Major topics to be discussed:

- Parts of spray system
- Nozzle types and uses
- Boom sprayers and proper adjustments
- Non-spray herbicide application equipment
1. Tank

   a) Corrosion-resistant, easy to fill and clean, shaped for mounting and agitation (openings for hydraulic or mechanical agitation)

   b) Capacity markings on side

   c) Sealing lid

   d) Drain at the bottom for through cleaning

   e) Types: Fiberglas (durable, can crack, some solvent problems), stainless steel (expensive, heavy, high use rate), galvanized (corrosion and rust flakes), aluminum tanks (good for most products, check labels for Al corrosion warnings) and polyethylene (suited to many types, proper mounting to avoid cracks)

   f) Strainer in the tank lid.
Multi-purpose farm sprayer
Boom spray for large fields
Spot spray for smaller areas
Turf sprayer

Macadamia nut sprayer
Cone shaped tank allows for complete volume use
Useful on hilly sites like orchards
2. Agitation devices

a) to maintain a proper mix in the spray tank

b) types: mechanical (paddles in tank) and hydraulic agitation (pipe or jet agitators)

(1) With hydraulic agitation fluid circulated by the pump.
Pumps used for hydraulic spraying

1. Pumps – (see HYPRO Sprayer Pump Handbook)

   a) Roller pumps (rolling vanes, flexible impellers, and sliding vanes) vanes come in a variety of coatings for various uses.

   (1) Sensitive to sharp object, coarse abrasives such as sand and barrel scale, use strainers to keep these out

   ![Diagram of a pump with rolling vanes.](image)

   FIG. 1. A pump with rolling vanes.

   $200-$900
Pumps used for hydraulic spraying

1. Pumps – (see HYPRO Sprayer Pump Handbook)
   
b) Centrifugal pumps, handles WP and abrasives well, rapid performance drop off above 30-40 PSI, no pressure relief valve necessary, may require a speed-up pulley from tractor PTO to get proper RPM.

$400 - $700
Pumps used for hydraulic spraying

1. Pumps – (see HYPRO Sprayer Pump Handbook)

   d) Diaphragm pump, positive displacement, similar to piston with regards to performance, different pump working mechanisms, available with corrosion protection coatings.

$1000 - $1500

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1. Pumps – (see HYPRO Sprayer Pump Handbook)

   c) Piston pump, positive displacement pump (output is proportional to speed and independent of pressure, high-pressure constant output) can deliver very high pressure for cleaning operations. Requires a surge tank to avoid spray pulsing, also damper in pressure gauge (glycerin-filled)

Piston pump
$400 - $600
1. Regulating devices

a) Pressure relief valves are used to return flow to the tank when spray boom is turned off. Without a pressure relief valve, pump can be damaged and hoses ruptured.

b) Pressure gauges mounted between boom control valve and nozzle tips. Keep as close to outlets as possible to monitor changes in spray pressure. Will increase if nozzles clog and decrease if leaks develop.

c) Unloader valve, similar to pressure relief except that when boom is shut off, flow from the outlet is directed to the pump inlet to reduce pump working pressure., used with positive displacement pumps running above 200 psi.
Diagram of a typical spray system

- Spray Tank
- Jet Agitator
- Suction Line
- Suction Strainer (50 mesh or coarser)
- By-Pass Line
- Agitator Line
- Pressure Regulator
- Pressure Gauge
- Shut-Off Valve
- In-Line Strainer (50 mesh or coarser)
- Boom
- Fan Spray Pattern
- Even Spray Pattern
Spray tips for broadcast applications with a boom

Tapered edge pattern
Uniform spray pattern at proper boom height
All tapered edged broadcast tips from TeeJet

- Turbo, tapered edge wide angles = low booms
- XR-extended range, used with flow controllers for changing PSI
- AI-air induction, large hollow droplets for drift control
- Drift guard, low pressure spraying w/large drops
- TwinJet, dual outlet tips for post spraying, best foliar coverage
- FloodJet, high gallonage, less clogging reduced drift
Twin jet for best foliage coverage
Even spray pattern for banding application

Spray pattern is the same
No tappered edges
Same tip features models as tappered edges
Even spray pattern for banding application
Even spray tip application
Full and hollow cone application-orchard spraying for insect control
Disc core tips for orchard air blast sprayers
Boomless tips-wide spray for trucks and train tracks
Also pasture sprays in very hilly areas booms not used

$W = \text{Maximum effective coverage with nozzle mounted at 36" height.}$
Non-spray herbicide application equipment

Wick application for topical herbicide applications
Between row wipers to prevent herbicide drift to sensitive vegetable seedlings
Broadcast herbicide wiper for non-selective kill. Used in noncrop settings where spraying is prohibited or winds are problematic.
Trailer mounted wiper for application to weeds higher than the lower growing crops.
Systemic herbicides applied to brush bristles and then rolled across area for no-drift weed control.
Duster & granular applicator
Air blast mechanism is isolated from material being applied.
A great tool but hard to find—purchased in Hilo at Coop.
End of slid show –
Let’s check out the equipment and view plots