

**PESTICIDE USE  
IN  
POTATO AND GRAIN PRODUCTION  
IN ALASKA, 1981**

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## Introduction

In 1981 a survey was conducted to determine the kinds and amounts of pesticides used in the production of potatoes and small grains in Alaska as well as the manner in which they were used. Alaska has been asked by the United States Department of Agriculture to cooperate with the other states in a pesticide impact assessment program designed to aid the Environmental Protection Agency in predicting the consequences of its actions. This study was initiated to determine the importance of pesticides to the production of these crops.

Data were collected in July 1981 through personal interviews with growers. Nine potato growers from the Matanuska Valley and the Kenai Peninsula were contacted which represented 289 acres or 49 per cent of the 1981 potato acreage. Twenty-five grain growers from Delta Junction, the Matanuska Valley, and the Kenai Peninsula were interviewed. The percentages of surveyed acreage for each area follow closely production statistics for the year. These produced 3941 acres of barley, 1917 of oats, and 45 of wheat. All barley was grown for either feed grain or seed except for 50 acres which were grown for hay. Of the 16,500 acres of barley planted in the state, only 6,500 were harvested for grain. This survey represents 24 per cent of the acreage planted to barley. Six thousand acres of oats were planted. Of these, 500 were harvested for grain. Surveyed growers reported 689 acres were being grown for grain or seed or 11 per cent of the planted acreage. The remaining 682 acres were grown for hay or silage. Growers also reported the production of wheat on 45 acres. Acreages for oat hay or silage production for the state are not available.

For each crop, growers were asked to supply the following information:

- 1) number of acres planted to that crop,
- 2) names of pesticides used on that crop,
- 3) number of acres treated with each material,
- 4) formulation of the material used,
- 5) application rate used,
- 6) number of applications made during the season,

- 7) date of treatment,
- 8) method of application,
- 9) type of application equipment used,
- 10) specific target organisms,
- 11) effectiveness of materials against those targets,
- 12) apparent damage to crops as a result of pesticide use,
- 13) whether the material was applied by the grower or by a commercial applicator,
- 14) training and certification of the applicator.

This compilation is not intended to present recommendations for pest management situations in Alaska, and it should not be used as a pest-control guide. It simply reports surveyed information and should be used only as a reference to pesticide usage in 1981. Some general information is provided on the classification and application of each pesticide.

Table 1. Quantities of pesticides used in potato and grain production in Alaska 1981.

Potatoes (289 acres surveyed):				
Pesticide	Land treated (acres)	Surveyed acreage (%)	Amount used (lbs. a.i.)	Total pesticide use (%)
Captan	39.0	13.5	—	—
Dinoseb	167.7	57.8	638.5	46.1
Eptam	55.0	19.0	96.3	7.1
Glyphosate	43.0	14.9	70.4	5.2
Metribuzin	100.0	34.6	500.0	36.7
PCNB	5.0	1.7	58.5	4.3
Thiabendazole	100.0	34.6	8.9	0.7
Trifluralin	1.5	0.5	1.5	0.1
No Treatment	2.2	7.6		

Barley (3941 acres surveyed)

Banvel	55.0	1.4	6.9	0.6
Bromoxynil	80.0	2.0	40.0	3.4
2,4-D	280.0	7.1	191.0	16.4
Dinoseb	94.0	2.4	142.3	12.2
Lindane	200.0	5.1	4.7	0.4
Maneb	400.0	10.1	—	—
Trifluralin	1.5	0.1	1.5	0.1
Vitavax <sup>a</sup>	3,116.0	79.1	779.0	66.8
No Treatment	15.0	0.4		

Oats (1971 acres surveyed)

Banvel	72.0	3.8	6.6	1.1
2,4-D	170.0	8.9	175.0	27.9
Dinoseb	22.0	1.2	49.0	11.4
Glyphosate	6.5	0.3	15.0	3.5
Maneb	70.0	3.7	—	—
Vitavax <sup>a</sup>	965.0	50.3	241.3	56.1
No Treatment	750.0	39.1		

Wheat (45 acres surveyed)

Banvel	8.0	17.8	0.4	1.7
Dinoseb	2.0	4.4	6.0	25.9
MCPA (Ronox)	8.0	17.8	8.0	34.5
Vitavax <sup>a</sup>	35.0	77.8	8.8	37.9
No Treatment	0.0	0.0		

<sup>a</sup> Growers and seed dealers were unable to give the formulation of Vitavax used, nor the seeding rate. Vitavax is a product name which generally refers to a formulation of carboxin but may also indicate a product which combines carboxin with either thiram (Vitavax 200) or captan (Vitavax 300). For the purposes of this survey, Vitavax is considered to be a 75 per cent active ingredient formulation seed protectant, and no attempt was made to separate it into A.I. components. An average seeding rate of 90 lbs/A was assumed.

Table 2. Use of pesticides.

Potatoes:	Application		Formu- lation <sup>a</sup>	Number	Method <sup>b</sup>	Time <sup>c</sup>
	rate X	(no.a.i./A) mode				
Captan	—	—	D	1	1	
Dinoseb	3.5	3	E.C.	1	3	D
Eptam	1.7	1.7	E.C.	1	3	A
Glyphosate	1.6	1.3	E.C.	1	3,7	A,C
Metribuzin	5.0	5.0	E.C.	1	3	C
PCNB	10 lb/12400 ft. of row		E.C.	1	5	B
Thiabendazole	0.4 oz./2000 tubers				1 <sup>d</sup>	A
Trifluralin	1.0	1.0	E.C.	1	3,6	A
Barley:						
Banvel	0.12	0.12	E.C.	1	3	D
Bromoxynil	0.5	0.5	E.C.	1	3,4	D
2,4-D	0.7	0.8	E.C.	1	3	D
Dinoseb	1.5	0.9	E.C.	1	3	D
Lindane	0.04	0.04	D	1	1,2	A
Maneb	—	—	D	1	1,2	A
Trifluralin	1.0	1.0	E.C.	1	3,6	A
Vitavax	2.25	—	F?		1	A
Oats:						
Banvel	0.1	0.1	E.C.	1	3,4	D
2,4-D	1.0	0.5	E.C.	1	3,4,8	D
Dinoseb	2.2	1.25	E.C.	1	3	D
Glyphosate	2.3	2.0	E.C.	1	2	previous fall
Maneb	—	—	D	1	1,2	A
Vitavax	0.25	—	F?	1	1	A
Wheat:						
Banvel	0.05	0.05	E.C.	1	2,6	D
Dinoseb	3.0	3.0	E.C.	1	2	
MCPA	1.0	1.0	E.C.	1	2,6	D
Vitavax	0.25	—	F?	1	1	A

<sup>a</sup>D. Dust

E.C. Emulsifiable Concentrate  
F. Flowable

<sup>b</sup>1. Seed treatment

2. Drill box application

3. Broadcast

4. Controlled droplet

5. Injection

6. Soil incorporation

7. Spot application

8. Aerial application

<sup>c</sup>A. Preplant

B. At planting

C. Preemergence

D. Postemergence

<sup>d</sup>Seed pieces dipped



Table 3. Continued.

Oats:

Banvel	2	A	A	P	A	A	P-A			none
2,4-D	3	P	A	P	A	P-A	P-A	P		none
Dinoseb	3	A				A	A	A		none to leaf burn none
Glyphosate	1								A	none
Maneb	0									
Vitavax	1									P

Wheat:

Banvel	2	P-A			A		A		X		none to leaf curl
Dinoseb	1	A									none
MCPA	1	P-A				A	A		X		none
Vitavax	1									P-A	none

<sup>a</sup>Number of growers indicating specific pest targets.

<sup>c</sup>A = Adequate, good  
P = Inadequate, poor  
X = No control

<sup>b</sup>A = Chickweed (*Steltaria media* [L.] Cyrillo)  
B = Fireweed (*Epilobium angustifolium* L.)  
C = Hemp nettle (*Galeopsis tetrahit* L.)  
D = Knot weed (*Polygonum* spp.)  
E = Lambsquarters (*Chenopodium album* L.)  
F = Mustards, rape (*Brassica* spp.)  
G = Pig weed (*Amaranthus retroflexus* L.)  
H = Pineapple weed (*Matricaria matricarioides* [Less.] Porter)

I = Quackgrass (*Agropyron repens* [L.] Beauv.)  
J = Wild Buckwheat (*Polygonum convolvulus* L.)  
K = Rhizoctonia  
L = Scab (*Streptomyces scabies* (Thaxten) Waksman & Henrici)  
M = Scald (*Rhynchosporium secalis*)  
N = Smut (*Ustilago* spp.)  
O = Stripe (*Drechslera graminea*)



## Index to Pesticides

Banvel – Herbicide.

Other name: Dicamba.

Application: For control of annual and perennial broadleaf weeds in small grains, rangeland, pasture, turf and noncropland.

\*LD<sub>50</sub>: 2629 mg pesticide/kg body weight

BMC – see Lindane.

Bromoxynil – Selective herbicide.

Trade name: Buctril.

Application: For postemergent control of seedling broadleaf weeds in wheat, oats, barley, rye, grass for sod seed production, turf and non-crop areas.

LD<sub>50</sub>: 779 mg pesticide/kg body weight

Buctril – see Bromoxynil.

Captan – Protectant-eradicator fungicide.

Other name: Orthocide.

Application: Control of a wide variety of fungus diseases on small fruits, berries, vegetables, and ornamental crops. Used as a seed treatment by slurry, dry treatment, and plant-box application. (See also Vitavax.)

LD<sub>50</sub>: 9000 mg pesticide/kg body weight

Carboxin – see Vitavax.

2,4-D – Selective herbicide.

Application: Registered for use on grasses, wheat, barley, oats, corn, sugarcane, and noncrop areas for postemergent control of weeds such

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\*LD<sub>50</sub> mg pesticide/kg body weight = oral acute lethal dosage for tested mammals.

as Canada thistle, dandelion, annual mustards, ragweed, and lambs-quarters.

LD<sub>50</sub>: 300-1200 mg pesticide/kg body weight

D. B. Green — Seed protectant. (see Lindane and Maneb).

Combination of Lindane (18%) and Maneb (50%) in a powdered formulation.

Dicamba — see Banvel.

Dinitro — see Dinoseb.

Dinoseb — Selective herbicide.

Other names: Dinitro, Premerge.

Application: Selective contact control of weeds in alfalfa, clover, birds-foot trefoil, onions, peas, and small grains. Preemergence treatments control germinating seeds in upper soil layers.

LD<sub>50</sub>: 40-60 mg pesticide/kg body weight

Eptam — Selective herbicide.

Application: For use in potatoes, beans, and forage legumes for the control of annual grassy and broadleaf weeds and perennial weeds such as Johnson grass seedlings and quackgrass.

LD<sub>5</sub>

LD<sub>50</sub>: 1325-1500 mg pesticide/kg body weight

Glyphosate — Nonselective, postemergence herbicide.

Other name: Roundup.

Application: A foliar-applied, translocated herbicide, for control of many annual and perennial grasses, broadleaf weeds, and many tree and woody-brush species in cropland and noncrop sites.

LD<sub>50</sub>: 4300 mg pesticide/kg body weight

HCH — see Lindane.

Lindane – Insecticide.

Other names: BHC, HCH.

Application: Predominantly used as a seed treatment. Formulated in combination with Maneb (see D.B. Green).

LD<sub>50</sub>: 88-125 mg pesticide/kg body weight

MCPA – Herbicide.

Other name: Ronox.

Application: A translocated herbicide for postemergent control of many annual and perennial broadleaf weeds in small grains, peas, grassland, turf, and noncrop areas.

LD<sub>50</sub>: 700-800 mg pesticide/kg body weight

Mertect – see Thiabendazole.

Metribuzin - Herbicide.

Other name: Sencor.

Application: For control of many grassy and broadleaf weeds in potatoes, wheat, barley, peas, alfalfa, and other crops.

LD<sub>50</sub>: 1100-2300 mg pesticide/kg body weight

Orthocide – see Captan.

Premerge – see Dinoseb.

Ronox – see MCPA.

Roundup – see Glyphosate.

Sencor – see Metribuzin.

Thiabendazole – Systemic fungicide.

Other name: Mertect.

Application: For control of *Fusarium* (dry rot) in potato storage as well as protection against numerous fungal diseases on other crops.

LD<sub>50</sub>: 3100 mg pesticide/kg body weight

Thiram – see Vitavax.

Treflan — see Trifluralin.

Trifluralin — Selective preemergence herbicide.

Other name: Treflan.

Application: For control of annual grasses and certain broadleaf weeds in numerous crops including potatoes, small grains, Brassicas, and many others. Will not kill established weeds and must be incorporated into top 2-3 inches of soil within 24 hours of application.

LD<sub>50</sub>: greater than 10,000 mg pesticide/kg body weight

Vitavax — Systemic fungicide, seed protectant.

Common name: Carboxin.

Application: Control of diseases on seedlings and smuts on barley, oats, wheat, and other crops. Vitavax may also be formulated in combination with Thiram or Captan (1:1).

LD<sub>50</sub>: 3820 mg pesticide/kg body weight

### Applicators

Pesticide applications other than seed treatments, including one 70-acre field of oats which was aerially treated with 2,4-D, were reported by growers. These applications were made either by the growers themselves or by others under their supervision. Eighty-six per cent of these reported that they held a private or commercial pesticide applicators license issued by the Alaska Department of Environmental Conservation. Seventy-one per cent reported that they had participated in a training program for pesticide use. Of these 70 per cent completed the training program offered by the D.E.C. Experience of 20-30 years was cited as a substitute for formal training.

All treatments of Vitavax on oat seed were made off the farm by seed suppliers as a matter of routine before purchase by growers. Eighty-four per cent of all barley seed treatments or 95 per cent of Vitavax treatments were made off the farm prior to purchase. In some instances, growers stated that the availability of only treated seed resulted in pesticide use when normally it would not be required.

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