ARCANUM VENTURES

MAIN MEAD BATCH
OPERATING PROCEDURE

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DIRECTIONS

ACTION items are in all capitals. This is direction to the operator (you) to perform a task.

DEFINITIONS

1. VERIFY: Verify something Is as the procedure expects. If it is not in the condition expected, locate assistance.

   e.g. VERIFY the PLC powers ON. If PLC does not power on, check the Estop button is pulled out by turning the key clockwise.

   It is expected when plugging something in that it will turn on. If, after completing the step it does not, this is a larger problem.

2 ENSURE: Look to see if something is as the procedure expects. If it is not in the condition expected, this phrase gives the operator (you) permission to change the status to what is expected.

   e.g. ENSURE *COMPRESSOR AIR RECEIVER OUTLET VALVE* is OPEN.

   It is expected that the valve may be in any position, but the step wants it open. IF you find it open, it is done. If you find it closed, you may open it.

OPERATING PROCEDURE

The following subsections contain instructions on how to conduct Main Mead Batch production. These procedural steps are preceded by a list of applicable Safety Considerations, Precautions and Limitations, and Pre-Start Checks that must be reviewed and completed before startup and operation. These instructions are to be used by an experienced Operator, who is knowledgeable of the machine and associated support systems.

Safety Considerations

1. Employees should always use the proper Personal Protection Equipment (PPE) for the task they are performing.

2. Personnel must observe standard safety precautions when working around or with hot water and chemicals.

Precautions and Limitations

The following Precautions and Limitations apply specifically to the operation of Secondary Mead and Cider Production Using Portable Heater. In addition to the items listed below, it is expected that the Operator exercise common sense, safety considerations, and industry acceptable techniques when operating plant equipment.

1. ENSURE the following systems are in service prior to producing a Mead batch:

- Electrical System
- Water System
- Hot Water System

Assumptions

1. The following assumptions apply:

- The honey has been heated to 80°C for 18-24 hours prior to start of this procedure

Pre-Start Checklist

The following provides instructions on how to set up to perform Secondary Mead and Cider Production Using Portable Heater:

Initials

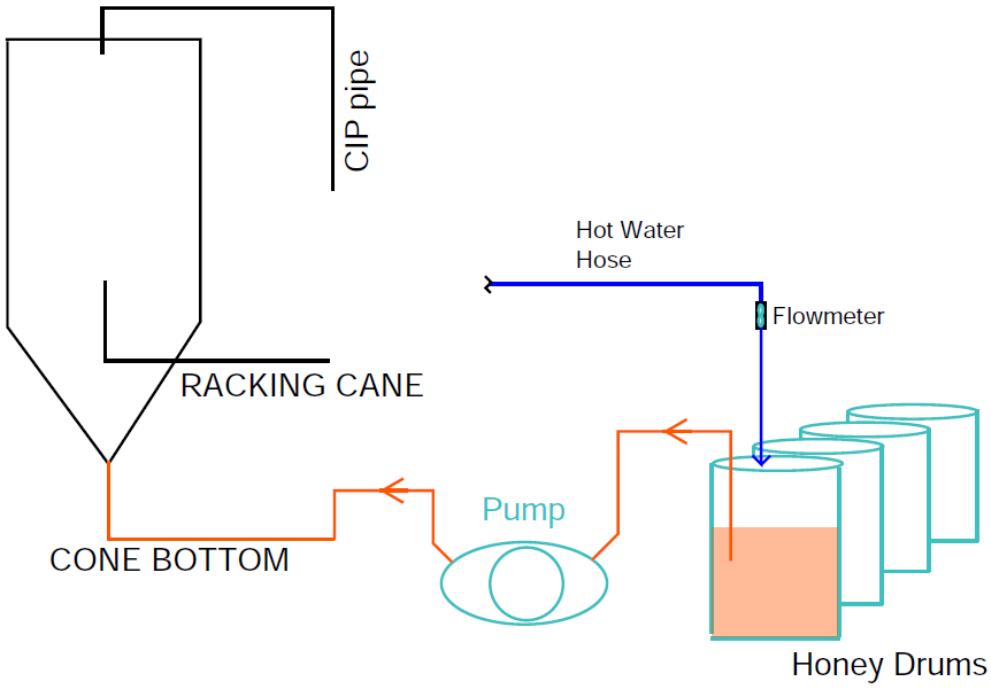
1. _____ REVIEW Ozone SDS, located in the SDS Binder, for protection requirements.

2. _____ OBTAIN the following:

- POSITIVE identification of the tank to be used for the batch
- Four (full batch) drums of heated honey
- Portable Ozonator
- Black Hot Water hose
- StarSan Spray Bottle
- Four long corrugated hoses
- Triclamp Flowmeter from the Measurement drawer in the large toolbox.
    - **a.** Set to 2 Batch
    - **b.** "LT" indicated in upper left
- 1 bag of Fermax for each drum of honey
- Batch Tracking Sheet
- 8 foot step ladder
- MEAD Main Batch Template Excel file.
- 5 Gallon Bucket of StarSan for Blowoff Tube

Main Mead Batch Production

Initials



Honey Pumping

1. _____ ENSURE the identified tank is ready to use by the status indication.

2. _____ CONNECT two of the long corrugated hoses to the pump.

3. _____ CONNECT one of the hoses' loose ends to the *CONE BOTTOM VALVE* on the tank to be used.

4. _____ SPRAY sanitize the outside of the loose end of the other hose, to a length longer than corresponding to a 55 gallon drum depth.

NOTE:	Honey pumps slower than water. Pumping out 4 drums will take approximately 1 hour.

5. _____ OPEN a drum of honey.

6. _____ SUBMERGE the sanitized hose end in the drum of honey.

NOTE:	ENSURE the hose is supported such that it will not pull itself out of the drum during use.

7. _____ OPEN the tank *CONE BOTTOM VALVE*.

8. _____ CLOSE the tank *CIP BALL VALVE*.

9. _____ START the pump and RUN it at 35-40 hz.

Main Mead Batch Production

Initials

10. _____ OBSERVE a drop in drum level as the honey is being pumped into the tank.

NOTE:	PAY ATTENTION to the flow arrow on the side of the Flowmeter. Install it in the proper orientation.

11. _____ WHILE the honey is being pumped into the tank, PERFORM the following:

a. _____ CONNECT the Flowmeter obtained previously to the end of the hot water hose.

b. _____ VERIFY Set to “2 Batch”

c. _____ VERIFY “LT” indicated in upper left

d. _____ RESET the totalizing counter by pressing and holding the DISPLAY button until the number on the display clears.

NOTE:	As the honey reaches the bottom of the tank, it needs dissolved to help the pump fully empty the drum.

12. _____ RINSE the drum sides and bottom as necessary to ensure all the honey is removed.

13. _____ WHEN the first honey drum is empty, THEN

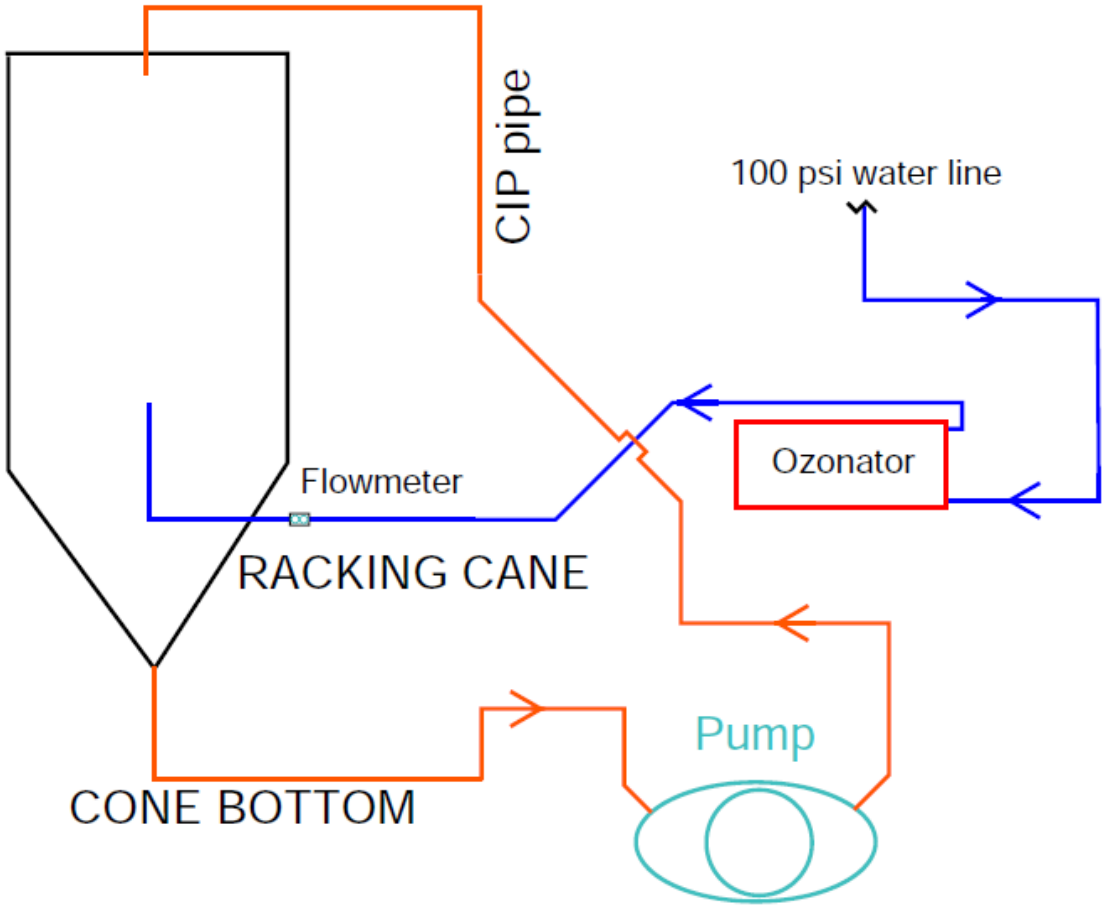
CONTINUE to the other drums.

14. _____ WHEN all four drums are emptied into the Fermenting Vessel, THEN

CONNECT the free end of the honey suction corrugated hose to the CIP pipe connection on the Fermenting Vessel.

Main Mead Batch Production

Initials



Ozonated Water Addition

15. _____ PUT empty drums outside Rollup door for rinsing and storage.

16. _____ As time allows, RINSE drums and lids, AND

STORE the drums behind the building in stacks and rings on the hooks.

NOTE 1:	PAY ATTENTION to the flow arrow on the side of the Flowmeter. Install it in the proper orientation.
NOTE 2:	**DO NOT** RESET THE FLOWMETER.

17. _____ DISCONNECT the Flowmeter from the hot water hose, AND

CONNECT it to the Racking Cane Triclamp.

Main Mead Batch Production

Initials

18. _____ CONNECT a long corrugated hose to the Flowmeter at the 100 PSI Water Line, located to the right of FV-2.

19. _____ CONNECT the other end of this hose to the INLET of the Ozonator.

20. _____ CONNECT a long corrugated hose to the OUTLET of the Ozonator.

21. _____ CONNECT the other end of this hose to the RACKING CANE port on the Fermenting Vessel.

22. _____ ENSURE the Racking Cane is pointing UP.

23. _____ OPEN the *RACKING CANE VALVE*.

24. _____ OPEN the *CIP BALL VALVE*.

25. _____ CHECK the following on the Ozonator:

a. _____ *GAS/WATER SELECTOR VALVE* is turned to WATER

b. _____ *OZONE/OXYGEN TOGGLE* is selected to OZONE

c. _____ *OPERATION TOGGLE* is selected to OFF

d. _____ *BARREL/ROOM GASSING* is selected to BARREL GASSING.

26. _____ OPEN the *100 PSI WATER LINE VALVE*, AND

VERIFY the Flowmeter is counting.

CAUTION

Any time the pump is stopped, ENSURE the Ozonator *OPERATION TOGGLE* is flipped to OFF, and is flipped back to WATER after the pump is restarted.

27. _____ ENGAGE the Ozonator by flipping the black *OPERATION TOGGLE* to WATER

28. _____ ENSURE the *CONE BOTTOM VALVE* is OPEN.

29. _____ CHANGE direction on the pump.

Main Mead Batch Production

Initials

30. _____ START the pump and RUN it at 30-45 hz.

31. _____ VERIFY the flow is from CONE BOTTOM to CIP BALL.

32. _____ MIX the honey and water in the Fermenting Vessel with the pump as the vessel fills with water.

NOTE:	It will take approximately 80-90 minutes to fill the tank with water.

33. _____ Every 15 minutes, REVERSE the pump to empty the CIP pipe back into the Cone Bottom Valve to allow the level reading to be accurate, THEN

RETURN the pump to the previous direction of mixing.

NOTE:	Prior to stopping the water flow, STOP the Ozonator. Restart the Ozonator AFTER reestablishing water flow.

34. _____ CONTINUE FILLING the Fermenting Vessel with **2700 Liters** of water as indicated on the Flowmeter, THEN

CLOSE the *100 PSI WATER LINE VALVE.*

35. _____ CIRCULATE the tank contents for 15 minutes, THEN

TAKE a gravity reading using a cylinder, and a hydrometer.

36. _____ IF the gravity reading is >1.102, THEN

ADD water in 50 Liter increments as necessary until Original Gravity (O.G.) is 1.100.

37. _____ IF the reading is close to 1.100 (1.096-1.101), THEN

CONTINUE circulating.

NOTE:	The Racking Cane Valve will need to be opened and closed as necessary during top off for gravity.
NOTE 2:	Stop and Restart the Ozonator as necessary.

38. _____ CLOSE the *RACKING CANE VALVE*.

Main Mead Batch Production

Initials

4”Access Port

NOTE:	It is not necessary to stop the pump prior to adding Fermax. You will not get wet and the powder can still be poured in.

39. _____ OPEN the 4” access port on top of the Fermenting Vessel.

NOTE:	Total 30bbl FV volume is 3520 Liters. A full 4 drum batch requires 4 lbs on the initial addition.

40. _____ ADD 1 bag of Fermax for each drum of honey used per Operating Procedure 15 *Batch Addition and Clarification*, AND

RECORD it on the Batch Tracking Sheet.

41. _____ CLOSE the 4” access port on top of the Fermenting Vessel.

Main Mead Batch Production

Initials

42. _____ CONTINUE Circulating for 15 minutes.

43. _____ TAKE a gravity reading using a cylinder, and a hydrometer, AND

RECORD it on the Batch Tracking Sheet.

44. _____ After 15 minutes, STOP the pump.

NOTE:	If already on the home screen, omit step a.

45. _____ At the Fermentation Control Panel, SET Fermenting Vessel temperature to 68°F as follows:

a. _____ From any tank screen, SELECT *HOME*.

b. _____ SELECT *MEAD TANKS SYSTEM OVERVIEW.*

c. _____ SELECT *SETUP* for the Fermentation Vessel (FMT1-4) that you just put the batch in.

d. _____ CLICK on the *STAGE 1 TEMP SETPOINT* number box.

e. _____ On the subsequent screen, enter the desired temperature, then select *RETURN* (Large arrow key).

f. _____ SELECT TANK-# START, AND

LISTEN for solenoid valves clicking indicating the system has engaged.

46. _____ REVERSE the pump, AND

PUMP line contents back into the tank through the *CONE BOTTOM VALVE*.

NOTE:	Close the valve while stopping the pump at the same time.

47. _____ STOP the pump, AND

CLOSE the *CONE BOTTOM VALVE.*

48. _____ CLOSE the *CIP BALL VALVE.*

Main Mead Batch Production

Initials

49. _____ DISCONNECT hoses from the Fermenting Vessel, AND

CONNECT CIP BALL hose to the drain header, THEN

CONNECT Cone Bottom hose to the 100 psi later line, AND

FLUSH hoses and Pump with water from the 100 psi water line to the drain header connection.

50. _____ SLOW the pump, THEN

Simultaneously CLOSE the 100 psi water valve and disconnect the hose from the Flowmeter, allowing the pump to unload the liquid in the lines to the drain header.

51. _____ PLACE the Blowoff Hose into the 5 Gallon bucket of StarSan.

52. _____ MARK on the Production Calendar for pitching on the next day.

53. _____ DISCONNECT, DRAIN, CLEAN and STORE equipment used in its designated stowage area.

NOTE:	Check the Yeast fridge (brewery area) for yeast. If the big silver bag of D47 is empty, then obtain a new bag from the 40 ft Conex, and return the open bag to the yeast fridge.

54. _____ AFTER a 24 hour wait, THEN

PITCH the batch with 1.75 kg of Lalvin D47 per Operating Procedure 15 *Batch Addition and Clarification* AND

RECORD it on the Batch Tracking Sheet.

55. _____ CONTINUE batch maintenance per the Batch Tracking Sheet.

Procedure Revision Summary

Revision	Document Change:
0	Initial release of document.
1	Pg 5 added bucket of StarSan. Pg 6 added Step CLOSE the tank *CIP BALL VALVE*.
	Pg 7 added VERIFY Set to “2 Batch”; VERIFY “LT” indicated in upper left to substeps.
	Pg 10 added note: Prior to stopping the water flow, STOP the Ozonator. Restart the Ozonator AFTER reestablishing water flow.
	Pg 10 added note: The Racking Cane Valve will need to be opened and closed as necessary during top off for gravity. Stop and Restart the Ozonator as necessary. Added step: CLOSE the *RACKING CANE VALVE*.
	Pg 13 added note Close the valve while stopping the pump at the same time.. Added steps: STOP the pump, AND CLOSE the *CONE BOTTOM VALVE.* CLOSE the *CIP BALL VALVE.*
	Pg 13 changed step 49 to 100 psi line and pump.
	Pg 13 added steps 51-52.
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