ALASKA AGRICULTURE INNOVATION GRANT REPORT:

OVERVIEW OF SOLAR HOT WATER SYSTEM FOR GREENHOUSE PRESENTATION

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The goal of the system we chose to install was designed to extend our season by providing supplemental space heating and increase our production by providing optimal soil temperatures for our tomato and cucumber crops.

I. A Brief Description of the system components:

A. -2 Vitosol F series flat panel solar collectors

B. -Vitodens 100 condensing boiler

C. -Solar Divicon pumping station

D. -Vitocell 100-B Direct Hot Water Tank 'battery' or the system

E. -Solar Control 'brains' of the system

II. Two heating zones: Non-toxic glycol heating loops

A. Raised Bed Zone: We laid pex tubing in the beds with 2" insulation below as well as perlite.

1. Goal was to heat soil to 70 degrees

2. We eventually achieved maintaining the soil between 65 - 70 degrees.

B. Concrete Walkway: We laid pex tubing above insulation and poured a concrete walkway.

1. Goal was to heat concrete walk and provide supplemental heat for greenhouse

2. We set the thermostat at 60 degrees for the system to send heat into the slab.

III. Did we extend our Season:

A. We did not get the system up and running until April 20th, so we did not get to run it early spring.

B. We did run the greenhouse until November 15th which is a couple weeks later than we normally do.

C. However we did not have much of a savings in natural gas usage compared to previous years operating with our forced air system.

D. The weather definitely could have played a factor in this as we had a rather cloudy summer.

E. So, hopefully we will achieve better results in the future.

IV. Did we increase our production:

A. Again we had a cloudy summer last year so it's hard to say yet.

B. We did not see a notably higher fruit set compared to previous years this year which likely could have been due to the weather.

C. Hopefully with some fine tuning of the system and nicer weather our results will be more positive in the future.

Conclusion:

As far as our first years results they do not seem so positve. There are many ways that we can adjust the system to hopefully work out the kinks. Time will tell if this is at all a viable and economical system for other Alaskan growers to implement, but I could not really say one way or the other for definite at this point.