CONTINUING REPORT   **DURATION**: 2 Years

Project Title: A database to aggregate research results and assess technologies

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Cooperators:

Tom Auvil, WTFRC   Kate Evans, Washington State University
Tory Schmidt, WTFRC   Dorrie Main, Washington State University
Ines Hanrahan, WTFRC   Lynn Long, Oregon State University
                                   Matt Whiting, Washington State University

Total Project Request: **Year 1:** $9,078   **Year 2:** $1,000

WTFRC Collaborative expenses:

Item	2008	2009	
Stemilt RCA room rental			
Crew labor			
Shipping			
Supplies			
Travel			
Miscellaneous			
Consultation time[1]	2665		
Total			

Footnotes:

1. Approximately 100 hours to aggregate, explain, and transfer existing datasets from Tom, Tory and Ines.

Budget 1:

Total Project Funding: $10,078

Budget History:

Item	(2008)	(2009)
Salaries		
Benefits		
Wages	$2605.38[1]	~$400[1]
Benefits	$235.11	~$40
Equipment		
Supplies		
Travel	$60.42	
Miscellaneous		
Database development [2]	$2000	
Database refinement		$500
Total (~$5841)	$4900.91	~$940[3]

Footnotes:
1. In 2008, salary for one full time summer person to assist with database entry and surveying. In 2009, salary is estimated because it has not finalized in the WSU system at the time the report was due.
2. Computer programming of the initial database will be contracted to specialists within WSU.
3. This is an estimated total because of the salary estimation.

Objectives:
1. Develop a searchable database that will capture rootstock-variety combinations for apples and cherries, as well as varietal characteristics, management practices, and environmental factors.
2. Aggregate data from existing sources (i.e. projects with OSU, WSU, WTFRC) on rootstock/variety trials and replant practices.
3. Publish to the web.
4. Generate reports and analyses to assist collaborators in assessing replant practices and the effects of management practices on production of targeted fruit.
5. Assess the status of the database and identify gaps where incorporation of new variables would assist in development of targeted fruit production.

Significant Findings and Accomplishments:

- We designed and vetted the architecture of the Orchard Conditions Database (OCD) that can be easily transferred to other systems.
- We created an online searchable database that has the capability to capture a wide breadth of information and linked with AgWeatherNet data.
- Relevant rootstock and variety data has been organized and entered for WTFRC, WSU Cherry Breeding Program, OSU Cherry research and most of WSU Apple Breeding Program.
- Despite the volumes of data entered, much of it is incomplete. Because of constraints of the previous research and lack of a place to aggregate data, some fields (i.e. yield, fertility program, etc.) were not always captured. This will improve with the collaboration of breeding programs and WTFRC.
- We will continue work and expand on the database through an SCRI grant on "Tree Fruit GDR: Translating Genomics into Advances in Horticulture" (PI Dorrie Main).

Results and Discussion:

As in any database, the first step was to create the architecture of the data. Our structure consists of 11 tables and 108 potential variables (Fig. 1). Both the structure and variables have been vetted by potential users and WTFRC. This systems was designed to be easily transferred to other entities or expand to incorporate other commodities.

The online database has 6 main links—home, basic search, advanced search, variety information, rootstock information, and administration page (Fig. 2).
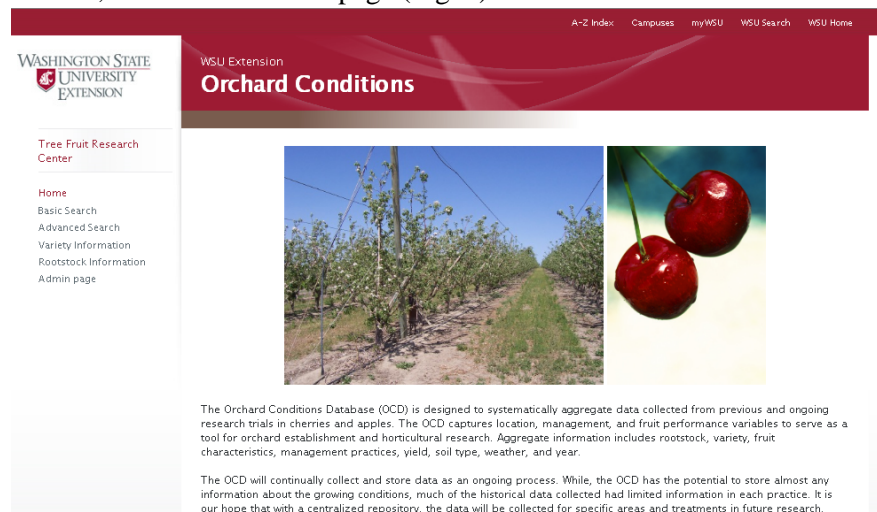

Figure 2: Home page of Orchard Conditions Database. Shows an overview and 6 main links.
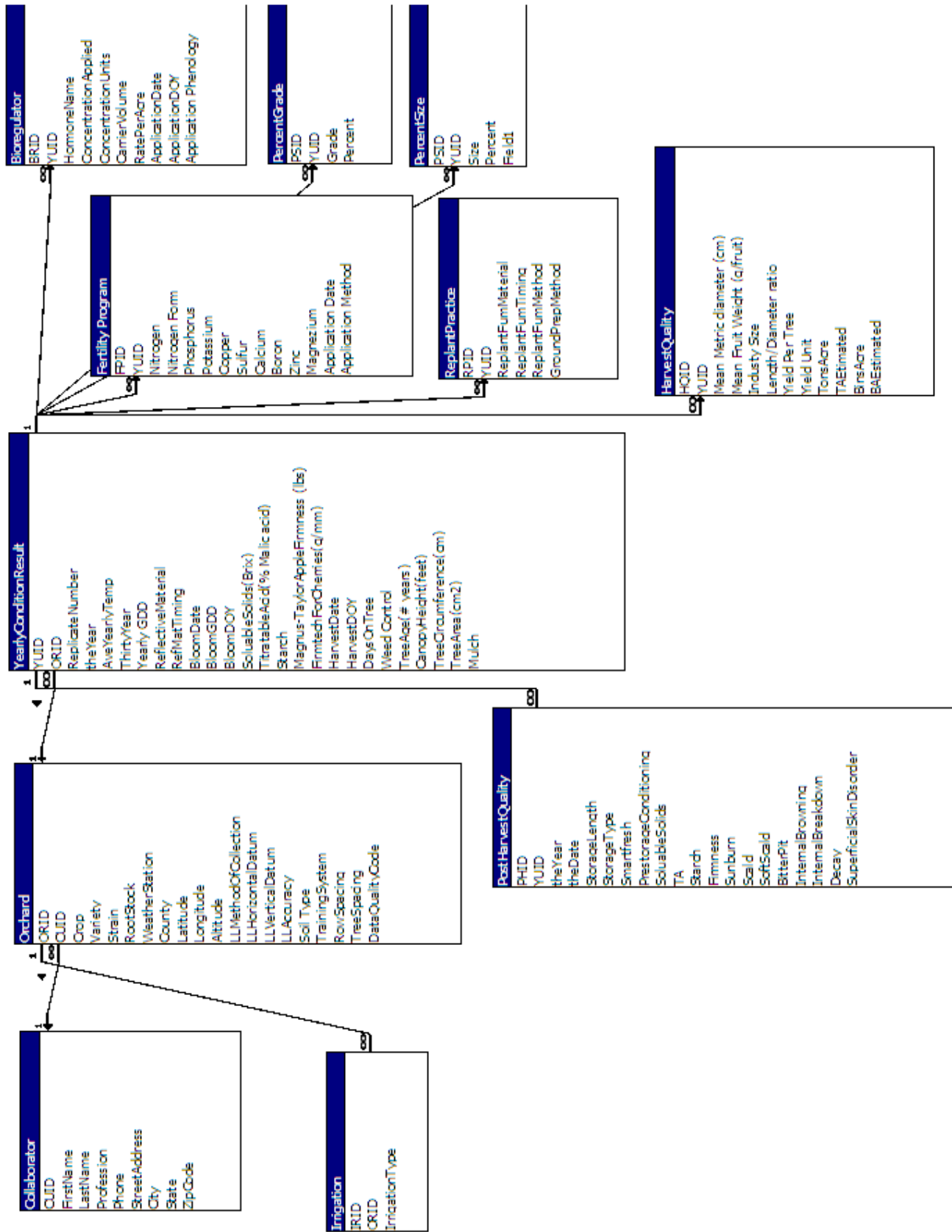
Figure 1: Architecture of the Orchard Conditions Database.

The basic search option has four criteria to select from—crop, rootstock and/or variety, county, size and/or yield. A limited amount of data is displayed (Fig. 3).

Variety	Rootstock	County	Strain	Year	Harvest Date	Soluable Solids	TA	Firmtech (g/mm)
Bing	Mazzard	Yakima		2006		11.00	0.35	
Sweetheart	Mazzard	Chelan		2006		12.50	0.67	
Sweetheart	Gisela 6	Chelan		2006				
Bing		Douglas		2006				
Skeena	Mazzard	Okanogan		2006				
Rainier	Mazzard	Douglas		2006				

Figure 3: Output of a "basic search"

The advanced search in OCD allows the user to select nearly any of the variables in the database (i.e. crop, rootstock/variety, location, yield and quality, management practices, temperature, and post harvest). The results of this search are exported directly to excel for easy sorting and comparison.

Variety information is adapted, with permission, from the extension publication Sweet Cherry Cultivars for the Fresh Market PNW 604 (Fig. 4). Apple variety information is adapted from various sources and covers basic information about bloom and maturity. The rootstock information is still being developed, but will be added shortly.

Figure 4: Example of a cherry variety page.

The administration page is password protected to track users. Here authorized users can enter data directly or upload excel spreadsheets. I will work annually with the breeding programs and WTFRC to incorporate their data and keep the system up to date. Theoretically, the upload of data should be quick, since the bulk of the information is already entered.

OCD has cherry data from the 1980's and almost half a dozen years of apple data from the breeding and WTFRC programs. Nonetheless, there are significant gaps in the data particularly in yield, fertility and plant growth hormone applications. Most of the researchers did not keep this information unless it was relevant to the project.

I will continue to maintain, improve and annually enter data into the OCD. In addition, I am collaborating with Dorrie Main and team members of the successful SCRI grant on "Tree Fruit GDR: Translating Genomics into Advances in Horticulture" to incorporate this database into their efforts so that genotypic and phenotypic characteristics are housed in one site.

Executive Summary:

The Orchard Conditions Database (OCD) is designed to systematically aggregate data collected from previous and ongoing research trials in cherries and apples. The OCD captures location, management, and fruit performance variables to serve as a tool for orchard establishment and horticultural research. Aggregated information includes rootstock, variety, fruit characteristics, management practices, yield, soil type, weather, and year.

Through this project we have developed an architecture and online searchable database that can be easily transferred and expanded to other systems and/or commodities. OCD is linked with AgWeatherNet and aggregates relevant data from WTFRC trials, WSU cherry and apple breeding programs, OSU Cherry research and most of WSU Apple Breeding Program.

The online database has 6 main links—home, basic search, advanced search, variety information, rootstock information, and administration page. The basic search allows the users to select from four criteria—crop, rootstock and/or variety, county, size and/or yield—with a limited amount of data output. The advanced search allows the user to select nearly any of the variables in the database (i.e. crop, rootstock/variety, location, yield and quality, management practices, temperature, and post harvest). The results are exported directly to excel for easy sorting and comparison. The variety and rootstock information is adapted from various information and resources to provide a basic description of information. Lastly the administration page is used to directly enter or upload data from excel.

OCD has cherry data from the 1980's and almost half a dozen years of apple data from the breeding and WTFRC programs. Nonetheless, there are significant gaps in the data particularly in yield, fertility and plant growth hormone applications. Most of the researchers did not keep this information unless it was relevant to the project. It is our hope that with a centralized repository, the data will be collected for specific areas and treatments in future research.

I will continue to maintain, improve and annually enter data from WTFRC and the breeding programs. In addition, I am collaborating with Dorrie Main and team members of the successful SCRI grant on "Tree Fruit GDR: Translating Genomics into Advances in Horticulture" to incorporate this database into their efforts so that genotypic and phenotypic characteristics are housed in one site.