



Cereal grains that can be sprouted include wheat, rye, spelt, oats, barley, buckwheat, millet, and rice. In addition, there is a species called catgrass that is popular in some markets. Some cereal grains are sprouted hydroponically, using only water, as alfalfa and bean sprouts are commonly produced. Hydroponic sprouts carry considerable food safety concerns because of seed-borne diseases. Therefore, this publication will only describe two alternative methods of production: the bed method and the field method.

Bed Method

Seeds are grown in shallow beds made up of a mixture of soil and peat moss or vermiculite. This method begins with soaking the grain until the root radicle emerges from the seed coat. Seeds are then placed in the beds. The seeds grow in the dark at first and then, after two or three days, they are exposed to light.

Shallow trays are often used to grow these cereal “grasses.” Sometimes production is in a greenhouse. The greenhouse method begins with laying thermal tubing on top of polystyrene, which rests on the ground. This is covered with black plastic. Thermal tubing distributes heat from hot water heaters and functions as a root-zone heating system. Next, a layer of compost or soil-less potting mix is laid on top of the plastic about an inch deep. Soaked grains are spread on top of the compost-mixture so that each makes contact with the soil. The seeds are kept moist by watering, as needed. In a week the sprouted grains will be ready for harvest.

Harvest begins just before the second pair of leaves appears, usually about day eight. The result looks like a small, lush lawn. Sprouts are cut with either scissors or a knife just above soil level or are pulled out with the roots. If they are cut, there is often a second harvest during the next week. Detailed information about timing and temperature is given in the books on wheatgrass that are listed at the end of this publication. There is also considerable detail on the websites listed.

Careful attention to correct temperature, light, and moisture is critical for consistent harvests. However, the environment necessary for wheatgrass production is also favorable to the growth of fungal and bacterial contaminants. Therefore, sanitation during production and harvest is extremely important. If the seed will be consumed, there is a strict protocol to ensure a pathogen-free product. If the wheatgrass is to be cut, water quality is the main concern. In either case, proper postharvest storage temperature, handling, and packaging are critical. The product is very perishable.

Field-grown Wheatgrass

Pines International is a large cooperative in Lawrence, Kansas, that produces wheat grass juice tablets. This company distinguishes between the wheatgrass grown in beds and harvested at about one week to ten days and their product, harvested at a later stage of grass development when both stems and leaves have formed. They claim their product has more nutritional value because it is grown in soil for a longer time period. Contact Pines International (see **Further Resources** below) for educational materials, or refer to their website for further information about this method of production.

Sanitation

An increasing number of cases of foodborne illness have been traced to the consumption of raw sprouts. Contamination is often from the seed itself. *Salmonella*, *Bacillus cereus*, *Staphylococcus aureus*, and *Listeria* have been identified on seed coats. *Escherichia coli*, however, results from contaminated water or contact with manure from warm-blooded animals (rodents and birds) during seed storage.

The Food and Drug Administration (FDA) issued an advisory in August 1998 against eating raw sprouts, especially for children, the elderly, and those with compromised immune systems. Government regulations that apply to production processes and facilities are being examined and may become more stringent. At the very least, existing ones will be more strictly enforced. The FDA defines the growing of sprouts as food *processing*, not *agriculture*. Consequently, oversight of sprout production and production facilities is done by the FDA, rather than the USDA.

Up until now the FDA has focused more on the hydroponic production of sprouts than on soil culture. This does not, however, rule out the possibility of regulations in the future. To read about the FDA advisories, you may go to their website at: <http://www.fda.gov/> and use the search engine to search for sprouts and wheatgrass.

Beginners can learn about relevant regulations by contacting their state Department of Health Services. It would be wise to establish a cordial relationship with the local inspector. It would also be wise to know what inspectors can and cannot require of a commercial producer.

Liability

If illness or death is traced to a particular production facility, the owner can be sued. In addition, costs of investigation by the regulating agency can be charged to the company that owns that facility. One incident can easily destroy even a financially solid operation. It is, therefore, critically important not only that managers do everything to avoid contamination but also that they maintain records of seedlots, procedures, and proper training of employees involved in production. The health department is a resource for learning about legal requirements.

Liability insurance is a necessary cost associated with any type of food production. This is a difficult subject to understand, but it is essential to protect you and your business from situations that could be financially devastating. Two resources may help as you consult with your insurance agent about the coverage you need. Neil Hamilton's *The Legal Guide for Direct Farm Marketing* (1) is an excellent overview. In the liability chapter of this book he refers to another resource, *Understanding the Farmers Comprehensive Personal Liability Policy: A Guide for Farmers, Attorneys and Insurance Agents* (2). Both books are written in an easy-to-understand style.

Marketing

Before beginning any business, it is extremely important to develop a complete business plan. This includes learning about available markets and deciding on which you will use. Because your crop must be harvested fresh, it is likely that your markets will be nearby. ATTRA's publication *Evaluating a Rural Enterprise* provides information to assist in this process. *Direct Marketing* and *Organic Marketing Resources* are two others that might be helpful. You may call (800) 346-9140 and request these publications or download them from our website at <http://www.attra.ncat.org>.

Trade Organization

The International Sprout Growers Association (see **Further Resources** below) is the trade organization for producers of sprouts and sprouted grains. It publishes a newsletter and offers other services to members, including up-to-date news on legal and food safety issues related to the business. They also maintain an extensive website.

Further Information

Literature on sprouted grain technology and health benefits is listed in the **Further Reading** section below. These materials may be available to you through your land-grant university library or from the Inter-library Loan program of your local library.

If you have access to the World Wide Web, the Living and Raw Foods Bookstore (see **Further Resources**) specializes in this type of literature. The Web also offers a growing number of sites on this subject. Many are listed under "Electronic Resources" at the end of this publication.

References:

- 1) Hamilton, Neil D. 1999. The Legal Guide for Direct Farm Marketing. Drake University Agricultural Law Center. Des Moines, IA 50311. 235 p. ISBN: 0-9671556-0-6.
Available from Drake University for \$20.00. Call (515) 271-2065 for volume discounts of 20 copies or more.
- 2) Copeland, John. 1992. Understanding the Farmers Comprehensive Personal Liability Policy: A Guide for Farmers, Attorneys and Insurance Agents. National Center for Agricultural Law Research and Information. Fayetteville, AR. 147 p. ISBN: 1-882461-00-2.
Available for \$18 from:
NCALRI
107 Waterman Hall
Fayetteville, AR 72701
(479) 575-7646

Further Resources:

International Sprout Growers Association.

P.O. Box 2214

Amherst, MA 01004-2214

(800) 448-8006

(413) 253-8965

<http://www.sproutnet.com>

Trade organization for sprouted grain and sprouts producers.

Pines International

P.O. Box 1107

Lawrence, KS 66044

(785) 841-6016

<http://www.wheatgrass.com>

Cooperative that produces wheat grass using the field method

Living and Raw Foods Bookstore

A Web-based source for books and information

<http://www.living-foods.com/bookstore/sprouting.html>

On-line bookstore that specializes in books on sprouts and sprouted grains

Further Reading on Sprouted Grains [often available from seed sources]

Kulvinskis, Viktoras. Nutritional Values of Sprouts and Wheatgrass

Mayerowitz, Steve. Wheatgrass: Nature's Finest Medicine

Russell-Manning, Betsy. Wheatgrass Juice—Gift of Nature

Seibold, Ronald L. 1990. Cereal Grass: What's in it for You! Wilderness Community Education Foundation, Lawrence, KS. 142 p.

Wigmore, Ann. The Wheatgrass Book.

Electronic Resources:

Sprout People:

<http://www.sproutpeople.com/index.html>

Sells seed and equipment, includes information on production methods for 80 seeds, equipment and its care, a kids section, food safety information, cookery, and benefits.

Wheatgrass Kits:

<http://www.wheatgrasskits.com>

Extensive information on sprouted grains, including medical references, history, testimonials, archived newsletter, uses, and nutrition.

Handy Pantry's Wheatgrass section:

<http://www.handypantry.com/grow.htm>

Describes both tray method and soil method of growing grains and grasses; sells the equipment and the seeds.

Go Green Organization:

<http://www.gogreen.org>

Information about health benefits, production equipment for sale.

Rosicrucian Fellowship:

<http://www.rosicrucian.com/zineen/pamen043.htm>

How to sprout and health benefits.

Sweet Wheat:

<http://www.sweetwheat.com/qa.htm>

Information about health benefits.

Raw Resources:

<http://www.geocities.com/chlorophil.geo/rawresources.htm>

Maintains links to many sources of sprouts, sprout information, and sprouting supplies.

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The electronic version of **Wheatgrass Production**
is located at:
HTML
<http://www.attra.ncat.org/attra-pub/wheatgrass.html>
PDF
<http://www.attra.ncat.org/attra-pub/PDF/wheatgrass.pdf>

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