In greenhouse and controlled environments, advanced technologies are brought together with conventional systems for efficient year-round production of berry, vegetable, and floral crops. Ongoing research at the University of Alaska Fairbanks investigates plant requirements for maximum productivity in Alaska’s greenhouses. A current study has several objectives: develop cultural and management techniques for crops grown in controlled environments, including high tunnels, greenhouses, and totally controlled facilities; investigate production and capital costs and local market potential for crops produced in high tunnels; provide production protocols and techniques for high-tunnel and controlled environment production of berries and floral and vegetable crops, including how to efficiently plan, design, establish, manage, and operate a temporary or permanent controlled environment production unit. The principal investigator is UAF professor Meriam Karlsson.

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Wild berry photo courtesy of the U.S. Fish & Wildlife Service

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When United States Department of Agriculture listed the top 20 antioxidant-rich foods in a study of commonly consumed foods, berries took six of the top eleven spots: wild blueberries, cultivated blueberries, cranberries, blackberries, raspberries, and strawberries. Because University of Alaska Fairbanks (UAF) researchers have long suspected that long day lengths, cool soils, and sun angle affect plant characteristics such as color and sweetness, they also wondered how these growing conditions might affect the antioxidant capacity of fruits and other plants. If this capacity was elevated above that found in comparable cultivated and wild harvested plants at lower latitudes, Alaska plants and products might provide the raw materials for a growth agricultural industry in fresh, processed, and nutraceutical or pharmaceutical markets.

**Antioxidants in Alaska Wild Berries**

A survey of Alaska wild berries to determine the range of their antioxidant capacity showed that UAF researchers were right. When 88 berry samples were analyzed, all of the species tested showed elevated Oxygen Radical Absorbing Capacity levels.

**The Partnership**

A partnership has been formed between UAF, USDA ARS, and two private concerns, Alaska Blue and Alaska Berry Growers, to bring basic and applied science together with industry to further economic development in rural Alaska. The team aims to:

* foster sustainable businesses for Alaska’s rural communities;
* further investigative science through basic and applied research;
* provide educational opportunities for graduate and undergraduate students;
* develop new degree programs, and workforce training;
* bring new wealth to the state of Alaska through technology transfer and product development.

**UAF Research**

Because demand for nutraceuticals is high and people increasingly want healthy processed berry products and fresh berries of high quality, berry research underway at UAF ranges from biochemistry to horticulture. Commercial use of Alaska’s berries requires a consistent supply, so cultivation of berry crops is critical to supplement wild harvest. Under investigation are field management practices for wild stands, propagation technology for cultivated stands, and controlled-environment production technologies.

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* Journal of Agricultural and Food Chemistry, June 9, 2004