WASHINGTON STATE UNIVERSITY
TRI-CITIES

October 3, 2003

Colwell S. Cook
US Environmental Protection Agency
7503C USEPA Headquarters Ariel Rios Building
1200 Pennsylvania Avenue, NW
Washington, DC 20460

In response to your request, the USDA Western Region Integrated Pest Management Center provides the following information with respect to alternatives to the use of dimethoate on succulent beans and succulent peas in the six-state region of Alaska, Idaho, Montana, Oregon, Utah, and Washington. Attached to this response is a contact list should you want additional information.

I was able to find two insecticide efficacy studies, both conducted by Washington State University researchers. The first, by Dr. Doug Walsh, addresses Western flower thrips control. The second, on pea aphid control, was conducted by Dr. John Stark. Reports outlining these studies are attached.

In my discussions with growers, fieldmen, Extension personnel, and researchers regarding the use of dimethoate on succulent beans and peas, three reasons for choosing dimethoate over other alternative control measures were cited: cost, efficacy, and the short pre-harvest interval. Cost and efficacy were mentioned in every discussion that I had on this subject but the pre-harvest interval (PHI) is also very important. In our earlier phone conversation you mentioned the possibility of extending the PHI to 20 days. I want to emphasize that a change of this magnitude to the dimethoate labeling is tantamount to cancellation for our uses. Growers have stated that dimethoate would still be useful in succulent bean and pea production if the PHI were extended to 14 days.

Before discussing the alternatives by crop I want to comment on the inclusion of lambda-cyhalothrin (Warrior) in the list of dimethoate alternatives. Syngenta only recently distributed a supplemental label that provides for the use of this product on beans and peas. The label was printed July 30, 2003, distributed to the state departments of agriculture on August 11, 2003, and became generally available for distribution on August 14, 2003. In our region, succulent bean harvest had begun by this time and the harvest of succulent peas was already complete. This explains why growers are not using this chemical as an alternative to dimethoate.

Costs
Cost is a critical factor in growers' choice of dimethoate. I contacted a chemical distributor (Wilbur Ellis) in the Skagit Valley area and asked for the prices of dimethoate and for the list of suggested alternatives.

Washington State Pest Management Resource Service • http://wsprs.wsu.edu
2710 University Drive, Richland, WA 99352-1671
509-372-7492 • Fax 509-372-7491

Using the application rates that growers previously reported to me and the labeled usage rates for the alternatives, I arrived at the following costs (materials only) for chemical application to beans and peas.

beans: **dimethoate, $4.81/A**;
acephate, $8.91 to $17.96/A;
imidacloprid, $14.22/A;
disulfoton, $13.13 to $26.26/A;
oxydemeton methyl, $21.25;
methomyl, $2.94 to $4.88;
bifenthrin, $16.40 to $20.50;
zeta-cypermethrin, $5.39 to $7.73; and
lambda-cyhalothrin; $5.78 to $8.67/A;

peas: **dimethoate, $1.59/A**;
imidacloprid, $14.22/A;
bifenthrin, $6.72 to 20.50;
disulfoton, $13.13 to $32.81;
malathion, $5.81 to $7.75;
zeta-cypermethrin, $5.39 to $7.73; and
lambda-cyhalothrin, $5.78 to $8.67/A.

While some of the alternatives for dimethoate use on beans compare favorably to the cost of dimethoate, the least expensive alternative to dimethoate for use on succulent peas is nearly four times the cost of dimethoate.

Beans

In our previous two responses, we reported that growers in our area use dimethoate mainly for the control of lygus and aphid in lima beans and snap beans. Growers have used acephate (Orthene) for worm control in lima beans but are not using it for lygus control. Imidacloprid (Admire/Gaucho/Provado) has been reported to be ineffective for lygus control. (The Provado label only lists lygus suppression in cotton.) Growers have had some experience with bifenthrin (Capture). Fieldmen will recommend bifenthrin if a grower needs to control both lygus and mites. While bifenthrin is more expensive than dimethoate, it becomes cost effective if the choice is between one application of bifenthrin or separate applications of both dimethoate and a miticide such as Kelthane. Researchers have reported good initial results with zeta-cypermethrin, although they are concerned about resistance development with both zeta-cypermethrin and lambda-cyhalothrin as there is documentation that lygus rapidly develop resistance to pyrethroids. If dimethoate use on succulent beans is lost, growers will most likely switch to using bifenthrin in its place.

Peas

In succulent peas, dimethoate is used for the control of aphids and pea leaf weevil. In sugar snap peas, dimethoate is primarily used to control thrips and is sometimes needed for aphid control. In the sugar snap peas, because thrips reside deep within pea flowers, they can't be controlled with a contact spray and growers need a systemic chemical for this use.

In 2002 in northeastern Oregon and southeastern Washington, pea growers experienced the worst problem with pea aphids that they have seen in over 30 years. Effective controls for aphids are important to this industry not just because of the damage that aphids directly cause to the crop but also because of the potential for aphids to vector diseases. In our region peas are a low-margin crop where growers may

show a profit in two years out of three and where they lose money or break even the remaining year. One fieldman reported that in the last three or four years no one made any money on peas because yields were low due to adverse weather conditions. I mention this to emphasize the importance to the pea industry for both effective controls and the need to keep input costs down. If input costs are not carefully controlled on this low-margin crop, then growers will lose money on every acre of peas grown. One fieldman with Twin City Foods stated, "Even though alternative insecticides may only add ten dollars per acre to our production cost, that may be the straw that breaks the camel's back." Because of the low cost of dimethoate and because of its effectiveness, it is a critical tool in pea production in our region. Additional information on cost/price issues is available in the publication *Crop Profile for Peas (Green) in Idaho* (http://pestdata.ncsu.edu/cropprofiles/docs/IDpeas-green.html) and in the attached document *Are Processed Green Peas in the Blue Mountain Region of Northeastern Oregon and Southeastern Washington Economically Sustainable?* This second document, prepared by Oregon State University Extension Agent Tom Darnell, was a handout at a presentation he made at a green pea seminar in January of 2002.

Besides cost and efficacy, other factors play a role in growers' choices. As stated in both of our previous comment letters on this subject, because of the application timing (i.e., after row closure) growers require an insecticide for aphid control that can be applied by air; using ground equipment damages the crop. Also, many of the pea growers in the Skagit Valley area are producing pea hay following harvest. This is an important economic advantage to them. (Dimethoate labels vary. Most prohibit the use for feed when a mobile viner is used, however, one label allows feeding of pea hay if at least 21 days has elapsed since the dimethoate application.)

Besides being cost prohibitive, imidacloprid is not a good dimethoate substitute for other reasons. According to the Provado label, this product is not effective for heavy aphid populations. Also, according to Dr. Doug Walsh, while imidacloprid effectively controls some types of thrips it is not an effective control tool for Western flower thrips, the pest of concern in sugar snap pea production. Finally, Dr. Walsh also indicated that there are some efficacy issues associated with imidacloprid when it is aerially applied.

Growers have reported that bifenthrin is also cost prohibitive and some have found that it isn't consistently efficacious in aphid control.

According to EPA's July 2002 IRED for disulfoton, this chemical is not an alternative to dimethoate in peas because the pea uses have been deleted from the registration.

Many problems were reported with using malathion in peas. Growers, fieldmen, and researchers felt that there were efficacy issues involved with the use of malathion for aphid control in peas. Extension personnel and researchers reported that the efficacy of malathion is temperature-dependent; warm temperatures are required for good control. Aphid control in Pacific Northwest peas is needed in the spring when temperatures are cool and thus malathion is not an acceptable alternative. Further, malathion labels prohibit application within seven days of harvest if the vines are to be used for feed.

Some growers have used zeta-cypermethrin (Mustang) as a cleanup spray. Although zeta-cypermethrin is one of the more reasonably priced dimethoate alternatives, all the fieldmen and growers commented on the cost of this chemical being more than three times the cost of dimethoate. Three of the fieldman reported that while zeta-cypermethrin was effective for lepidoptera pests, it was weak on aphids. Another fieldman reported that this chemical was slower to act than dimethoate and less effective.

As stated earlier, Syngenta has just come out with a supplemental label that provides directions for the use of lambda-cyhalothrin (Warrior) on both peas and beans. This label was distributed after the harvest of

succulent peas was complete. One fieldman who had used this chemical in corn expressed his concern that it was too hard on beneficial predator insect populations.

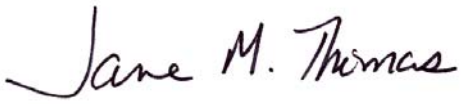
As with beans, there is a serious concern with the use of either zeta-cypermethrin or lambda-cyhalothrin on peas regarding pest resistance development. Extension Agent Tom Darnell reported that this year both Warrior and Mustang failed to control thrips in onions, a change he attributed to resistance.

Another dimethoate alternative mentioned by fieldmen and Extension personnel was esfenvalerate (Asana) but they reported that they had not achieved good control with this chemical. Tom Darnell felt that the control failure was due to resistance development but went on to state that no testing had been done to confirm this. Further, esfenvalerate also carries a feeding restriction that would prohibit growers from making pea hay.

When asked, Extension personnel, growers, and fieldmen indicated that if dimethoate use on peas were lost growers would switch to bifenthrin (multiple applications may be necessary), zeta-cypermethrin, or lambda-cyhalothrin. Dr. Doug Walsh stated that, "losing dimethoate on sugar snap peas may be an industry-ending event." When asked about alternatives if dimethoate use is lost, all expressed concerns about the costs of the alternatives.

I hope that you find this information helpful. Please feel free to contact me if you have further questions.

Sincerely,



Jane M. Thomas
Pacific Northwest Coalition Comment Coordinator
Washington State Pest Management Resource Service
Washington State University Tri-Cities
2710 University Drive
Richland, WA 99352
phone: 509-372-7493 fax: 509-372-7491
e-mail: jmthomas@tricity.wsu.edu

Contact List for Dimethoate Use Alternatives -
Succulent Beans Peas

Crop:	Last Name:	First Name:	Organization:	State:	Phone:	E-Mail Address:
pea, succulent	Boob	Ed	Hush & Hush Fertilizer Co.	Washington	(509) 728-5555	
pea, succulent	Darnell	Tom	Oregon State University	Oregon	(541) 938-5597	thomas.darnell@oregonstate.edu
pea, succulent	Dudley	Rick	Twin City Foods	Idaho	(208) 743-5568	rickd@twincityfoods.com
pea, succulent	Fickett	Bill	Symons Frozen Foods	multiple	(503) 860-5869	wfickett@earthlink.net
bean, succulent	Gill	Jim	Norpac Foods	Oregon	(503) 769-2101	gill@norpac.com
pea, succulent	Gill	Jim	Norpac Foods	Oregon	(503) 769-2101	gill@norpac.com
pea, succulent	Heideman	Aaron	Hermiston Foods	Oregon	(541) 567-8448	aaronh@norpac.com
bean, succulent	Knudson	Chris	Twin City Foods	Washington	(509) 962-9806	knudson@elltel.net
pea, succulent	Knudson	Chris	Twin City Foods	Washington	(509) 962-9806	knudson@elltel.net
pea, succulent	Lupo	Annette	JR Simplot	Washington	(509) 787-4521	annette.lupo@simplot.com
bean, succulent	McReynolds	Bob	Oregon State University	Oregon	(503) 678-1264	bob.mcreynolds@oregonstate.edu
bean, succulent	Myers	Rebecca	JR Simplot	Washington	(509) 787-4521	rebecca.myers@simplot.com
pea, succulent	Myers	Rebecca	JR Simplot	Washington	(509) 787-4521	rebecca.myers@simplot.com
bean, succulent	Nelson	Stan	Twin City Foods	Washington	(360) 629-2111	stann@twincityfoods.com
pea, succulent	Nelson	Stan	Twin City Foods	Washington	(360) 629-2111	stann@twincityfoods.com
pea, succulent	Ovenell	Jeff	Wilbur-Ellis	Washington	(360) 466-3138	jovenell@wecon.com
bean, succulent	Piercy	Lloyd	Golden Canyon Ranch	Oregon	(541) 567-1506	lpiercy@oregontrail.net
pea, succulent	Piercy	Lloyd	Golden Canyon Ranch	Oregon	(541) 567-1506	lpiercy@oregontrail.net
general project information	Stark	John	Washington State University	Washington	(253) 445-4519	stark@puyallup.wsu.edu
pea, succulent	Stubbs	Gene	Chiquita Food Processing Plant	(both	(509) 525-8390	gstubbs@senecafoods.com
general project information	Walsh	Doug	Washington State University	Washington	(509) 786-6927	dwalsh@wsu.edu
pea, succulent	Walsh	Doug	Washington State University	Washington	(509) 786-6927	dwalsh@wsu.edu
n/a - Western Region IPM Center State Liaisons/Representatives	Blodgett	Sue	Montana State University	Montana	(406) 994-2402	blodgett@montana.edu
	Daniels	Catherine	Washington State University	Washington	(509) 372-7495	cdaniels@tricity.wsu.edu
	Deer	Howard	Utah State University	Utah	(435) 797-1602	howardd@ext.usu.edu
	Hirnyck	Ronda	University of Idaho	Idaho	(208) 364-4046	rhirnyck@uidaho.edu
	Jahns	Tom	University of Alaska Fairbanks	Alaska	(907) 262-5824	fftrj@uaf.edu
	Jenkins	Jeff	Oregon State University	Oregon	(541) 737-5993	jenkinsj@ace.orst.edu

SNAP PEAS: *Pisum sativum*

Western flower thrips (WFT); *Frankliniella occidentalis* (Pergande)

Douglas Walsh, Molly Olmstead, and Ron Wight

Irrigated Agricultural Research Extension Center

Washington State University
24106 N. Bunn Rd.
Prosser, WA 99350-9687
Phone (509) 786-9287
Fax (916) 752-1537
Email: dwalsh@tricity.wsu.edu

INSECTICIDE EFFICACY AND EFFECTS ON WESTERN FLOWER THRIPS IN WASHINGTON STATE SNAP PEAS, 1999: Efficacy of Success® as a potential reduced-risk treatment to dimethoate was field tested on snap peas in Washington State. The experimental site was a commercial field in Yakima County, WA. Plot design consisted of 4 replicates of 266 ft^2 at an equivalent of 40 gallons per acre. All insecticides were applied following early bloom on 30 June. Following label instructions, a second "bump" application was made 7 days later. Arthropod populations were calculated by shake sampling prior to insecticide application and 4, 10, and 14 days following the initial insecticide application. Three additional sampling methods were used to estimate Western flower thrips populations per blossom. These methods included: (1) shaking 10 blossoms in a vial containing 2 fluid oz of alcohol, (2) shaking 10 blossoms in a vial containing 2 fluid oz of water, and (3) putting 25 blossoms per replicate in a Berlese funnel. Plots were harvested 14 days following the second insecticide application date and feeding damage assessments on 100 seedpods per replicate were made. Fruit damage was determined by visual rating, which consisted of three independent examinations using predetermined criteria. A percent damage assessment was calculated according to type of pest.

Mean thrips population abundance per flower pre-treatment, 4, 10 and 14 days post-treatment was determined. All of the insecticides tested in this trial reduced estimated Western flower thrips populations compared to the untreated check 14 days after the initial insecticide application. At tested concentrations, Success® reduced observable feeding damage from flower thrips, but had no effect on Lygus bug feeding damage. Lygus bug feeding damage was substantial in all of the plots, indicating low efficacy of insecticides against Lygus bug.

Treatment/ Formulation	Rate (AI/acre)	DAT	Mean No. Thrips/flower ± SE			
			Beat	A per flower	W per flower	Berlese
Untreated check		0	15.500	1.950	1.550	1.110
Success Naturalyte	4 oz.	0	19.250	1.325	1.000	1.230
Success Naturalyte	6 oz.	0	14.500	1.375	1.175	1.260
Success Naturalyte	8 oz.	0	21.250	1.750	1.150	0.960
Agri-Mek 0.15 EC	16 oz.	0	17.750	1.675	1.175	1.560
Dimethoate 4001/		0	18.500	0.950	0.625	0.750
Dimethoate 400	0.5 lb.	0	24.500	1.950	1.050	1.250
Untreated check		4	15.000	1.325	0.950	1.190
Success Naturalyte	4 oz.	4	8.250[a]	0.875	0.300	0.630
Success Naturalyte	6 oz.	4	6.000[a]	0.675[a]	0.325	0.440
Success Naturalyte	8 oz.	4	7.500[a]	0.875	0.350	0.570
Agri-Mek 0.15 EC	16 oz.	4	7.250[a]	0.950	0.300	0.780
Dimethoate 400[1/]		4	1.750[b]	0.150[b]	0.200	0.220
Dimethoate 400	0.5 lb.	4	6.750[a]	0.775[a]	0.400	0.670
Untreated check		10	18.750	1.400	1.475	1.690
Success Naturalyte	4 oz.	10	10.000[a]	1.250	0 .450	0.960
Success Naturalyte	6 oz.	10	8.250 [a]	0.850	0.450	0 .730
Success Naturalyte	8 oz.	10	5.250 [a]	0.900	0.475	0.710
Agri-Mek 0.15 EC	16 oz.	10	10.000 [a]	0.850	0.925	1.240
Dimethoate 400[1/]		10	1.500 [b]	0.325 [a]	0.200	0.520
Dimethoate 400	0.5 lb.	10	7.750 [a]	0.950	0.550	1.300
Untreated check		14	10.000	1.025	0.625	1.460
Success Naturalyte	4 oz.	14	10.000	1.275	0.450	0.920
Success Naturalyte	6 oz.	14	8.250	0.850	0.450	0.930
Success Naturalyte	8 oz.	14	5.250	1.000	0.475	1.000
Agri-Mek 0.15 EC	16 oz.	14	10.000	0.850	0.925[z]	1.480
Dimethoate 400	0.5 lb.	14	7.750	0.950	0.550	1.460

[a] Thrips population means are significantly lower than the untreated control by Fisher's PLSD < 0.05.
[b] Thrips population means are significant less than the untreated control by Fisher's PLSD < 0.01.
[z/] Thrips population means are significantly greater than the untreated control by Fisher's PLSD > 0.05.
[2/] Application applied by a professional aerial applicator.

Treatment/ Formulation	Rate (AI/acre)	DAT	Mean Thrips Damage
Untreated check		14	45.500
Success Naturalyte	4 oz.	14	4.250 [b]
Success Naturalyte	6 oz.	14	17.750 [b]
Success Naturalyte	8 oz.	14	12.250 [b]
Agri-Mek	16 oz.	14	15.000 [b]
Dimethoate 400	0.375 lb.	14	19.500 [b]

[b] Thrips damage means are significantly lower than the untreated check by Fisher's PLSD < 0.01.

1999 Final Report

PROJECT NO: 13K-3743-4918

TITLE: Evaluation of New Insecticides for Pea Aphid Control and Determination of Their Impact on Aphid Predators and Parasites

PERSONNEL: John D. Stark, Assistant Entomologist,
Washington State University-Puyallup, WA

REPORTING PERIOD:
This report is for the period of July 1, 1999 – October 15, 1999

ACCOMPLISHMENTS:

We applied pesticides on August 9th, 1999 to pea plantings in Puyallup. Peas were sprayed at full bloom with a CO2 powered back-pack sprayer. The silicone surfactant, Sylgard 309, was added to all treatments at a rate of 0.02%. Aphid counts were taken on August 16th, 1999

Pesticides applied:

Pirimor (8 oz product per acre)	Fullfill (0.086 lbs ai/acre)
Provado (50 g ai /acre)	Aphistar (0.125 lbs ai/acre)
Warrior (0.03 lbs ai/acre)	Actara (0.0223 lbs ai/acre)
Capture (0.075 lb ai/acre)	Dimethoate (1 pint/acre)
Acetamiprid (0.5 lbs ai/acre)	
Control – (water and surfactant only)	

Results

Treatment	No. of Aphids/plant Mean + SD
Control	3022 ± 516
Fullfill	14 ± 9
Provado	9 ± 5
Aphistar	0 ± 0
Pirimor	0 ± 0
Warrior	1 ± 1
Capture	0 ± 0
Actara	150 ± 207
Dimethoate	126 ± 145
acetamiprid	14 ± 11

Aphistar, Pirimor, Warrior and Capture all provided excellent control. Provado, Fulfill and acetamiprid provided high levels of control but not as high as the products previously mentioned. Higher rates should be evaluated for Provado, Fulfill and acetamiprid.

ARE PROCESSED GREEN PEAS IN THE BLUE MOUNTAIN REGION OF NORTHEASTERN OREGON AND SOUTHEASTERN WASHINGTON ECONOMICALLY SUSTAINABLE?

Tom Darnell
Oregon State University Extension Agent
Thomas.Darnell@orst.edu

Processed (canned and frozen) green peas have been grown, in rotation with winter wheat, in the Blue Mountain region since the 1930's. In higher rainfall areas, where growers can annually crop, green peas have provided additional income, aided in weed control and reduced soil erosion. Hundreds of seasonal jobs were created to plant, harvest, transport and process the crop.

During the boom years over 80,000 acres of peas where processed in plants from Pendleton, Oregon to Dayton, Washington. However, in recent years the acreage has remained stable at 35,000 to 40,000 acres grown for freezing and 3,000-5,000 acres for canning. The majority of this acreage has been processed in Weston, Oregon and Walla Walla, Washington. A major freezing plant in Walla Walla, that normally processed 16-18,000 acres of peas, closed after the 2000 season.

The short crop rotation has contributed to the buildup of several soil-borne fungal diseases that reduces yield and quality. Virus diseases spread by the green pea aphid can occasionally be serious, especially after mild winters. During the growing season lack of timely rains and high temperatures during bloom and berry maturation, also reduce yield and quality. Yields vary from 500 to over 6,000 pounds per acre. The area's long-term yield is 1.25 to 1.50 tons/acre. Yields are usually lower at the beginning and end of the growing season.

Growers' production costs have steadily increased while the price received for the crop has decreased. For example, in 1995 seed cost growers $0.19/pound. In 2001 seed rose to $0.27/pound, increasing seed cost by $16.00/acre. At what point will the crop no longer be economically sustainable?

There are numerous definitions for sustainable agriculture. As defined by the US Congress* sustainable agriculture is "an integrated system of plant and animal production practices having a site-specific application that will, over the long term:

1. satisfy human food and fiber needs;
2. enhance environmental quality and the natural resource base upon which the agricultural economy depends;
3. makes the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls;
4. sustain the economic viability of farm operations; and
5. enhance the quality of life for farmers and society as a whole."

"In summary sustainable agriculture is.
1. Economically viable-if it is not profitable, it is not sustainable;
2. Socially supportive-the quality of life of farmers, farm families and farm communities is important;
3. Ecologically sound-we must preserve the resource base that sustains us all. " *(http://wsare.usu.edu/docs/sustag.htm)

Data from the Oregon Agricultural Statistics Service, Oregon Agri-Facts, Vol. 20-01 (summarized) is useful in helping determine if Oregon's farming, in general, is economically sustainable.

YEAR	1996	1997	1998	1999	2000
NET INCOME/FARM * *	$15,062	$15,977	$12,380	$7,909	$8,438
RATE OF RETURN FROM CURRENT INCOME-PERCENT***	3.44	3.62	2.74	1.75	1.81

**Farm is any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold during the year.

***Returns to operators from net farm income divided by total assets (operator's capital investment).

Washington State University's Farm Management Report, EB 1313 1999 *Winter Wheat and Green Pea Enterprise Budgets for Walla Walla County, Washington provides* useful data regarding the economic viability of green peas in rotation with winter wheat on a 2,000 acre ranch with 500 acres of dryland green peas each year. The Report assumes a green pea yield of 1.3 tons/acre and a price of $195.00/ton. The total green pea production cost/acre in the Report is $254.40. For the purpose of this discussion, the assumed break-even production cost for green peas is $254.40/acre. Individual growers may have lower or higher break-even costs.

The price/ton paid to growers decreases as the tenderometer (maturity) reading increases. Increases in yield, due to harvesting more mature peas, may or may not offset the lower price per ton paid by the processors. Actual data from two growers in the region, (X and Y), is shown on page 3. The decrease in price received by grower X reflects a reduction in the price/ton received from the processor and the peas being harvested at a higher tenderometer.

Grower X

YEAR	$/TON RECEIVED (All Fields)	YIELD NEEDED TO GROSS $254.40 (BREAK EVEN)
1997	$204	1.24
1998	218	1.17
1999	155	1.64
2000	141	1.80
2001	113	2.25

GROWER Y-Crop year 2001

YIELD	$/TON RECEIVED	ACTUAL YIELD TONS/ACRE	YIELD NEEDED TO GROSS $254.40 (BREAK EVEN)
Field A	$117	1.5	2.17
Field B	119	2.1	2.13
Field C	115	1.8	2.21
Field D	200	1.4	1.27
Field E	180	1.5	1.41

Based on these examples green pea production in the region is not economically sustainable. This is re-enforced by growers making major changes in their operations to increase their efficiencies and economies of scale. Pea growers are also searching for alternative crops to replace green peas. Growers and processors are impacted by many of the same factors that threaten the entire Pacific Northwest's food processing industry. There are no easy solutions to improving the economic viability of the industry but the industry must be united in producing quality products that are profitable for all concerned.