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Studies are currently under way to explore the possibilities to utilize waste heat from a power plant located in Healy, Alaska, close to the Denali National Park, for heating a controlled environment agriculture facility. The water used for chilling is now returned at elevated temperature to the nearby Nenana River. Using waste heat from the power plant provides an opportunity to produce fresh vegetables and flowers throughout the year in this community. Preliminary market analyses indicate leafy vegetables as a suitable potential crop with local and state demand and markets.

An additional component of this project is high school and college level education. Plant production in controlled environments and greenhouse systems requires knowledge and training in many areas including engineering, math, physics and chemistry. Projects in controlled environments serve as an opportunity to implement classroom knowledge into contextual experiences. Several Alaska rural and urban high schools including Healy high school, have expressed an interest in incorporating controlled environment agriculture as part of the curriculum. Students introduced and exposed to various greenhouse production systems at the high school level are more likely to choose one of the many professional occupations within horticulture or related fields as a career. Currently, there is a lack of well-educated agricultural and horticultural professionals with many employment opportunities within the state. In addition, training in controlled environments prepares students for various other college majors and careers such as natural resources, biological sciences and engineering.

At high latitudes, limited amounts of natural light result in great reliance on primarily high pressure sodium (HPS) lamps to support winter greenhouse production with sufficient photosynthetic active radiation. The lack of blue and far-red wavelengths in HPS may cause slow development and flowering of some commonly grown crops. Various combinations of HPS and incandescent light are studied to determine the necessary threshold for “normal” plant development. The importance of adding blue light to balance the HPS light quality for good crop development will also be studied.

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