**Issues**

**Power:**

1. Charge controller:
   1. When drops below ~10.5V, load output stops. When voltage increases to ~12V, load output turns back on.

**Board setup:**

1. “Radio Failed”
2. “SD initialization failed”
3. Board deletes all synced clients
4. When client or server doesn’t sync, problem is usually with Moteino

**Communication:**

1. If one client fails, server does not receive data from any proceeding clients in that transmission
2. If client fails or is removed, but still synced to server, server will not receive data from proceeding clients
3. Clients only send data for a day or two before they stop working

**Moteino pieces:**

1. Work well! Unless you burn them…
2. A few older Moteinos got hot when properly connected and burned themselves out (fatigue?)

**Structure:**

1. Main PVC mast is too tall to easily reach and adjust canopy sensor
2. Canopy arm is a little bit difficult to raise (due to weight of arm, height of pivot point)
3. Canopy arm came out of socket too easily (put screws in to keep from coming out, but one structure even pulled the screw out)
4. Canopy arm is very flimsy (¾” PVC) and bends a lot when the wind blows
5. Snake sensor can move away from leaf if coil is too loose
6. Structure twisted at soil sensor PVC junction (put screws in to keep from twisting)

**Setup/Assembly:**

1. Many pieces to cut/make (metal poles, PVC, green stakes, sensors…)
2. Sensors: time consuming to make (soldering, silicone, epoxy) and once made, they are permanently set
3. Was difficult to replicate drilled holes on “pivot PVC” even with a template
4. Screws to hold on green stakes had to be carefully screwed in, one at a time otherwise they would spin in place and a new hole would have to be made. (The metal pole inside prevented screw from going in farther)
5. Green stakes were time consuming to bend

**Installation:**

1. Time consuming and many pieces to keep track of
2. Very difficult once corn is taller than 3-4 ft

**Things we learned**

1. Put together all pieces first, THEN bring out to field (can have a more efficient “assembly line” style assembly. Keep better track of pieces and tools. Stay cooler.)
2. Drill auger hole FIRST (even if only have a smaller auger for the drill) then use correct, larger size auger
3. CHECK RTC BATTERY BEFORE FIELD INSTALLATION
4. If no power or sensor not reading, first thing to try is using the black connector tool to push wire back in

**Suggestions for next year**

**Power:**

**Communication:**

**Structure:**

1. Smaller diameter loom (will allow for a tighter coil around corn plant)
2. Structural design that will allow canopy sensor to be raised and lowered vertically instead of rotated (see green journal “2018-2019 IRT” page dated 7/26/19 for diagram)
3. Instead of green stakes, use a PVC attachment and another shallow hole to prevent structure from rotating (fewer pieces to assemble, no need for screws) (see green journal “2018-2019 IRT” page dated 7/26/19 for diagram)

**Setup/Assembly:**

1. Would suggest using PVC as a template instead of a rubber template for drilling holes in curved PVC pivot

**Installation:**

1. Put together all pieces first, THEN bring out to field (can have a more efficient “assembly line” style assembly. Keep better track of pieces and tools. Stay cooler.)

**Questions we still have**

1. Why are the clients only communicating for a day or two? (Why do they fail after this time?)
2. When we try to sync clients to the server, why can’t we do an easy sync for most, and then a manual sync for just one?
3. Why did server forget all clients synced to it when installed in field? (Clients continued working and collecting data though)

**Next steps**

1. Maintenance - raise canopy arms, ensure snake sensors properly positioned, ensure area below soil sensor is clear of debris
2. Add antennas to all clients/servers
3. Try different antennas?
4. Continue adjusting sketch
5. Identify trends in which boards work (connected to same power? Have antenna?)