Phytochemical Content of Buckwheat Throughout the Growing Season


Standard Process products have significant anecdotal support. For over 80 years we’ve focused on safe ingredients that have a strong pedigree of use. Cutting edge, quality research allows us to accumulate more information on our raw materials and final products with an overarching goal of helping patients. We are assembling a body of solid data to support how our products are used, and to define how they could work even better. An example of this dedication to quality and research is our peer-reviewed article examining the phytochemical content of buckwheat from the sprout through seedling stage.
**INTRODUCTION**

Buckwheat is a rich source of nutrients. The seeds, leaves, and stems all contain a host of beneficial compounds.

These phytochemicals vary greatly over the life cycle of the plant and while rutin concentrations are well studied, little attention has been paid to the activity of other compounds that change throughout the phases of buckwheat growth.

For this reason, Standard Process researcher Dr. Brandon Metzger and his team designed a study to evaluate the chemical changes in buckwheat over a growing season.

**DESIGN**

Seeds were sown May 2007 in seven locations on the Standard Process certified organic farm.

Soil samples were taken for nitrogen and mineral analysis.

Plant samples (10+) were harvested weekly, and were frozen, freeze-dried, and then ground into a fine powder for testing.

Plant material was evaluated for the presence of:

- Lutein
- Rutin
- Beta-carotene
- Anthocyanins

Because these compounds are used by plants to protect from oxidation and other damage, antioxidant activity was measured with the FRAP and ORAC assays.

“This project looked at all stages of growth, from sprout emergence in the 2nd week, through the seedling stage and the harvest of mature buckwheat,” said Dr. Brandon Metzger, lead author of the paper.

Standard Process is unusual in our use of buckwheat; we value the complex, synergistic array of compounds in the plant as a whole over any one flagship phytochemical. Above: Buckwheat leaves and stems contain phytochemicals like rutin, carotenoids, vitamin E, and anthocyanins. Right: Buckwheat seeds supply protein, carbohydrates, and phytochemicals like quercetin and the fagopyritols.
The scientists concluded, based on the results and with consideration given to plant size and yield, that optimal harvest time is 4–5 weeks after sowing. “This is consistent with our current farm practices,” said Dr. Metzger. “Harvesting just prior to seed appearance in the late stage of growth, when environmental conditions allow, maximizes the whole plant as a raw ingredient.” Dr. Metzger cautioned, however, that this is only one year of data collection. “Because this project is ongoing, we will revisit this recommendation to verify that it remains accurate even among other buckwheat varieties.”

Dr. Metzger’s current research builds on his previous studies examining the effect of buckwheat protein on cholesterol uptake in a cell model that represents human intestinal cells.

**RESULTS**

Samples were taken starting 2 weeks after planting (sprouts) and continuing through the end of the growing season (week 9, seed darkening). Buckwheat began flowering around week 3 and the earliest seeds appeared 6 weeks after sowing. After week 8, the distinctive triangular seeds dried out and changed color.

Dr. Metzger and his team found:

- Buckwheat growth was highly variable depending on the time of year and field location
- No significant relationship was found between soil minerals and plant minerals, with one exception—higher soil amounts of manganese resulted in lower plant amounts of manganese, suggesting that a regulatory process acts to prevent plants from absorbing this mineral beyond a level needed for optimal growth
- ORAC values were highest between weeks 3 and 7
- FRAP values trended higher in the 3rd to 4th week but were not significantly different throughout the study
- Vitamin E and anthocyanin (measured by cyanidin) concentrations were stable throughout the study
- Rutin concentration peaked between weeks 4 and 5
- The carotenoids lutein and beta-carotene were measured throughout the growing season, and beta-carotene topped out at week 3 and steadily declined, while lutein concentration peaked at week 2 and steadily declined.

**CONCLUSION**

The scientists concluded, based on the results and with consideration given to plant size and yield, that optimal harvest time is 4–5 weeks after sowing.

“This is consistent with our current farm practices,” said Dr. Metzger. “Harvesting just prior to seed appearance in the late stage of growth, when environmental conditions allow, maximizes the whole plant as a raw ingredient.”

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Some Standard Process Products that Contain Buckwheat Seed, Leaf, and/or Juice

- Cataplex® A-C-P
- Cataplex® C
- Cataplex® GTF
- Cholaplex®
- Cyruta®
- Cyruta® Plus
- Ginkgo Synergy®
- Iplex®
- OPC Synergy®
- SP Green Food®