Crop Profile for Beans in Oregon

Prepared: August, 1999
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General Production Information

- Oregon is second in the nation in common bean production. (Wisconsin is first.) Common beans include snap beans, green beans, Blue Lake beans, pole beans, and bush beans. Most Oregon beans are Blue Lake varieties.
- Oregon bean farmers grow 20.2% of the U.S. total production.
- In 1997, growers harvested 20,780 acres for over 140,000 tons of beans valued at $33,109,000. When the price per ton dropped in 1998 (as did the tonnage), the crop value dropped to $27,119,000.
- Willamette Valley production costs totaled $1,016.60 per acre in 1995, although this figure may be high.
- Almost all Oregon beans are processed.

Production Regions

The Willamette Valley is the primary bean-growing region; however, over 1,000 acres grow along the Columbia River in Umatilla County. Marion County growers have the largest acreage at 11,870 acres, followed by Benton, Lane, Linn, Yamhill, Washington, and Polk County (2).

Cultural Practices

The average time from bloom to harvest is about 22 days. Bush beans have largely replaced pole beans on commercial farms to allow mechanized harvest (6).

Oregon bush bean farmers irrigate with overhead sprinklers. These can be stationary guns, rolling wheel lines, hand lines, traveling reel lines, linear lines, or center pivots (5,7).

Insect Pests

Some of the insects that infest bean fields are aphids, cutworms, beetles, garden symphylan, grasshoppers, lygus bugs, weevils, maggots, slugs, spider mites, stinkbugs, and wireworms (8).

Chemical controls:
Bean farmers used these insecticides in 1993: B.t. (Javelin), carbaryl (Sevin), chlorpyrifos (Lorsban), diazinon (Diazinon), dimethoate (Cygon), disulfoton (Di-Syston), esfenvalerate (Asana), ethoprop (Mocap), malathion

(Cythion), metaldehyde (Deadline), and methoxychlor Marlate). Carbaryl had the greatest use (5,9).

In 1997, growers applied 38,200 pounds of insecticides to 85% of the planted acres (10).

In 1998, Oregon farmers reported use of the following insecticides (11):

Insecticide	Brand name	Area treated (%)	Number of applications	Pounds per acre per application	Pounds per acre per crop year	Total application (by 1,000 lb)
carbaryl	Sevin	56	1.0	0.79	0.86	11.2
esfenvalerate	Asana	8	1.1	0.04	0.05	00.1
ethoprop	Mocap	59	1.0	2.14	2.14	29.7

Of particular interest are 1999 estimates of organophosphate and carbamate use, which show not only significant diazinon and ethoprop use but some fonofos (Dyfonate) spraying. Fonofos is no longer a supported registration (12,13).

The largest amount of insecticide use is to control Diabrotica beetles. This beetle can kill bean plants in the early stages of growth. In addition, from pin bean stage through harvest, the adult beetles bite the bean pods, which creates dark, ulcerated areas on the pods (5).

For more details on insect control in Oregon beans, see the 1999 PNW Insect Control Handbook, pages 54–56. (Go to http://eesc.orst.edu/agcomwebfile/edmat/ for ordering information.)

Cultural controls:
Specialists scout 87% of the vegetable crops for pests. Growers rotate crops to control pests on 69% of the acreage. They also use alternate pesticides on 68% of the acres to prevent resistance. Treatment modes on acreage can overlap (14).

Umatilla County farmers plant only curly top-resistant varieties (15).

Biological controls:
Bean farmers use a bioinsecticide (Mattch) to control armyworms and cutworms. The product is an encapsulated delta endotoxin of B.t. and killed *P. fluorescens* (8).

Diseases

Brown spot, yellow vein, root rot, rust, and gray and white mold afflict Oregon bean crops as does bean mosaic disease (5,19).

Chemical control:
Fungicides used on Oregon beans in 1993 were benomyl (Benlate), captan (Captan), chlorothalonil (Bravo), DCNA (Botran), iprodione (Rovral), maneb (Maneb), metalaxyl (Ridomil), streptomycin (Agri-strep), thiophanate-methyl (Topsin-M), thiram (Thiram), vinclozolin (Ronilan), and ziram (Ziram). Oregon growers applied vinclozolin in the largest amounts (5,9).

Growers applied 13,000 pounds of fungicide to 86% of the planted acres in 1997(10).

In 1998, Oregon farmers reported use of the following fungicides (11):

Fungicide	Brand name	Area treated (%)	Number of applications	Pounds per acre per application	Pounds per acre per crop year	Total application (by 1,000 lb)
metalaxyl	Ridomil	20	1.0	0.19	0.19	0.9
vinclozolin	Ronilan	91	1.0	0.5	0.54	11.5

For more details on disease control in Oregon beans, see An Online Guide to Plant Disease Control at http://pnwhandbooks.orst.edu/guide1998/index.htm (20).

Cultural controls:
Water management is crucial to mold control. Irrigation cut-off times of noon or earlier allow about 9 hours for the foliage and ground top to dry (7).

In addition, growers use these cultural controls to control molds:

- Rotating beans to cereals and corn for a least 2 years
- Orienting bean rows in the direction of the prevailing winds
- Plowing deeply to bury sclerotia before planting
- Providing adequate aeration between and within rows (19).

Bean growers should avoid planting in fields that contain residues of lettuce, carrots, cabbage, parsnips, potatoes, tomatoes, and cucurbits, since these crops may harbor white mold (15).

Biological controls:
A strain of *Trichoderma harzianum*, Bio-Ag 22G or T-22 Planter Box, is registered for use as root-disease control. Growers apply it to seeds at planting, but its efficacy is unknown (19, 21).

Some growers use seed treated with *Bacillus subtilis* (Kodiak), but results have been inconsistent (5).

Post harvest:
Farmers achieve post-harvest control of white mold by rapidly cooling the beans and storing them at 45–50 ° F (19).

Beans stored too long or at too high a storage temperature are subject to various decays, including water soft rot, cottony leak, gray mold, and rhizopus rot (15).

Nematodes

Chemical controls:
Farmers use fungicides, insecticide-treated seed, and ethoprop (Mocap) in their attempts to control nematodes (5,15).

For more details on nematode control in Oregon beans, see An Online Guide to Plant Disease Control at http://pnwhandbooks.orst.edu/guide1998/index.htm (20).

Weeds

Growers apply weed-control products to beans in preplant incorporation, pre-emergence soil-applications, and post-emergence treatments (16).

Some of the troublesome weeds in Oregon are pigweed, black and hairy nightshade, lambsquarters, smartweed, and proso millet (17).

Chemical controls:
In years past, farmers applied these herbicides to beans: bentazon (Basagran), chloramben (Amiben), dinoseb (Premerge), EPTC (Eptam), glyphosate (Roundup), lactofen (Cobra), metolachlor (Dual), paraquat (Gramoxone), pendimethalin (Prowl), profluralin (Tolban), sethoxydim (Poast), and trifluralin (Treflan). Chloramben, dinoseb, and profluralin are no longer used. The herbicide used in the greatest quantity was EPTC (9, 17).

Growers spray glyphosate (Roundup) if there is a cover crop or if there is an excess of winter weeds. At preplant, farmers incorporate trifluralin (Treflan) and EPTC (Eptam) at moderate rates. They also apply metolachlor (Dual) and sometimes lactofen (Cobra) at low to moderate rates preemergence. A post-emergence grass herbicide such as oryzalin (Surflan) suppresses proso millet (17).

In 1996, Oregon bean farmers used 108,200 pounds of herbicides on 96% of the acres (10).

Oregon farmers reported use of the following herbicides in 1998 (11):

Herbicide	Brand name	Area treated (%)	Number of applications	Pounds per acre per application	Pounds per acre per crop year	Total application (by 1,000 lb)
bentazon	Basagran	32	1.0	0.88	0.89	6.7
EPTC	Eptam	95	1.0	3.51	3.51	77.5
glyphosate	Roundup	19	1.0	0.68	0.70	3.0
lactofen	Cobra	24	1.0	0.12	0.12	0.7
metolachlor	Dual	58	1.0	1.32	1.48	20.1
trifluralin	Treflan	49	1.0	0.52	0.52	6.0

For more details on weed control in Oregon beans, see Snap Beans Herbicides at http://www.orst.edu/dept/hort/weeds/beans.htm (18).

Cultural controls:
Some growers use flaming to control weeds (16).

In areas where river rocks are not a hindrance, growers run a rotary cultivator over the field or cultivate between rows. Where rocks are large and interfere with harvest, farmers rely on herbicides. Crop rotation with grass seed or wheat is a standard practice because these crops exhibit different cropping patterns. Row spacings have been narrowed during the past decade to minimize weed emergence between the rows (17).

Post harvest:
Total integration and management of the crop production system achieve acceptable weed control in beans. The harvested and processed product needs to be contaminant free from debris such as nightshade or pigweed stems (17).

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