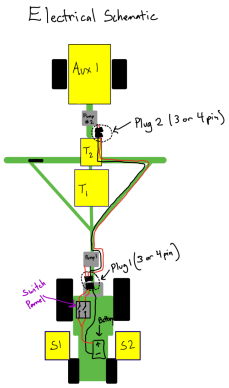
   To accomplish this, I applied principles of fluid mechanics, employed wiring expertise, and utilized welding and fabrication skills to craft pump mounts and hose brackets. I designed a filling system and installed two 12-volt pumps wired to switches in the cab for operational control. Leveraging my 3D printer, I created a custom toggle switch panel for enhanced functionality in the cab.

   Overall, this project allowed me to leverage my engineering skills to enhance efficiency and productivity at the dairy farm while demonstrating a commitment to giving back to a significant part of my high school experience.

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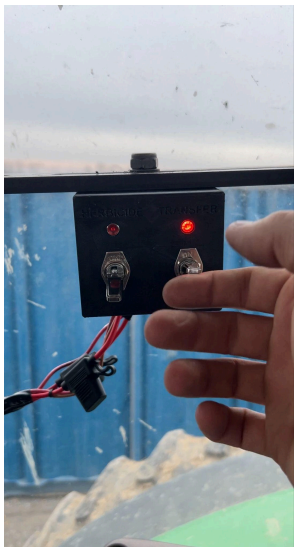


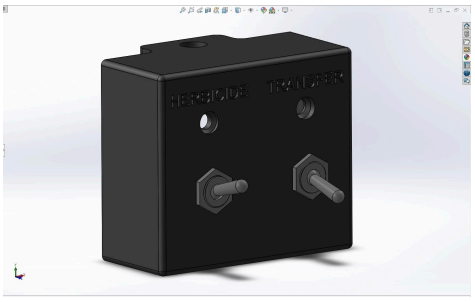




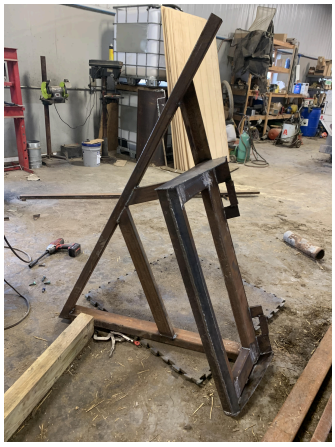








2. **Skid Steer Feed-pusher-2021**
   Redesign of original bucket-style feed pusher that kept on breaking due to wear plate design flaws. Used advanced drawing and CAD software to build a quick-attach plate from raw steel. Worked with Auburn Tank LLC to design blade face with break feature. Designed so that the blade rides level and doesn't dig into the floor when the skid steer is in a lowered position. Additionally designed bolt-on steel wear plates to increase the longevity of the blade. Used knowledge from relevant coursework so that frame design was optimized for Stress.






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3. **Side Dresser Version 2.0-2020**
   A redesign and improvement of my original homemade drop tube side dresser. My boss entrusted me with fabricating on a brand new y-drop side dresser adding on a spot sprayer that used the tractor's saddle tanks to help fight nutsedge weeds. Also re-engineered a custom y-drop for the guess rows so fertilizer rates were not half rates on one side of the plant, improving upon the original fertilizer toolbar design. Reprogrammed to GPS with RAVEN controller so the fertilizer rates ran off of radar on

the tractor. I then was able to successfully side-dress 1400 acres of corn using this rig without a single issue with the redesign and new sprayer bar.






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4. **Welding Truck-2020**
   Designed a universal frame for flatbed and built custom bumper from scratch capable of pulling 17,000lbs as seen below






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5. **Fuel Pipe-2020**
   Engineered fuel pipe mounts so that fuel line would be 6” within containment device when trucks were loading tank to comply with fire code. Fabricated fuel pipe mounts to

relocate pipe within the diesel containment device. The unique design required no drilling into concrete so that it would stay up to code with the galloon containment amount exceeding the tank capacity. (Showing off the fitment and some dimes in the second picture).





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6. **Cattle Chute-2019**
   My biggest project by far. I designed a chute to turn cows around before they entered a trim table, conducted a meeting with a hoof trimmer, placed new poles in concrete, and sourced all materials on my own. To help with painting and small details I managed a co-worker. Some unique features of this project are the shape of the chute I designed that perfectly turns a cow with no sharp corners and a fake swinging wall for the safety of whoever is pushing cattle to step through, it operates in both directions as a saloon-style door. This system has been working very effectively for 6 months now. My inspiration for the design came from a tour of Spruce Haven's Dairy where I went to start my initial drawings.







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7. **Water Sprinkler-2018**
   My first welding project on my own. Built elevated rail to maximize water sprayer system to cool off cows during summer. Prioritized fresh groups with flow rate to maximize milk production in July and August.



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8. **Calf Sequencing Pens-2018**
   Built and designed calf pens to move growing cattle quickly and efficiently. Transitioning them from hutches to barns. Built a separated barrier for cleanliness with straw.



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9. **Side Dresser-2019**
   I retrofitted a century sprayer with drop tubes to side-dress corn. I had to redesign the sprayer system with a metal impeller to push thick nitan and relocate hoses. Saved farm an estimated $16,000 in fertilizer costs by building this. We were able to do 40% of our own side dressing in 2019. I was the lead applicator with my system and got it dialed in to 35-40 gal/acre. The effectiveness of drop-tubing precision placing produced extremely high-yielding corn.

