

Recovering Value from Organic Waste Materials... Winecycling

by

Eric Leber

AprèsVin Enterprises, Inc.

FruitSmart, Inc.

Prosser, Washington



...more goodness from the grape



First, a brief historical
perspective...



Associated **AW** *Vintners*

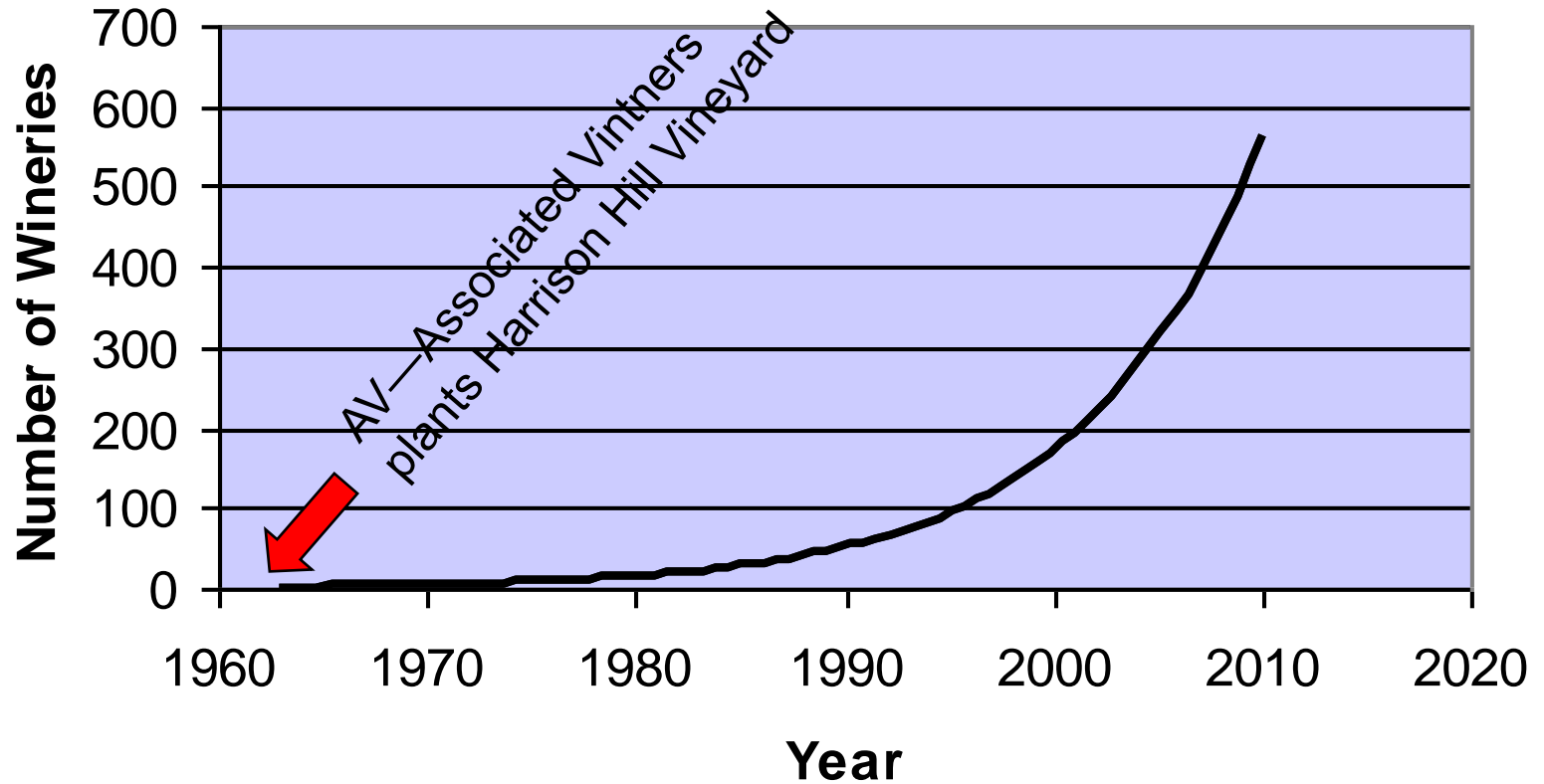
TED LEBER
Co Founder



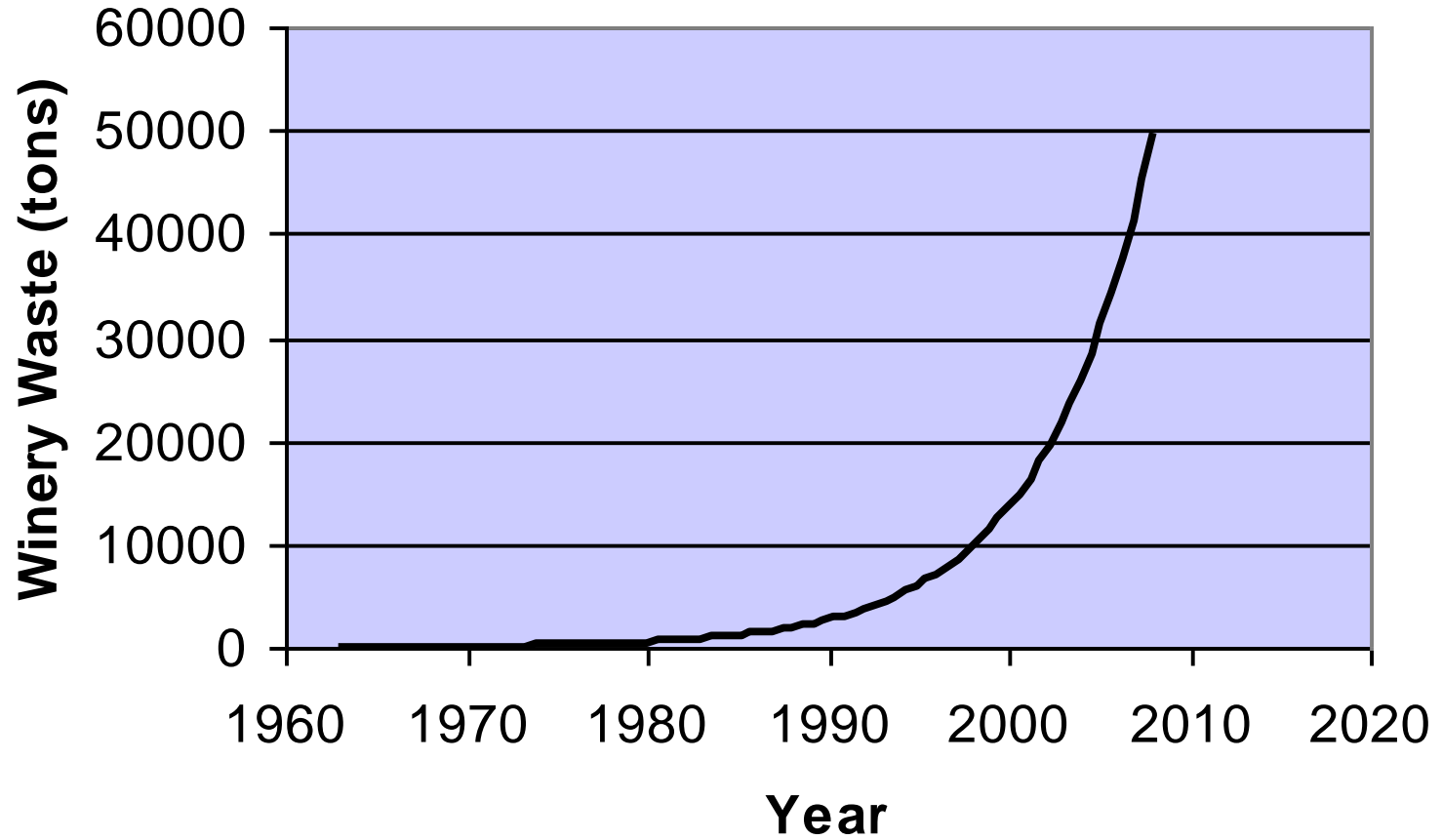
Associated Vintners shareholders planting their Harrison Hill vineyard.

—*Photo courtesy of Associated Vintners.*

Growth in Washington Wineries



Growth in Washington Winery Waste



Unlicensed Hunter Can Sue Seneca, Milne



TRI-CITYHERALD.COM

Sunday, March 30, 2003
Northwest @2

Lawsuit highlight

THE ASSOCIATED PRESS YAK

Almost seven years ago
into a deep pit of smold

Phillip Hickie, then a soy
would still lose both his

"The top of this pile, it v
Doug Merritt, recalling t
accident. "The top is kin
extremely hot."

Here in the Yakima Vall
are a \$40 million indust

Fruit juice companies Si
contracted with Whitney
left over from their loca

Top Mid-Columbia stories for

Prosser grapes, gripes grow on

By **MIKE LEE**
Herald staff writer

PROSSER - Sitting atop his grape harvester and Phil Whitney couldn't have been happier. The sn ago when the Prosser farmer started dumping he the vine rows.

Using old grapes to grow new ones is nothing ne middle of a movement to recycle biowaste in the dividends for business and the environment, said Richland.

But the practice is controversial, and the Benton regulate it closely.

Four years ago, Whitney was sued for negligent crime, but the practice came under fire again las after falling into a pit of recycled biowaste on or

"That's what alerted us to the problem," said Ric started working at that point to make sure this st

Decomposing organic material can ignite even t can be smelly, Dawson said.

AROUND THE Northwest

Lease Canceled Over Grape Waste Stink

RICHLAND — Grape waste is raising a stink in this Eastern Washington town, and the busi- ness blamed for the sour stench has lost its lease and been told to move, officials say.

Since March 15, the Benton Clean Air Authority has reported getting 30 to 40 complaints about the reeking heaps of grape waste on land owned by the Port of Benton.

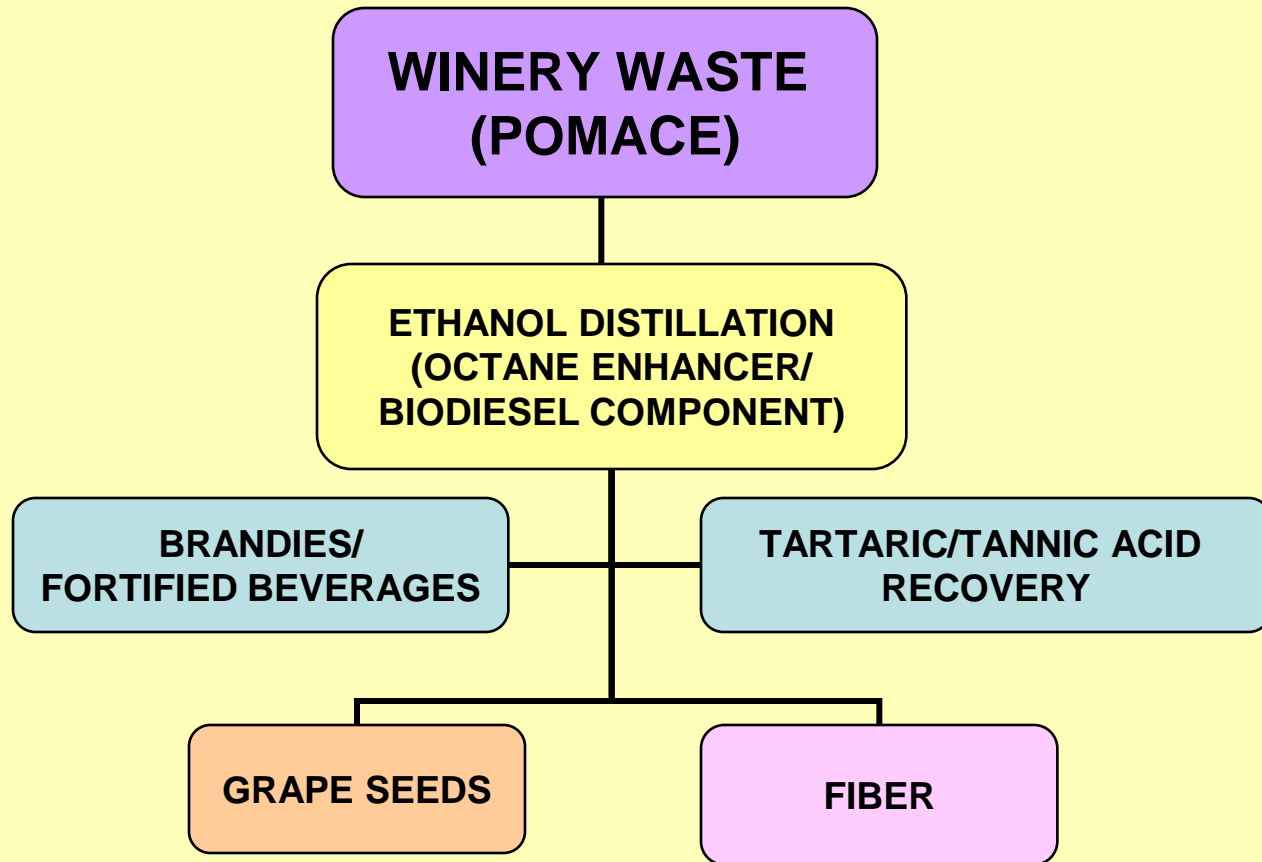
"It's a very bad, nauseating odor," said Monica Smith, executive vice president of Garlick Enterprises Inc., which owns a nearby business park.

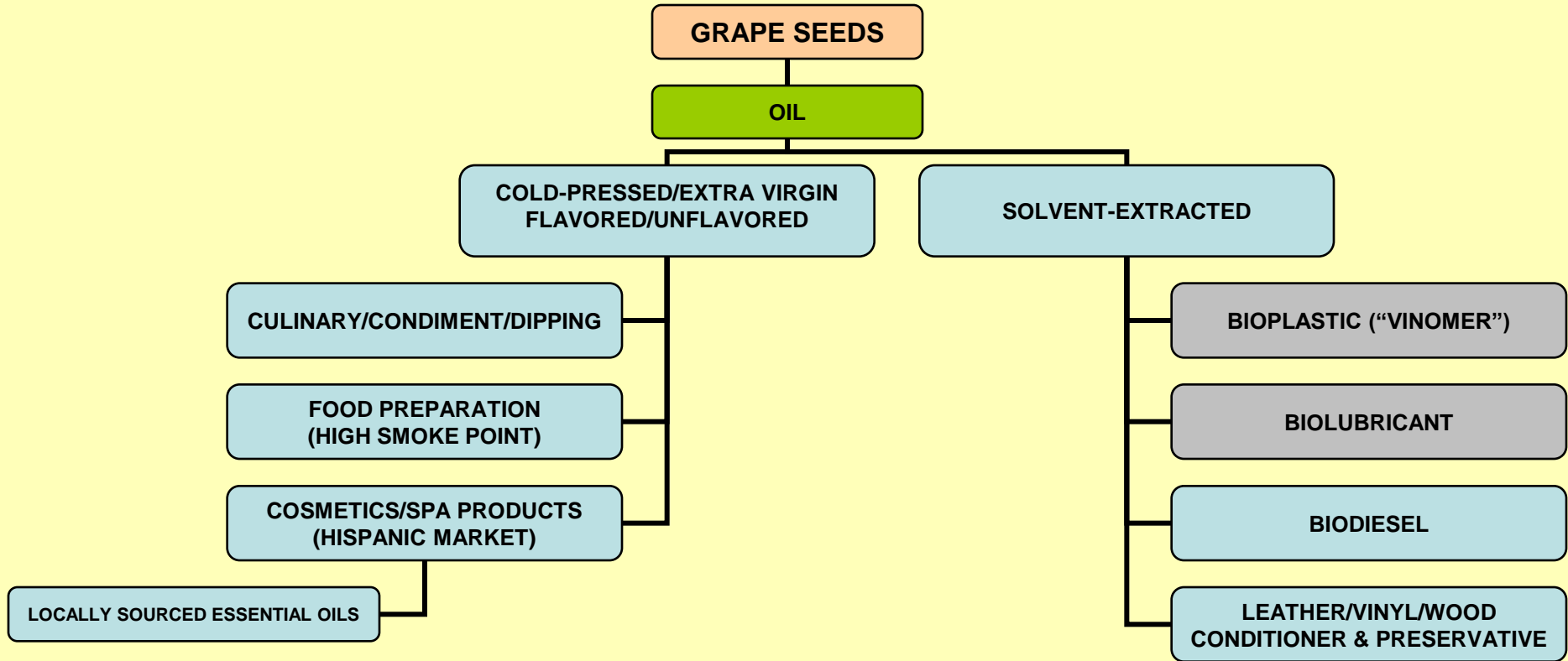
The Tri-City & Olympia Railroad, which leases the port land, has canceled a sublease for the grape waste business and asked that it be moved by the end of next month, air quality inspector Terry Flores said.

The agency may issue a notice of violation demanding faster action, and "I think we're going to try to get them to get that place cleaned up quicker than that," Flores said.

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VALUE CASCADE





GRAPE SEEDS (cont.)

PRESS CAKE

GRAPE-SEED EXTRACT

NUTRICEUTICALS
(ANTIOXIDANT/PHYTOCHEMICALS)

ANTIBACTERIALS/BIOCIDES
PESTICIDE/INSECTICIDE

PRESERVATIVE

UV ABSORBING SUNSCREEN

NUTRITIONAL FOOD ADDITIVE

BAKING INGREDIENT
(BREADS, PASTRIES, CRISPS, ETC.)

PASTAS/SAUCES

BEVERAGES
("BOOMER TEA")

ETHNIC FOODS
(MEXICAN CUISINE)

ANIMAL FEEDS
(HIGH-CLA/HIGH-PROTEIN)

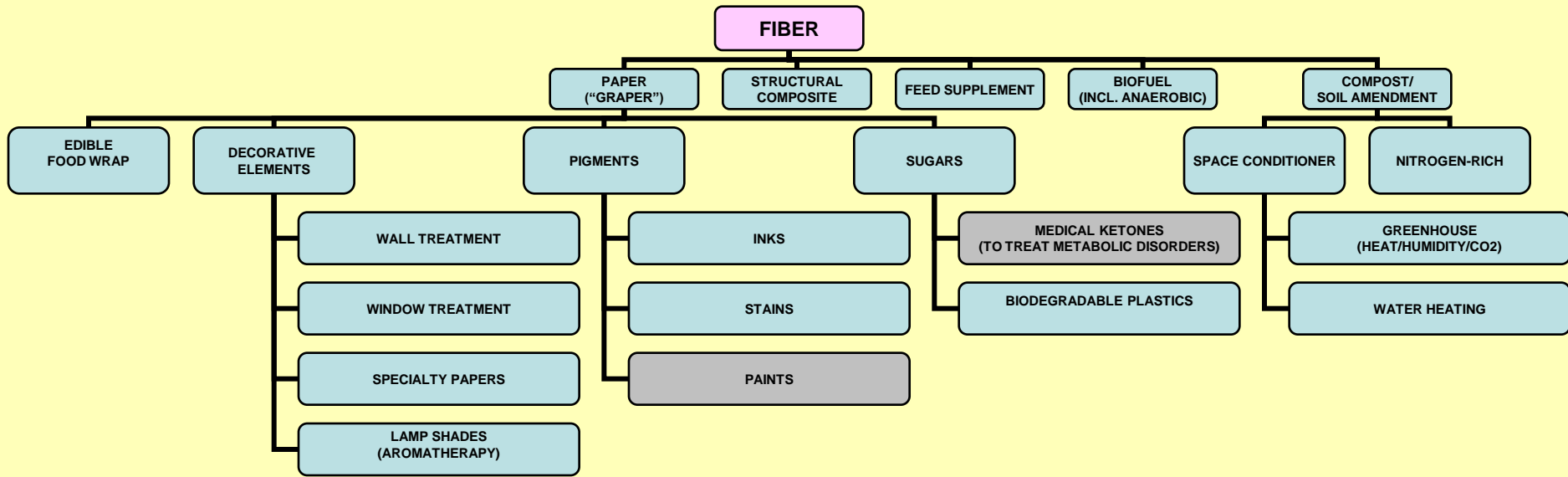
BIOENERGY

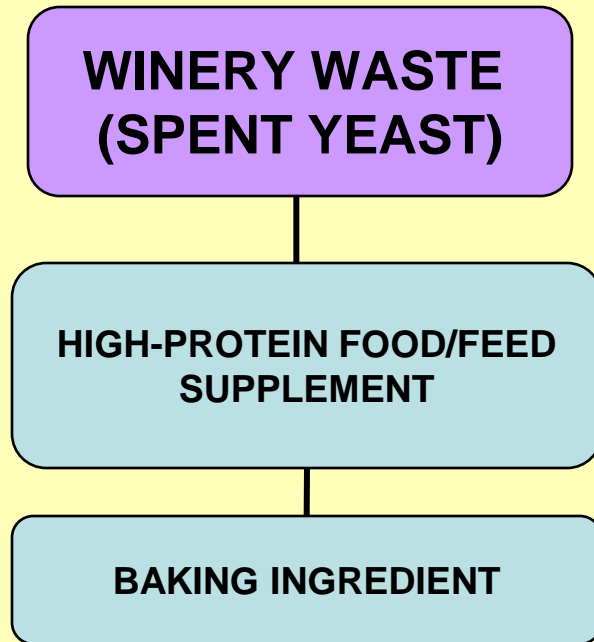
SOLID-FUEL
PELLETS/LOGS

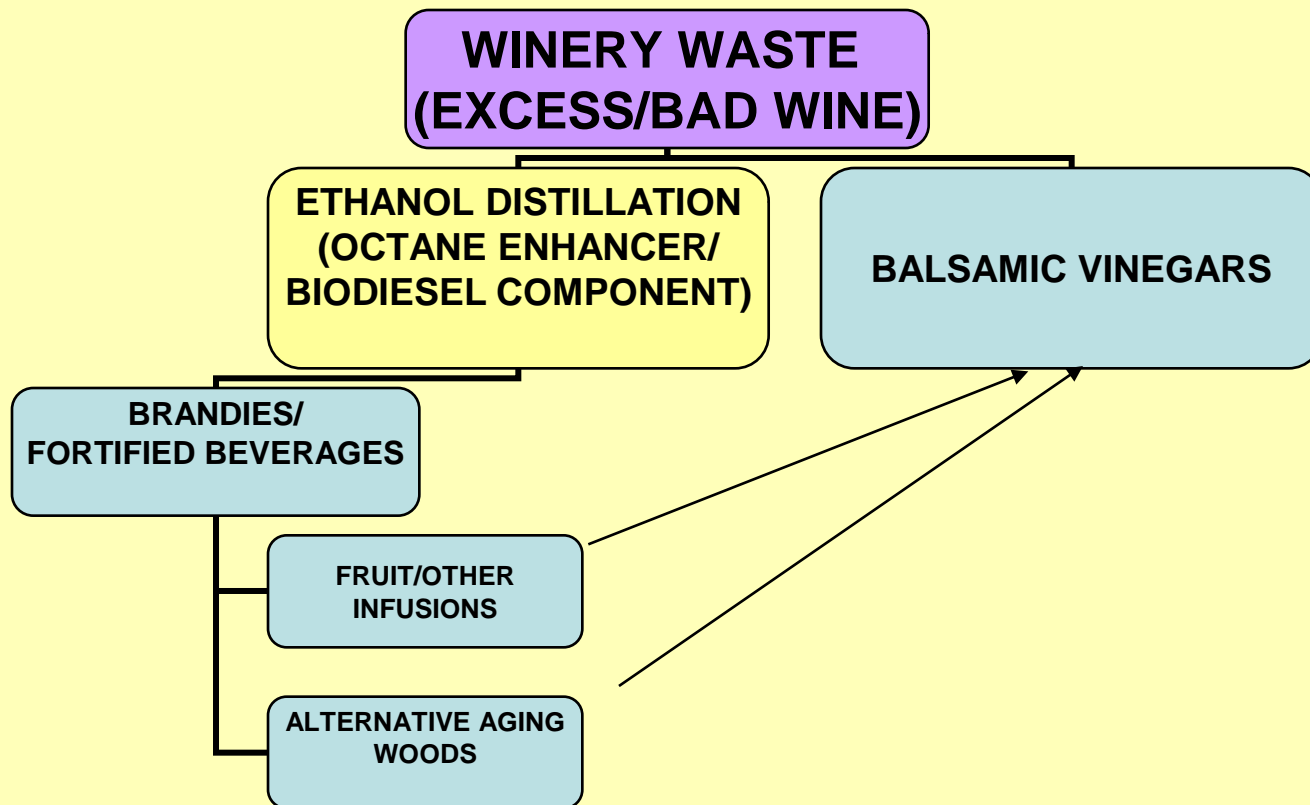
LOW-BTU PRODUCER GAS

kWh/Btu

CARBON PELLETS
(FILTRATION MEDIA)









In the shadow of Rattlesnake Mountain...

Winemaking begins with the grape harvest in the fall.



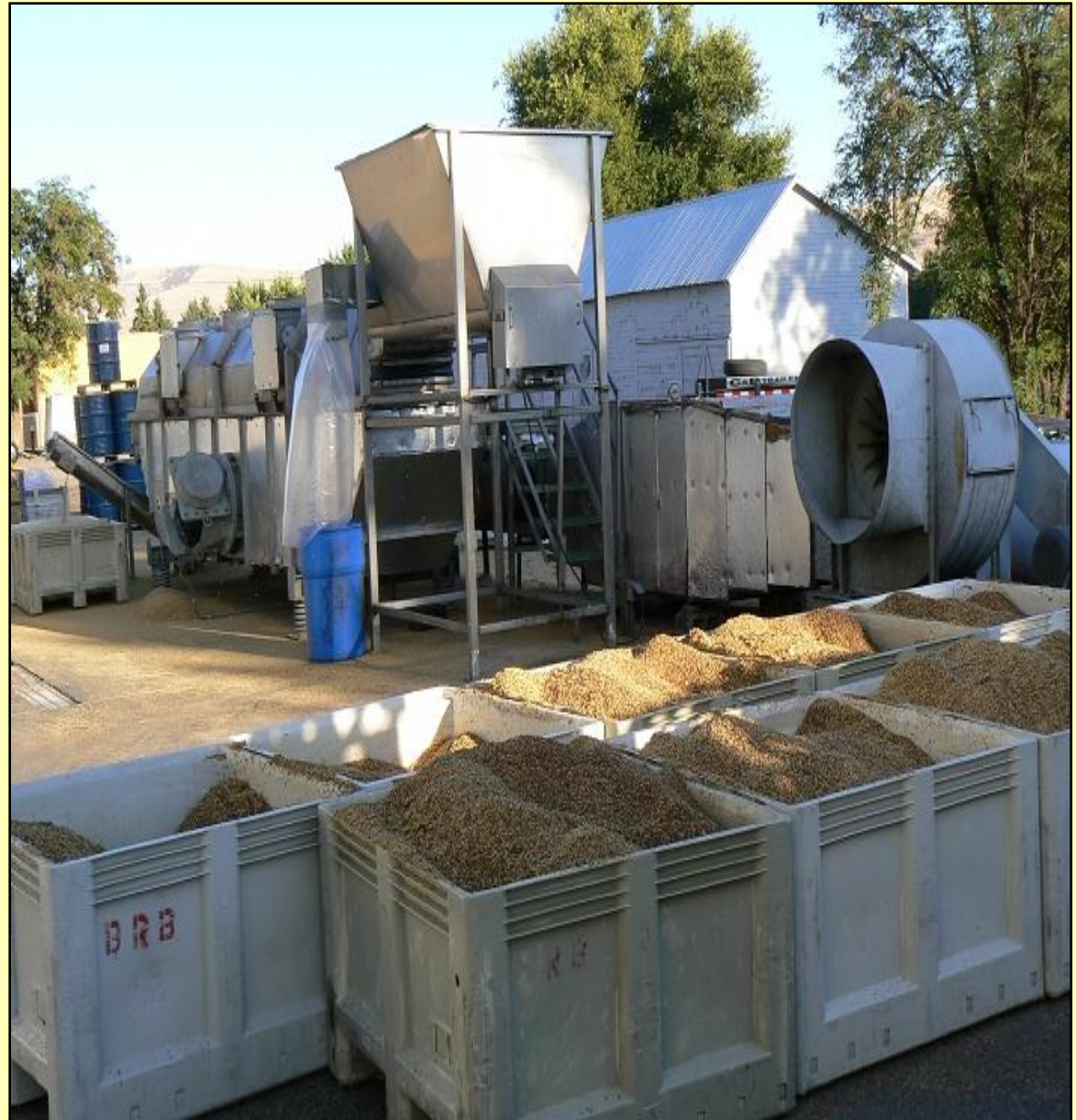
After the grapes are crushed and the wine is made, the grape residues (the “pomace”) are collected and then blended for uniformity.



A trommel screen provides an initial separation of the seeds from the larger grape residues.



Within a few hours after leaving the winery, the wine byproducts are ready for drying.



When most of the water is removed from the seeds, they can be more easily separated from any remaining grape skins.



A multi-step process results in a clean, dry product that is 99.9% pure seed.



Seeds flow from the hopper into the expeller press for cold-pressing. The varietal grape-seed oil drips from the barrel while the press cake is extruded from the nozzle.



Bottling the oil for market is a team effort.



A filler is used in bottling the grape-seed oils.



Adding corks, labels, and heat-shrink capsules is the finishing touch before the bottles are ready for market.



The solid part of the seeds, the “press cake”, is collected for subsequent milling.



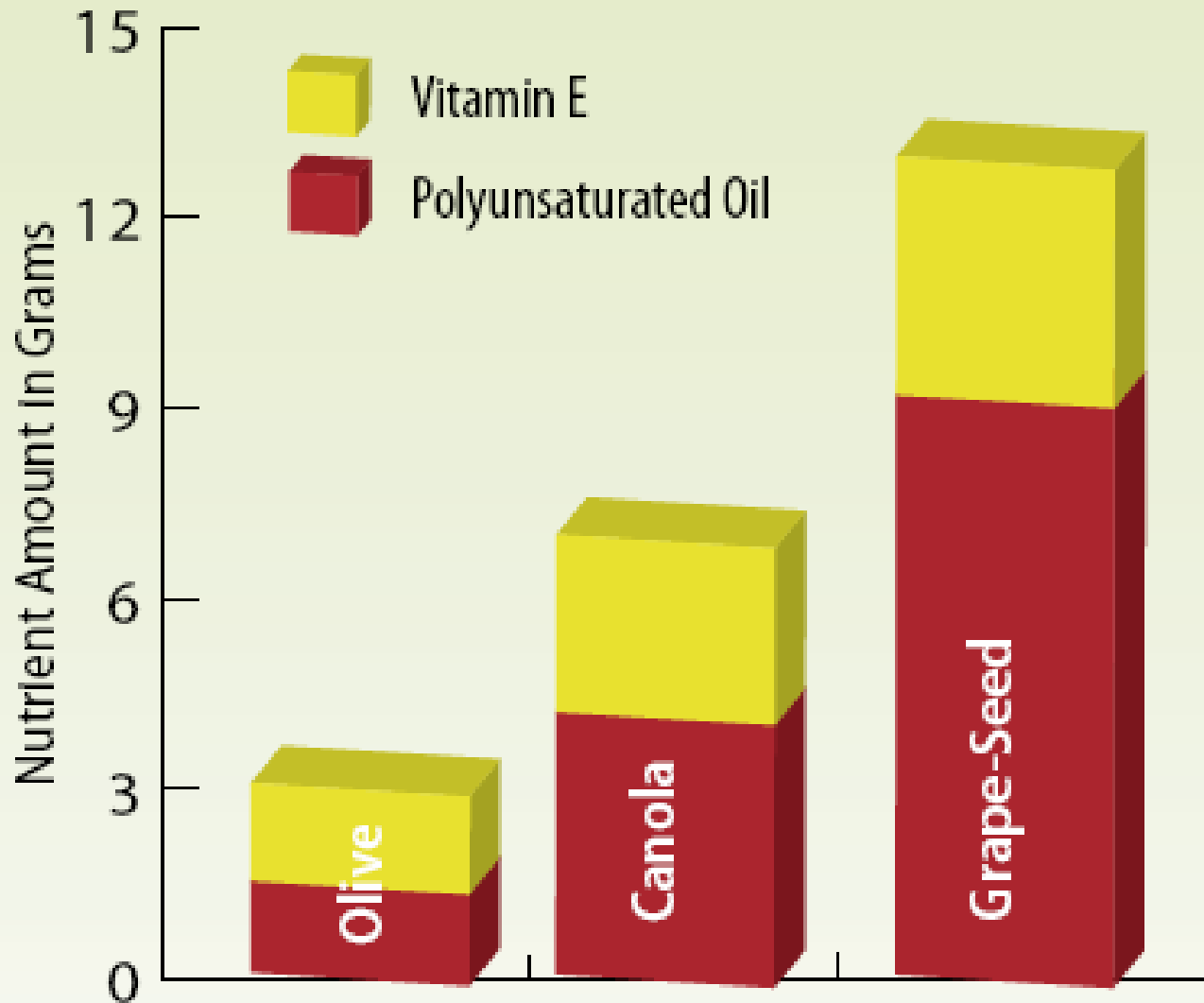
A flour mill is used to fine grind the press cake into a highly nutritious baking flour.



Oils...



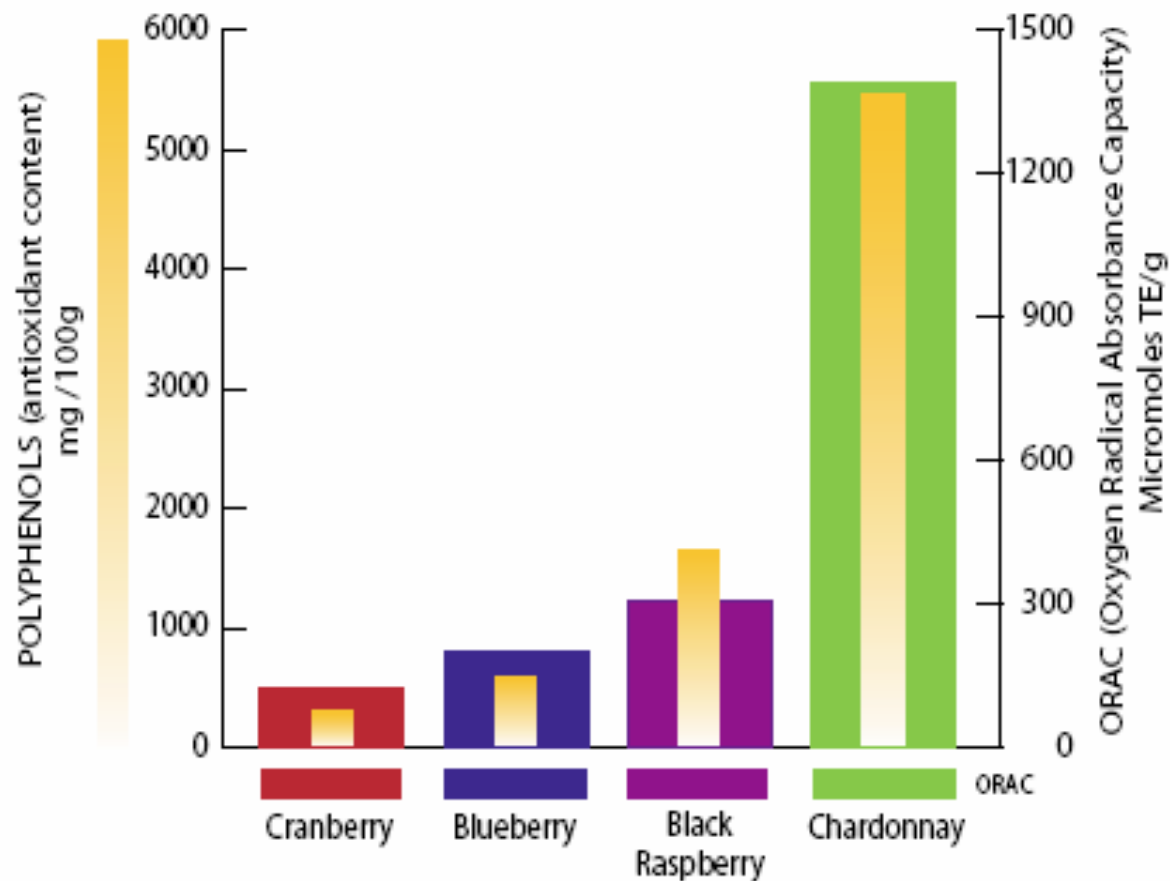
Nutritional Properties of Oils



Flours...



Antioxidant Content and Activity of Select Fruit-Seed Flours



Bioenergy...

solid fuels...

Clean Energy & Environment Project

A Feasibility Study and Demonstration Project
Evaluating Biomass as a Fuel for
Gasification to Produce Energy

Funding received from Washington State
Community Economic Revitalization Board

Primary Participants

- Port of Benton
- FruitSmart
- Center for Strategic Alliance
- Pacific NW National Laboratory
- REL Associates

Additional Participants

- Yakima Chief (pellet mill owners/operators)
- Mid-Valley Milling (pellet mill owners/operators)
- Seattle Biodiesel (crude glycerin supply)
- WSU Chemical Engineering

misc. byproducts for fuel blending



loading feedstock into blending tank



adding glycerin from Seattle Biodiesel



fruit, wood, and glycerin being blended



feeding blend into pellet mill



pellet mill at Yakima Chief



pellets ready for gasification

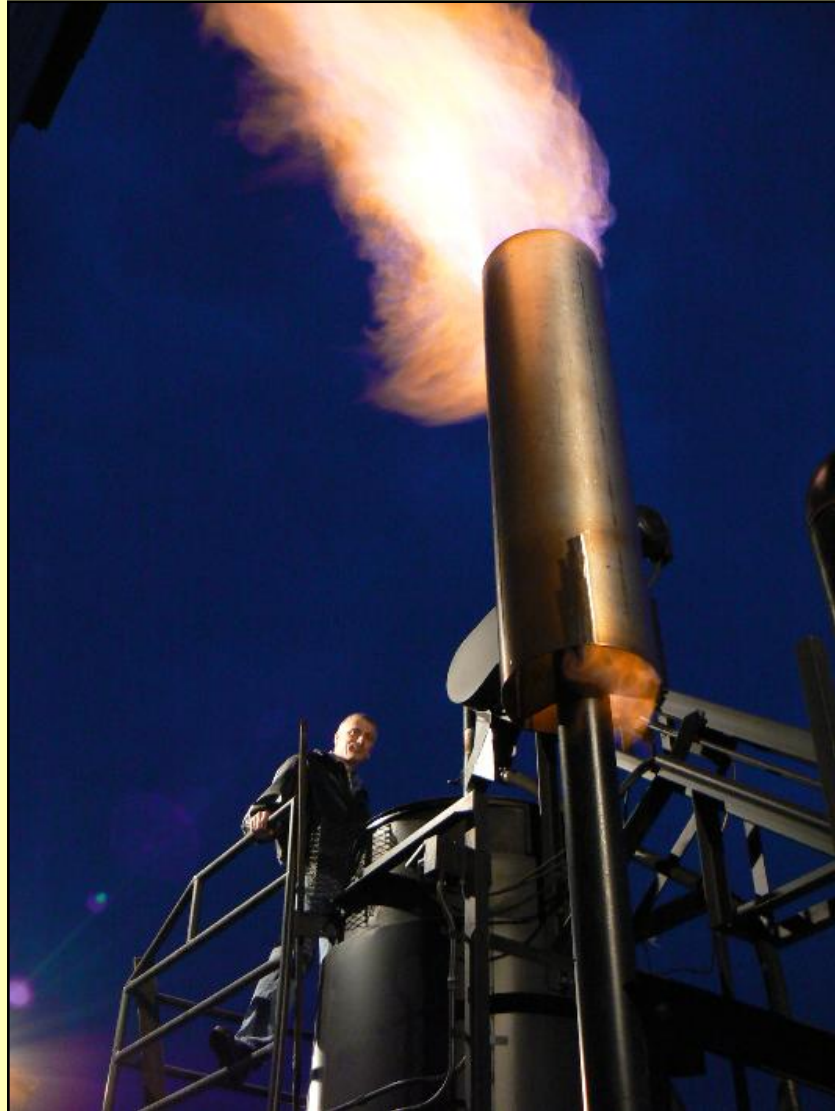


gaseous fuels...

gasifier as installed at FruitSmart



2 million Btu/hr of bioenergy



combustor at air-to-air heat exchanger



inside air-to-air
heat exchanger



dryer air inlet



...filtering contaminants out of water or air with the charcoal leftovers



liquid fuels...

synthesizing...



and testing biofuel blends



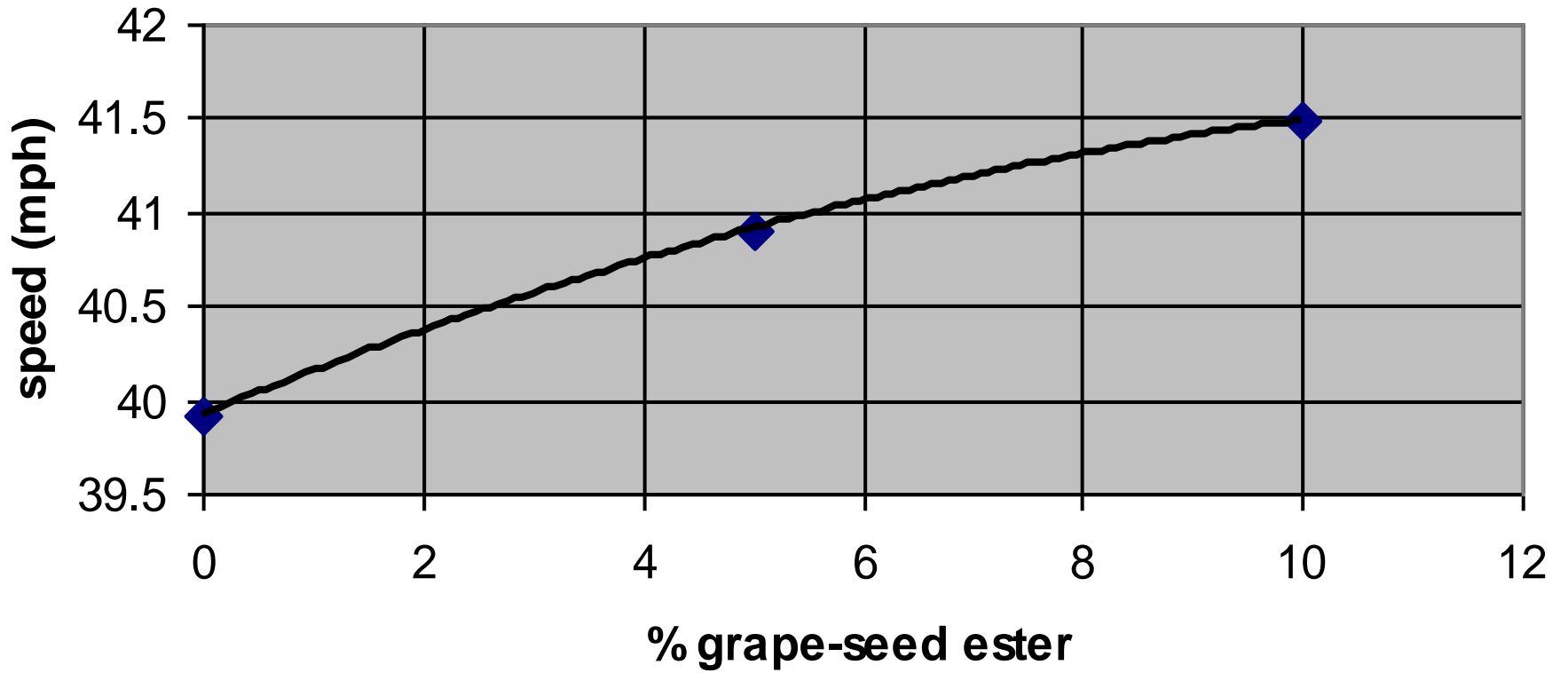
testing oil lubricities



testing performance-enhancing fuel additive
...eau de vitesse



Additive Performance



Other values...

“vinomers”



converting residual fibers to paper (“graper”)

...red



...or white

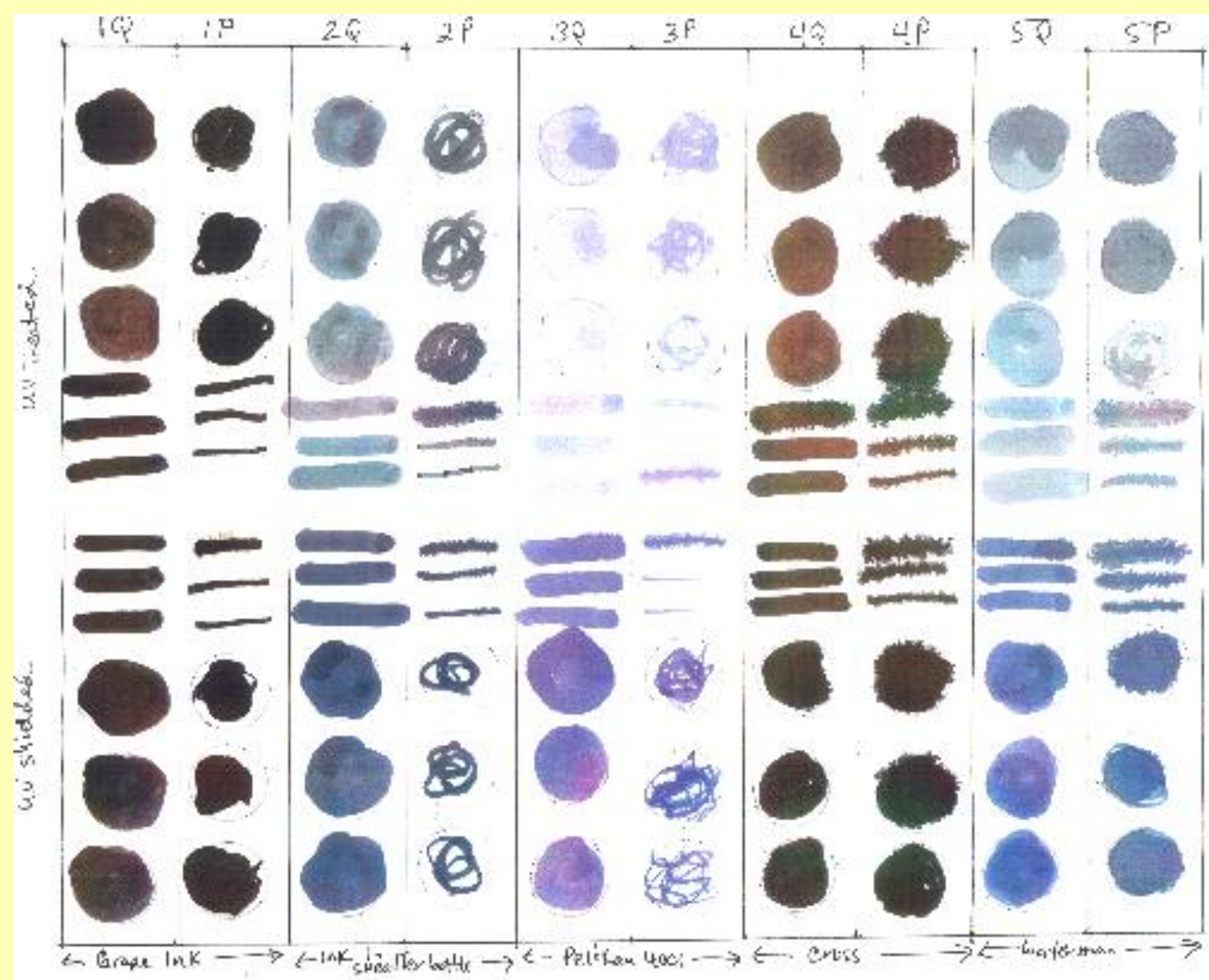


decorative “graper” (also edible food wrap)



pigments for ink and pens...





← Grape Ink → ← Ink Schlüsselkarte → ← Pelikan 4001 → ← Cross → ← Waterman →

and water-based stain...
cabernet franc pigment pellets



Pucker Power: Chardonnay “coffee” and “Boomer Tea”



residual alcohol as a
fuel additive (high octane)
or marc brandy
(aged with oak)



balsamic vinegars



searching for...



and finding

fragrances for
soaps & cosmetics



some serious sniffing!



direct from Hillbilly Stills (via eBay)...
an essential oil extraction system



essential oil garden



Essential Oils

EcoVino is a grant-project sponsored by the Economic Development Association (EDA) that allow students to develop soaps, oils, and papers out of discarded grape wastes.

Useful Grape Parts:

Pulp – can be used to manufacture paper.
Seeds - are grown and extracted to produce glycerol and oils, essential ingredients used to make cosmetics and bio-diesel oils.

Notes: My project is to grow and maintain healthy plants in the field. The lemon grass and french lavender are grown for use to extract oils. The extracted oils will be used as an ingredient in various cosmetic formulation, vinegar, and edible oil.

Lavender

Background: The name Lavender is derived from the Latin word *lavare* meaning, "to wash oneself." There are over 60 types of lavender plants. Lavender is a shrubby plant indigenous to the mountainous regions of the countries bordering the western half of the Mediterranean, and cultivated extensively for its aromatic flowers. Over a thousand years ago, the monks brought the lavenders to the Northern parts of Europe and began propagating it for its many beneficial uses, particularly as medicinal herb. The lavender is closely related to the rosemary, sage, thyme, and basil.

Cultivation: Xerophytic—The plant flourishes best on warm, well-drained loam; a fairly easy culture in almost any friable, garden soil. It requires little maintenance.

Practical Uses: Lavender was used in earlier days as a condiment and for flavoring dishes. It has aromatic and healing properties. This herb has uses in culinary, cosmetics, medicine, and landscaping. Interest in this plant continues to grow from large-scale operations to small home gardeners.

Alternative Fertilizer

Another part of my research involves a study container to determine the most efficient way to grow lemon grass. In all, I have 28 lemon grasses that have been re-potted in either all miracle grow, grape compost, or a mixture of miracle grow and grape compost.

This study should allow us to estimate the fertilizer need of an essence producing plant. Likewise, this will help growers determine if grape wastes is an effective alternative fertilizer. If so, this will mitigate grape cost to producers.



Frank Chandler developing bioassays for UV protection and anti-bacterial action



antibacterial
component



Commercialization Challenges:

- Consumer awareness and understanding
- Market assessment
- Intellectual property management
- Technical questions
- Export market
- Production infrastructure
- Sourcing...extent of participation by wine industry

- Several hundred new, year-round, living-wage jobs;
- Healthier rural economies;
- Improved environmental quality;
- Sustainable supply of feedstocks for conversion processes;
- More diverse energy-resource options;
- Better regional and national security;
- Near zero net greenhouse gas emissions; and
- Technology exports.



THANKS FOR YOUR INTEREST!