

# Growing Hops in Southern California – UCCE

Economics – Feasibility – Botany – Cultural Practices – Pest Control – **Harvest & Processing**



*June 21-22*



*Paul Vossen  
UC Cooperative Extension*

# Hops

## 1000 HOP PICKERS WANTED

245 ACRES OF HOPS

TO PICK IN  
THE YARDS OF

**WOHLER RANCH**

ON THE  
RUSSIAN RIVER

Butcher Shop, Grocery Store, Ice  
Cream Stand, Lunch Room at the Camp

FREE TENTS, WOOD AND WATER

**CHISHOLM FARMS CO.**

Phones: Santa Rosa 2F 15  
Windsor 6F 24

ROUTE 1, BOX 109  
Healdsburg, California

# Old Mechanical Harvesters



# Old Mechanical Harvesters



# Basic Mechanisms

*Remove cones & separate leaves*



# Basic Mechanisms

*Remove cones & separate leaves*



# Yakima Hop Harvest

- Most common: Haul bines to processor
- Carpenter Ranch: Haul hops and leaves to processor without bines and twine
- Remove cones by raking whole long bine
- Remove cones by chopping & raking
- Clean cones from leaves with fans and slanted conveyor belts

# Carpenter Harvest





# Carpenter Harvester



# Carpenter Harvester



# Carpenter Harvest – hops & leaves



# Carpenter Harvest Method



# VIDEO: Carpenter harvest



# Carpenter Harvest – vine and twine



# Harvest with the Vine



# Bottom Cutter – 1<sup>st</sup>





# Bottom Cutter – 1<sup>st</sup>



# Top Cutter – 2<sup>nd</sup>



# Top Cutter



# Vine Transport



# Hop yard after harvest





## **Hops are tricky to pick**

**Lupulin glands are fragile**  
**Vines and leaves are tough**  
**Harvest window is tight**

# Harvesting Revolution

Reliable  
mechanization of the  
hop harvest allowed  
for economies of  
scale, profitable  
farms and resulted in  
industry  
consolidation

May 2, 1967

P. F. DAUENHAUER ET AL.  
HOP HARVESTING MACHINE

3,316,916

Filed May 22, 1964

2 Sheets-Sheet 1

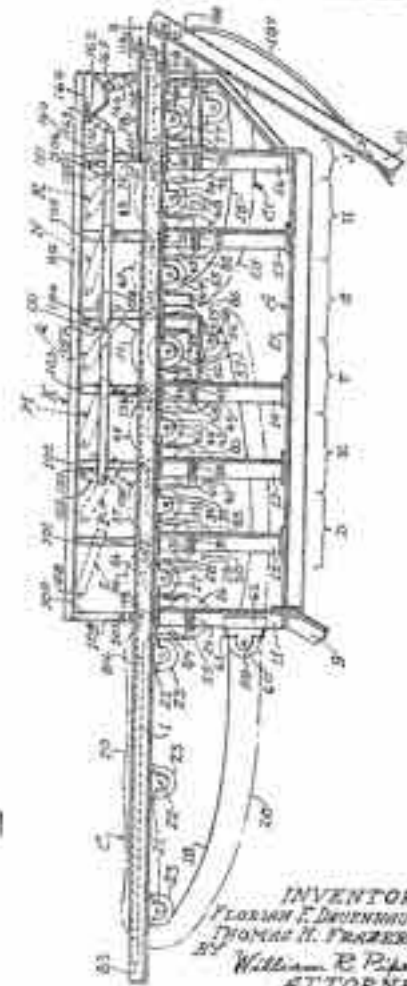


FIG. 2

INVENTORS  
FLORENZ E. DAUENHAUER  
THOMAS H. FRAZER  
BY  
William R. Pizer  
ATTORNEY

Tom Frazer  
Dauenhauer Mfg., Inc.

# Hanging vines – cones scraped off





# Processing Video – hanging vines



# Cutting up bines



# Rotating wire “rakes” knock off cones



# This is the Answer

Meet the Dauenhauer  
Picking Finger



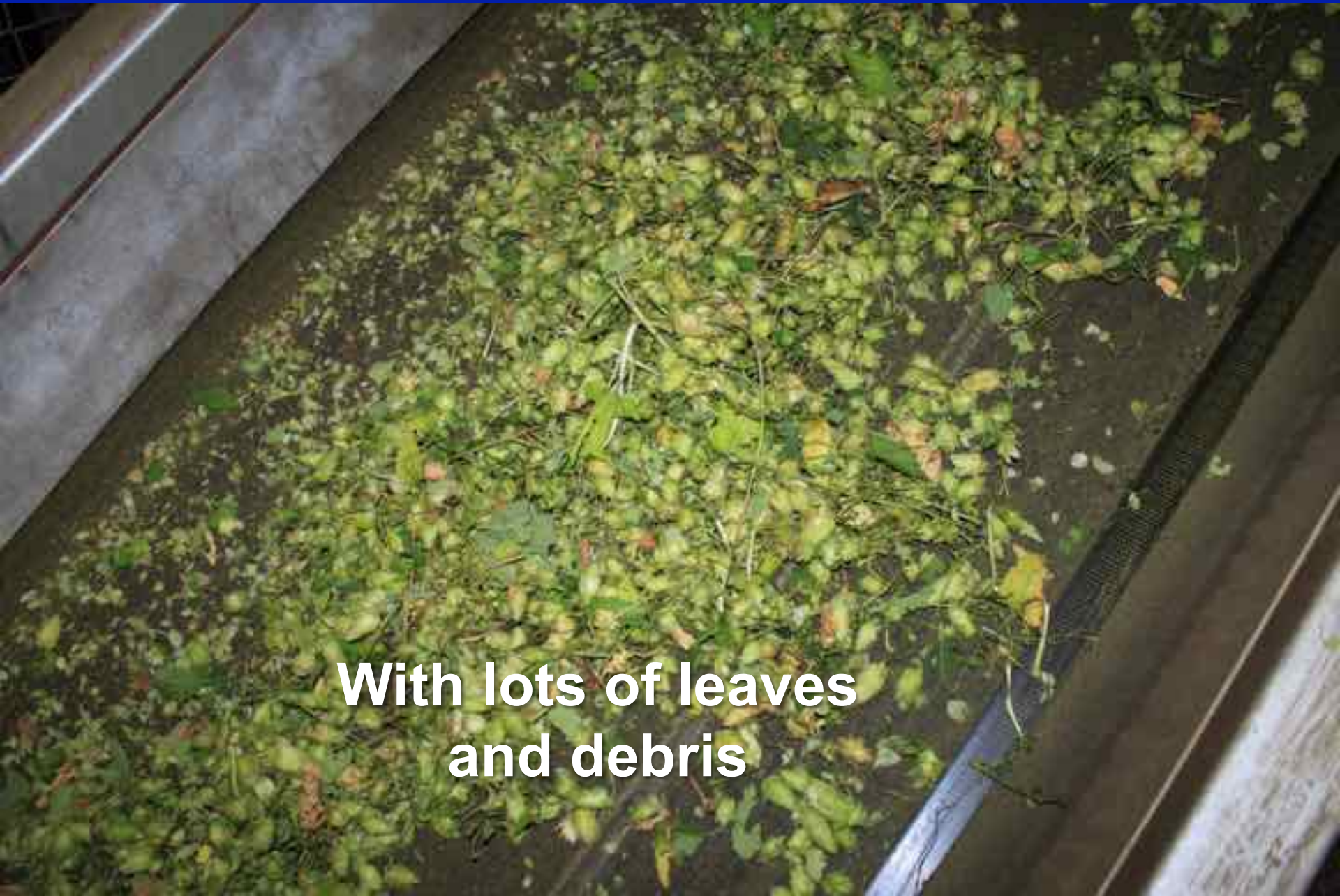
*Tom Frazer  
Dauenhauer Mfg., Inc.*

# Video: Raking cones off vines



# Chopped up – raked vines

With lots of leaves  
and debris



# Video: belts separating cones





**Cones  
separated on  
multiple  
slanted  
conveyor  
belts**



# Slanted conveyor belts



# Fans blow out leaves



# Video: cleaning cones



# Clean cones bound for dryer



# Yakima Hop Processing

- Drying: 128-160°F for 6-8 hours < 10% H<sub>2</sub>O
- Cooling: ~ 12-24 hours conditioning
- Bale dried hops: 200 lb. bales
- Storage: bales kept at 28°F
- Pelletize: crushed and pressed
- Extract: CO<sub>2</sub> Extraction Process
- Fresh hops: Transport: fresh hops in 1/2 size field bins in refrigerated trucks

# Video: Drying hops



# Dryer beds – 3 ft. deep



**Vented Floor  
Warm Air  
Underneath  
Propane burners  
and fans**





# Hops dried to 8% moisture



# Dry hops cooled and bailed



# Bailing



# Bales stored (28°F)



Random samples  
taken from bales

# Pellets and Extract



# How about picking by Hand?



**I have lots of Friends**

*Tom Frazer  
Dauenhauer Mfg., Inc.*



You will lose all your  
friends

It's a really tough job

Tom Frazer  
Dauenhauer Mfg., Inc.

# Used Wolf Harvester \$25,000





# Used Wolf Harvesters 2015

140/170 7 drum upgrade	\$25,500.00
220	\$40,000.00
280	\$45,000.00
400	\$125,000.00
Pellet mill w vac bagger	\$85,000.00
Drying floor w heater	\$7,500.00
Baler	\$6,500.00

Glen Fuller

Rising Sun Farms

North American Hop Equipment LLC

16540 Grange Road

Paonia Co 81428

970-209-8684

organichops@rof.net

<http://www.coloradoorganichops.com/>

<http://www.wolfharvester.com/>

Wolf Hop Harvesters and other Hop Farming Equipment

Home

Offer

Hop Pickers Export

Wolf Hop Harvesters

Hop drying floors

Carp cleaners and carp cutters

Other equipment



# Small Harvester Alternatives

Many solutions  
available  
Some better  
than others



# HopsHarvester™ Equipment

- ***Simple***

**PTO-Powered by small Tractor**

**No electricity needed**

- ***Safe***

**Meets OSHA regulations**

- ***Efficient***

**Up to 100x faster than picking by hand**

**Maintains quality of crop**

- ***Reliable***

**Built to be stored outdoors**



**Common off-the-shelf replacement parts**

- ***Economical***

**Pays for itself within 3-yrs for a typical 5-acre farm**

**Harvest an Acre a Day**



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# Hopster™ Models - HopsHarvester™



**Hopster5P – PTO-powered  
\$25,000 USD**



**Hopster5G – Self-powered (gasoline)  
\$30,000 USD**

# Proven Results with HopsHarvester™



Photo courtesy of Hopsteiner – S.S. Steiner, Inc.

## Hopster™ Harvester

Performance	120-180 bins/hr. 85-95% picking efficiency < 3% leaf/stem content
Specifications	6'W x 20'L x 8'4"H 3600 LBS Towable up to 25 mph
Requirements	Crew of 3 Tractor with 20 hp (540) PTO, and 1-set of remote hydraulics with 4 gpm flow
Background	Over 30 in-use throughout North America in 2015 100% on-time delivery Dedicated support



<https://youtu.be/DaVPrnyu9Zg>

# NorCal Hop Alliance Machine

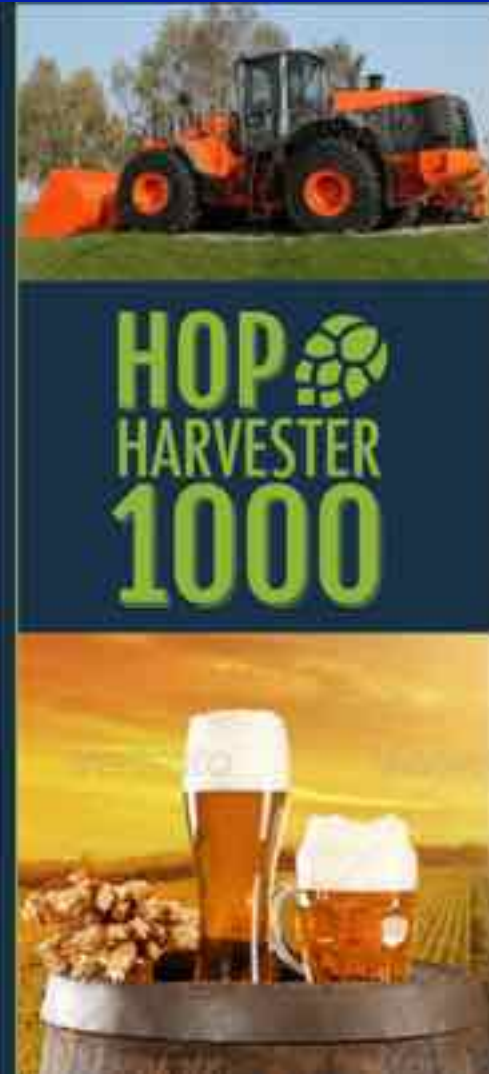


**\$14,000**



**STEENLAND**  
MANUFACTURING

PH: 607-326-7707 | cell: 607-434-8577  
94400 State Highway 30  
Rosbury, NY 12474  
steenlandmanufacturing.com



<https://youtu.be/zGfgElwUL3Q>

# Steenland HH-1000

## POWERED BY A 110 VOLT MOTOR.

This allows the HH1000 to operate on a regular outlet, as opposed to large pieces of equipment that requires a 220 volt outlet or higher. We believe that choosing electric over hydraulic, such as power off transmission pump (PTO), means that you do not need your tractor present when processing your hops.

## SMALL SCALE HARVESTING.

Designed for a farmer with 1-10 acres of hops.

## HORIZONTAL FEED SYSTEM.

No bine hooks, no need to pre-cut the bines.

## THE HH1000 IS APPROXIMATELY 9 FT LONG, 2.5 FT WIDE & 5 FT TALL

Making it the smallest machine on the market and allowing for easy storage when you have finished your processing.

## INNOVATIVE SEPARATING SYSTEM

The HH1000 separates the hops from the bines and leaves through a gravity system of belts.

## MORE PRODUCT, LESS HANDLING

The HH1000 can process 2 bines per minute and by one operator.

## EASILY PORTABLE

The HH1000 is designed to be portable if need be, allowing you to put the machine on the back of a pickup or trailer for easy transport. The processing for your hops can be done in the field or at a building of your choice.

## SAFER, MORE EFFICIENT STRIPPING PROCESS.

The stripping process on the HH1000 is done by rubber fingers system as opposed to the steel stripping bars. The rubber fingers account for less damage to the crop allowing room for more profit compared to the steel stripping bar and potentially less possible injury to the operator.



# Steenland HH-1000





# Steenland HH-1000

