



## 2020 Potato Variety Trial Results

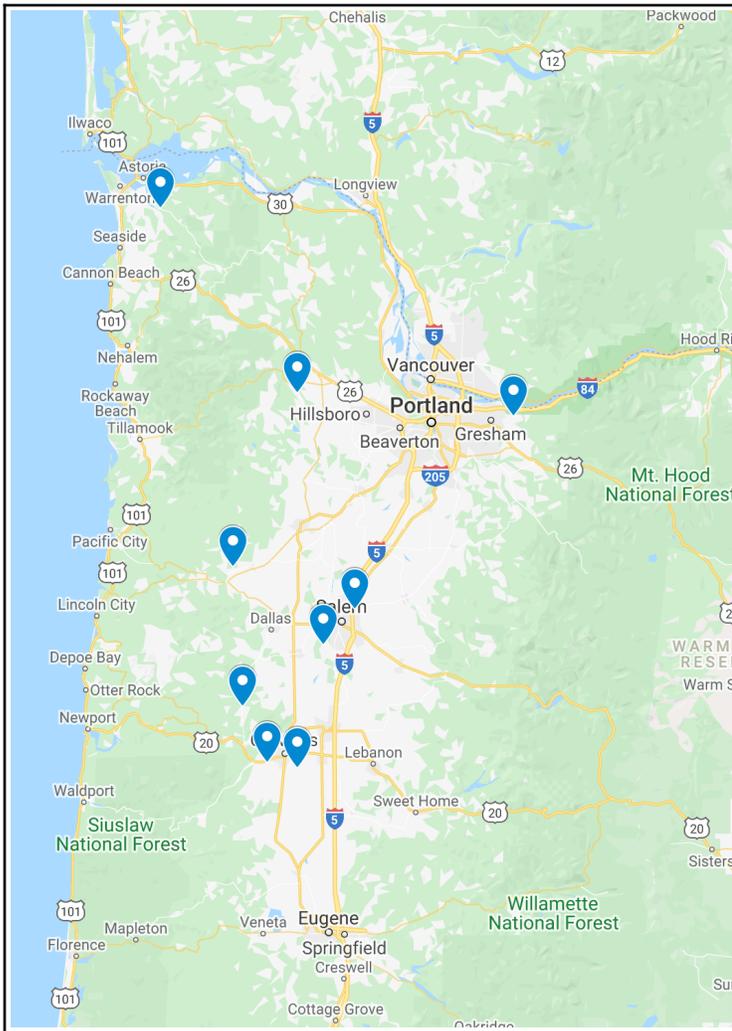
*Contributors: Chris Homanics (Head, Hands and Heart Nursery), Amy Garrett and Lucas Nebert (OSU)*

### Important Takeaways

Many trial sites observed significant gopher and vole predation. While Caribe and Belmonda were highest yielding and two of the earliest to mature, we did not find as strong of a correlation between days-to-maturity and yield as we did in 2019. Further, Papa Cacho was one of the latest to mature and yet lowest yielding overall. We chose not to include data from our storage trial as we had excessive humidity and poor storage conditions which likely skewed our results by causing premature sprouting of tubers.

We are finding sourcing targeted varieties from year-to-year, especially organic, to be difficult and in several cases impossible. For instance, we were unable to obtain 'Lilly', 'Ozette', and 'Purple Peruvian'. Several factors are at play including changing grower preferences, a certified potato industry in a state of flux, and an industry which appears to be switching more acreage back to conventional management to meet increased demand for seed stock caused by the pandemic. In addition, while 'Purple Abundance' (a non-commercial release from Chris Homanics) was among our top performers in 2019, we have chosen to only include certified seed stock in our trials in an effort to better control variables. These factors and general quality issues with organic potato seed has led to discussions around forming the opportunity for a regional certified seed potato company.

### Dry Farming Collaborative Potato Trial Sites



#### *Special thanks to:*

- **46N Farm** - Teresa Retzlaff
- **Christina Bose and Mike Rubin**
- **Gales Meadow Farm** - Anne Berblinger
- **Goosefoot Farm** - Marshall Haueter
- **Marion Polk Food Share Youth Farm** - Jared Hibbard-Swanson and Emily Griffith
- **Peoria Gardens** - Kathryn Weeks and Ben Verhoeven
- **Sunbow Farm** - Yadira Ruiz and Nate Johnson
- **Valley Creek Solar Farm** - NREL & Carolina Solar
- **Wild Roots Farm** - Mary Colombo



**Part of our potato seed purchase sponsored by DFI**

## Dry Farming Collaborative Potato Varieties Tried

There were several commercial varieties we wished to continue from our 2019 dry farm potato trials including Ciklimen, German Butterball, Lilly, and Purple Peruvian, and Red Pontiac. While Lilly and Purple Peruvian were not available commercially, we were able to procure some saved-seed through members of the DFC from the previous year. These varieties were included on a couple of isolated sites in 2020.

| Code | Earliness | Variety Name      | Tuber Type        | Description/Use  | Avg. Yield per Plant (lbs) | Number of Sites | Resistances                                      | Source            |
|------|-----------|-------------------|-------------------|--|----------------------------|-----------------|--|-------------------|
| CB   | Early     | Caribe            | R/W               | Canada, 1984. Known to be resistant to drought. Sets large potatoes.   | 2.92                       | 4               | Scab   | Maine Potato Lady |
| CL   | Early     | Carola            | Y/Y               | Germany, 1979. Creamy texture. somewhat waxy.  | 3.11                       | 3               | Blackleg, PVA, PVY, PLRV, Scab                   | New Sprout Farms  |
| BE   | Mid       | Belmonda          | Y/Y               | Germany, 2016. All-purpose. Known for superior storage traits.   | 3.11                       | 3               | Blackleg, early blight, late blight, rhizoctonia | Maine Potato Lady |
| CI   | Mid       | Ciklamen          | R/W               | Hungary, 1988. Boiled, steamed, creamy texture   | 2.32                       | 3               | Black leg, scab, PVY                             | Grand Teton       |
| DE   | Mid       | Desiree           | R/Y               | Netherlands, 1962. All-purpose. Mix of floury and waxy texture.  | 2.95                       | 6               | Black leg, dry rot, late blight, PVA, PVY, PVX   | New Sprout Farms  |
| RP   | Mid       | Red Pontiac       | R/W               | Florida, 1947. Katahdin x Bliss Triumph. All-purpose, especially mashed.                                     | 2.05                       | 3               | Blackleg, tuber necrosis                         | New Sprout Farms  |
| FF   | Late      | French Fingerling | R/Y-R, fingerling | France, 1950. All-purpose, smooth creamy texture, floury.  | 2.52                       | 6               | Scab   | Grand Teton       |
| GB   | Late      | German Butterball | Y/Y               | Idaho, 1988. All-purpose, buttery flavor, large starch grains russet-like                                    | 2.76                       | 5               | Late blight, scab                                | Grand Teton       |
| PC   | Late      | Papa Cacho        | R/W-R, fingerling | Chilean landrace. Named Cow Horn Potato. Roast or boil.  | 1.25                       | 6               | Late blight                                      | Maine Potato Lady |
| PG   | Late      | Pinto Gold        | R-Y/Y             | U of Maine, 2014. All-purpose. Mild flavor, creamy texture, somewhat waxy. Typically smaller sized potatoes. | 2.77                       | 4               | Late blight, scab                                | Maine Potato Lady |

## Trial Participants

This season DFC Potato Variety Trials had eight participating sites. However, not all potato varieties were grown at each site. Three sites were managed by OSU (Peoria, Sunbow, Valley Creek). Additional participating sites were 46 North Farm, Gales Meadow Farm, Goosefoot Farm, Marion Polk Food Share Youth Farm, Mike & Christina Rubin's farm, and Wild Roots Farm.

## Planting Protocol

- Three replications of each variety were planted and randomized within the trial plot. A replication was considered to be 10 tubers spaced at 2' apart in a furrow and uniformly covered with several inches of soil. Between-row spacing was set at a minimum of 3' or greater, based on-site equipment.
- Field planting was to be completed on the same day between mid-April and mid-May. Plot was physically labeled and a field plot map was drawn.

## Management Protocol

- Potatoes were hilled at about 1' tall and again if the grower had time later in the season.
- Planting was encouraged to be done early enough when there was still adequate soil moisture. Irrigation was acceptable for a later planting if soil was excessively dry. No further irrigation was permitted to accurately assess suitability for dry farming.
- For each particular variety, potatoes were harvested as soon as the plants were mostly yellow/brown. Trial site participants made a qualitative assessment of when varieties were "ready".

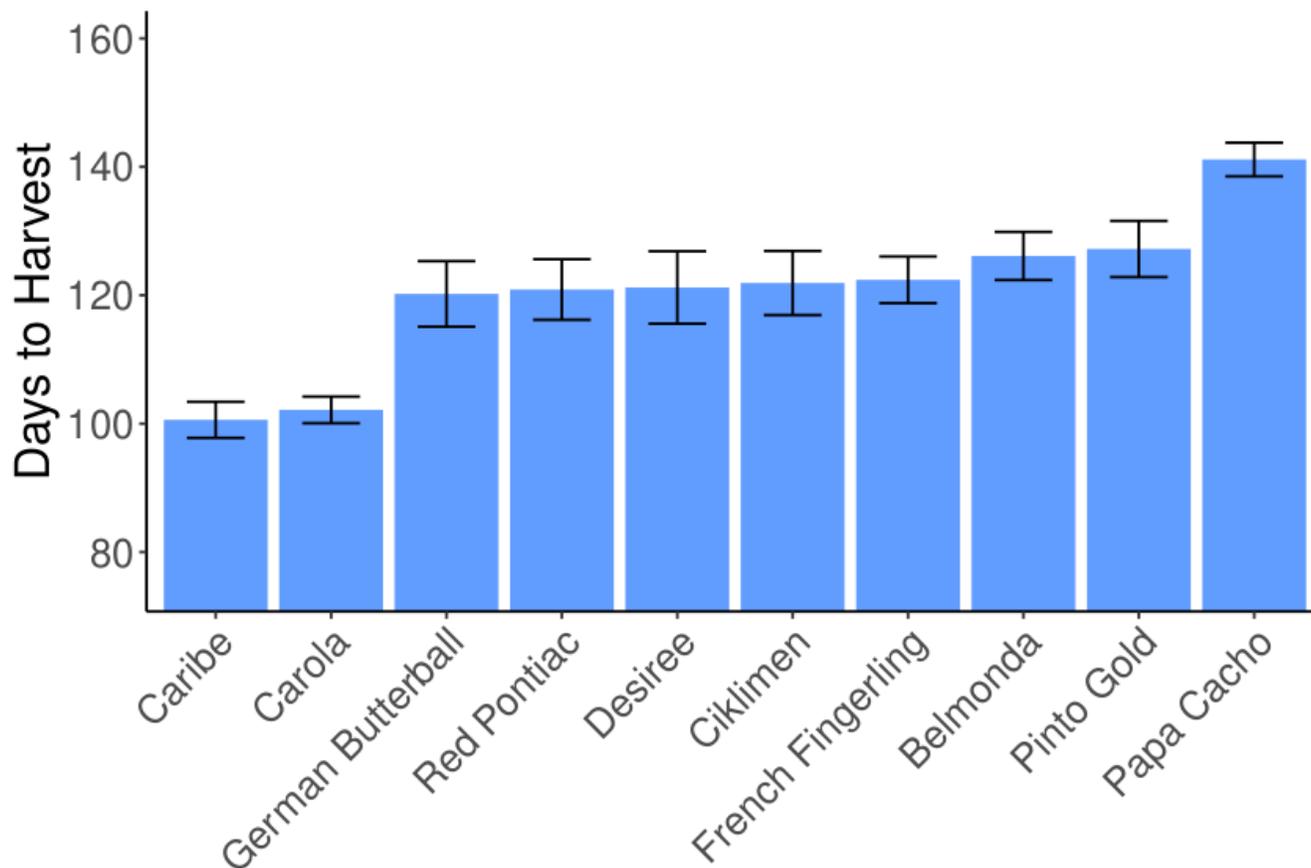
## Qualitative Observations

There was heavy vole and gopher pressure during the 2020 growing season. It is hard to say whether there was preference for certain varieties or simply some hills were opportunistically predated when "discovered". Highlighting yield and performance differences between sites, Papa Cacho overall was a poor performer in the hot, dry conditions of Oregon's Willamette Valley. However, a site on the Oregon coast saw Papa Cacho as a near top-performer in terms of yield.



## Days To Maturity

As outlined in the above table, potato varieties are roughly classified into three ripening windows: early, mid, as late.



## Potato Yield Comparisons

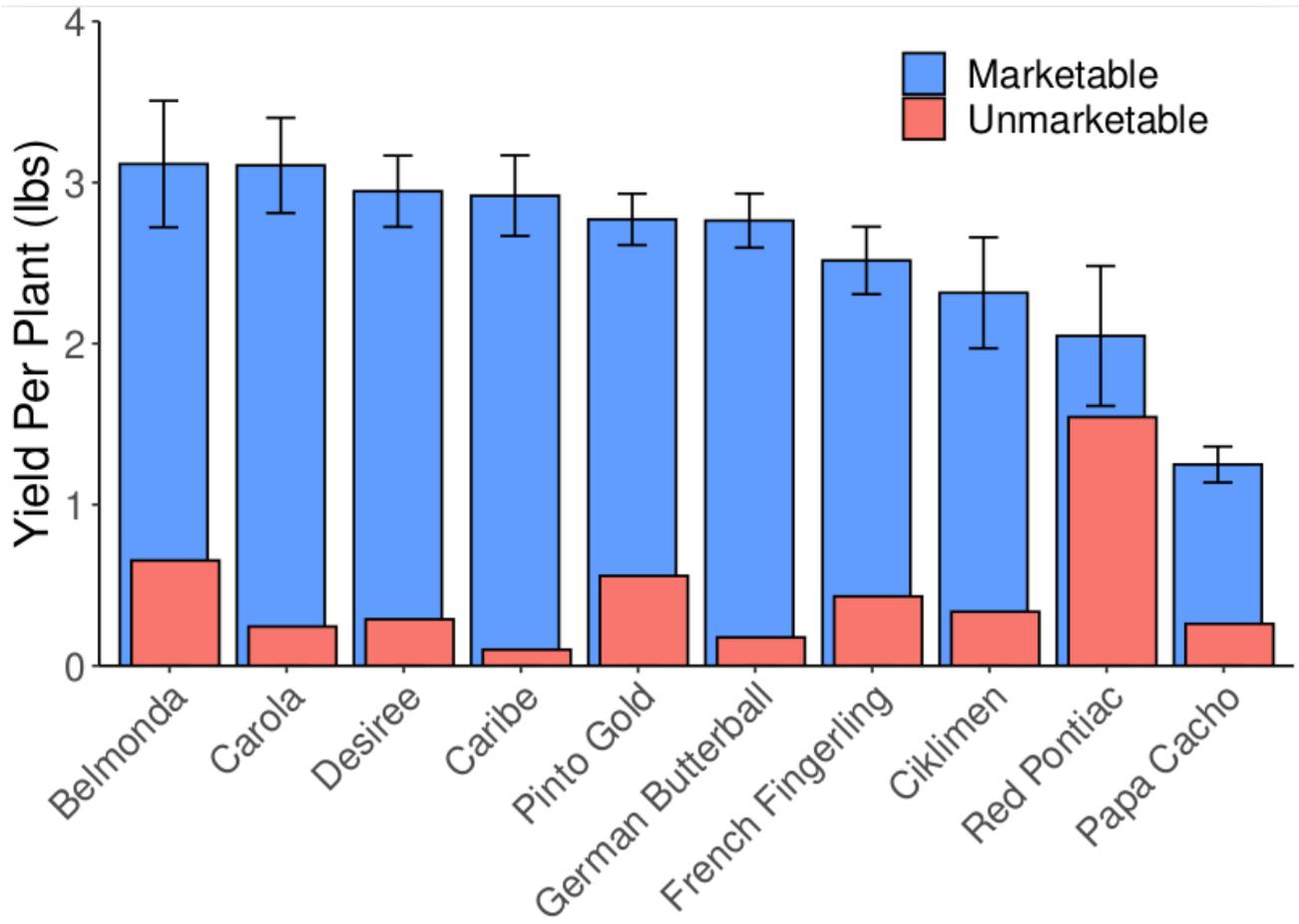
As potato varieties were not equally represented across all sites, we opted to compare yields based on linear models that accounted for site effects. Belmonda and Carola tied for top production. Based on consistently low yields, Papa Cacho was clearly unadapted to Willamette Valley conditions. A significant factor contributing to unmarketable yields at most sites was gopher and vole predation. Unmarketable yield of Red Pontiac was largely due to scab.

Purple Peruvian, Purple Abundance, and Lilly were grown on two isolated sites from saved seed contributing to 2019 and 2020 yield comparisons.

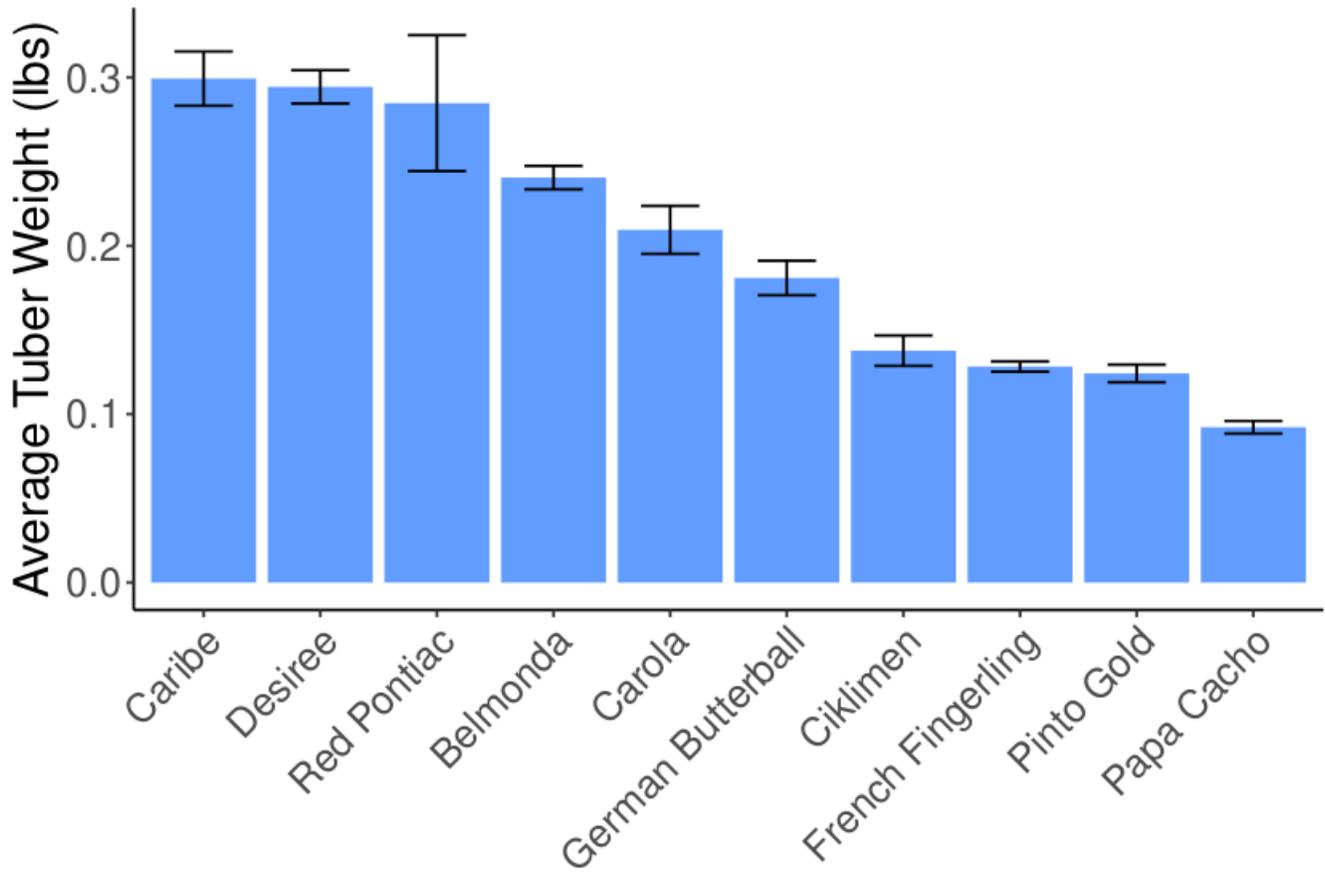
For reference, you can refer to our 2019 Potato Variety Trial Results:

[https://smallfarms.oregonstate.edu/sites/agscid7/files/potato\\_variety\\_handout.pdf](https://smallfarms.oregonstate.edu/sites/agscid7/files/potato_variety_handout.pdf)

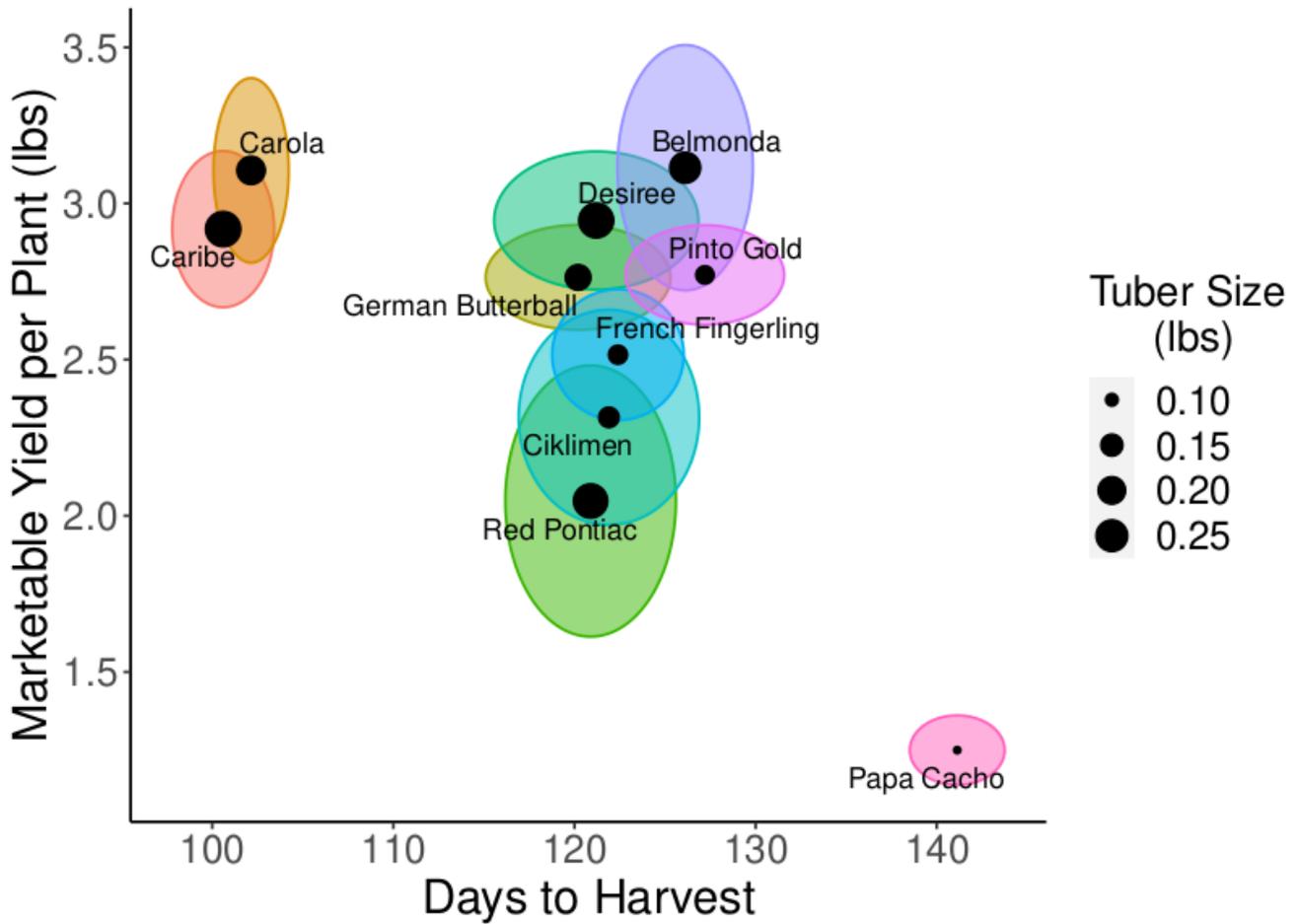
## 2020 Potato Yield Summary



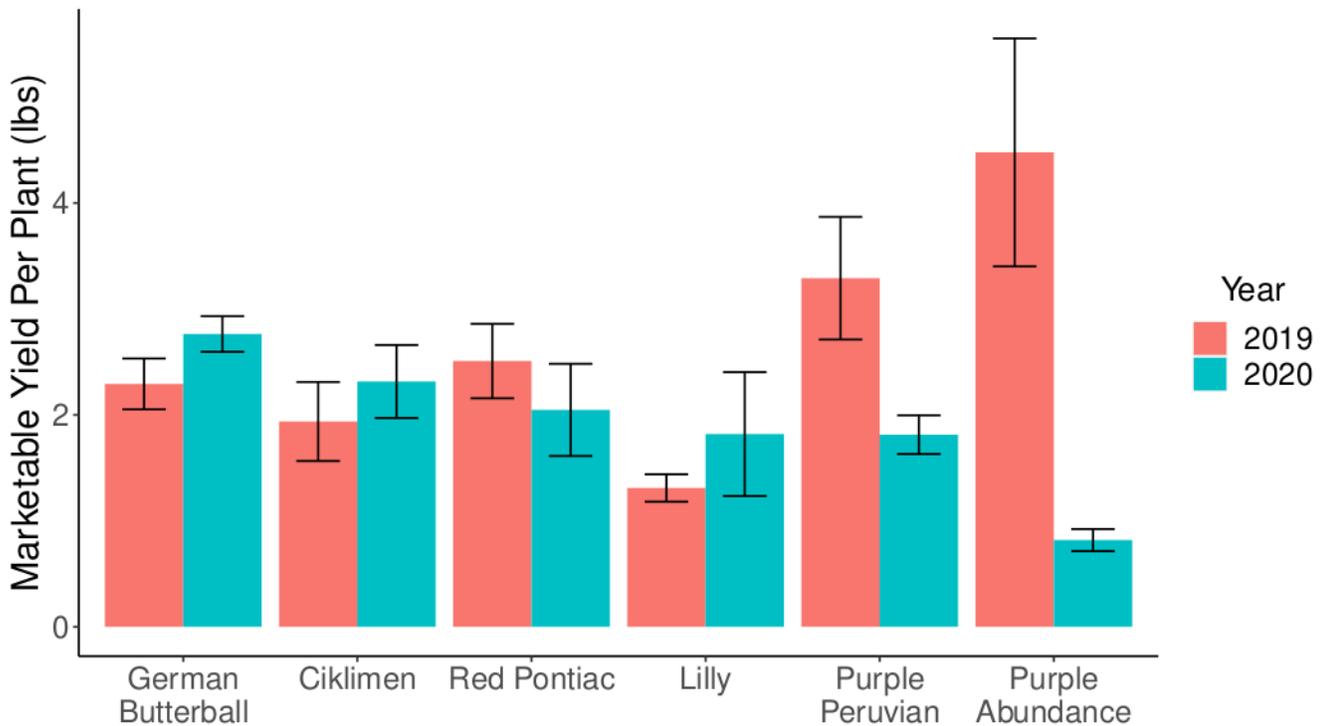
## Tuber Size



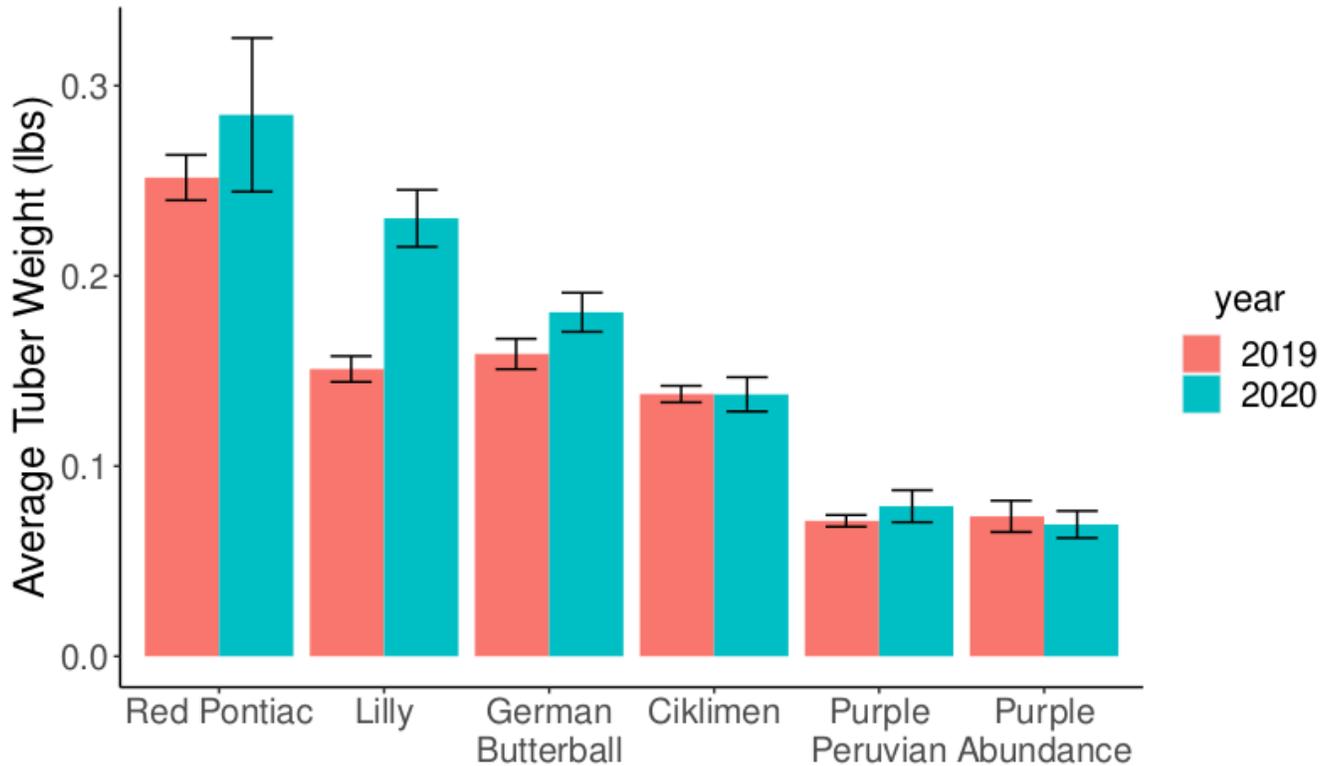
**Graphical Summary of Potato Varieties**



**Yield Comparison Between 2019 and 2020**



***Tuber Size Comparisons Between 2019 and 2020***



## **Discussion**

### ***Site and variety effects***

Papa Cacho was much more productive in cool coastal conditions than the hotter, drier conditions of Oregon's Willamette Valley. While geographically close, microclimates between sites differ greatly. It is important to note that selecting suitable varieties for dry farming is very site specific and what performs well on one site may not perform well on another.

The extreme yield difference between 2019 and 2020 for Purple Abundance and Purple Peruvian are likely due to switching sites. The 2019 site was an organically managed Chehalis silt loam and the 2020 site was a conventionally managed (Dayton and Woodburn series) site with low fertility. This extreme difference highlights the importance of evaluating site suitability.

### ***Improving methodology over time***

Participatory research in agriculture is complex and the data can have a lot of noise in it. In future years, we endeavor to increase accuracy for both yield and days-to-harvest data by improving our methodology to better control for these variables. Predation by voles and gophers had a significant impact on yield, but it is impossible to quantify exact numbers. Better documentation of predation across all sites would help improve accuracy alone. Standardizing harvest protocols around what qualifies as a mature harvestable potato plant will improve days-to-maturity data.

Finally, increasing the number of varieties in our yearly trial and especially from year-to-year will allow us to collect finer grained data over time as well as improve our discovery rate of which varieties are well-adapted to dry farming conditions. Both procuring greater funding for this project as well as improving access to certified seed lots of more varieties will be necessary to achieve these goals.