

“Final Project Report to the NYS IPM Program, Agricultural IPM 2002-2003”

1. IPM Implementation Project - New Using NEWA Internet Resources To Increase Use of Onion IPM

2. Project Leaders:

Carol R. MacNeil, CCE, Vegetable Extension Program in Ontario, Wayne, Yates and Steuben Cos., and

John P. Gibbons, CCE, Vegetable Extension Program in Ontario, Wayne, Yates and Steuben Cos., and NEWA, NYS IPM Program

3. Grower Cooperators:

Ken Datthyn, Sodus

Kevin Datthyn, Sodus

Jack and Mark Johnson, Sodus

Lucian Sacheli, Potter

Greg and Jeff Squires, Prattsburg

4. Training practitioners to use IPM techniques

5. Wayne, Yates and Steuben Counties

6. Abstract:

Growers on 5 onion farms were taught how to access information from NEWA and 4 were assisted in incorporating NEWA disease and weather forecasts, as well as field scouting, into their crop protection decision-making process. This helped them fine-tune their pesticide applications and to reduce the risks of crop loss from pests. It is expected that they would make more use of NEWA in a year with normal/excess rainfall. Two of the 4 growers never participated in an onion IPM program before.

7. Background and Justification:

Implementation of IPM techniques in onions has continued to be a high priority for the Vegetable IPM Program. Years of research and implementation projects and personal observations have confirmed the validity of these techniques. Most onion growers, over the past 10 – 15 years, have increased their scouting efforts and adjusted spray intervals and choice of materials to some extent based on past IPM projects, winter meeting presentations and information in extension publications like Vegetable Notes and the Weekly Vegetable Update. Use of disease forecasting programs like Cornell’s Blight Alert, the Michigan Botrytis and Alternaria forecasts, and the Canadian downy mildew forecast have been limited, however. This has largely been due to the difficulty of getting local weather station information and disease forecasts into the hands of growers several times per week. Internet adoption had been slow in the local vegetable industry. A few local growers have received the information available on NEWA faxes but their impact had not been great probably because they needed more assistance with interpretation. One grower subscribed to and used NEWA and the Cornell Guidelines on-line in 2001 and there was a significant impact on him and his pesticide spray program. He was very impressed with all the information he could access and with how useful it was to him. He reduced fungicide rates based

on the forecasts in that dry year, did a better job choosing materials, and increased his confidence in his crop protection program. Having weekly scouting reports along with the NEWA disease forecasts was essential for him to see what the forecasts could do. Computer and Internet use is finally becoming more common among local growers and many are excited about exploring on-line resources. The time was right to demonstrate NEWA and other IPM resources on-line to these growers.

8. Objectives:

- 1) Familiarize growers with IPM Internet resources.
- 2) Relate NEWA disease and weather forecasts to pest pressure in the field.
- 3) Help growers fine-tune their pesticide spray programs based on the information from NEWA, in addition to currently used resources.
- 4) Demonstrate NEWA and other IPM resources on-line at grower meetings.
- 5) Evaluate how the project has changed grower pest management practices.

9. Procedures:

- 1) Individual consultations were conducted with the growers on their farms and with their computers to familiarize them with NEWA resources (weather data, pest forecasts, weather forecasts) and the Cornell Guidelines on-line (including IPM links, pest fact sheets, pesticide labels, etc. as well as the information also available in the hard copy). Five growers with about 465 acres of onions were trained. One subsequently lost his crop due to wind and freezing, and dropped out.
- 2) One to two fields of each of 4 farms were scouted weekly for diseases and insects and growers received a scouting report form with their pest levels. This information was related, during individual consultations and on the report, to the disease and onion maggot forecasts and the weather information from NEWA, so they could learn how to use this new source of information and to trust its validity.
- 3) Recommendations on timing of pesticide applications, choice of materials, and rates were given based on established IPM procedures and Cornell research. The scouting reports and NEWA forecasts were used in making the recommendations and growers were given explanations on how this was done. Growers generally used the same practices on all of their fields.
- 4) Demonstrations of NEWA disease and weather forecasts and other IPM resources on-line (Cornell Guidelines, IPM fact sheets, other IPM links, etc.) were conducted, with a cooperating grower taking the lead, at an Internet Training Meeting on March 6th in Canandaigua and at the NYS Onion Industry Council meeting on July 11th in Oswego Co. About 25 growers attended in total. Information on NEWA and how it could be used was included in Vegetable Notes and the Weekly Vegetable Update.
- 5) Spray records were collected and related to the scouting reports and to the pest and weather forecasts on NEWA. Growers were asked how their pesticide application choices compared to

those of previous years. They were also asked how NEWA and other Cornell pest management resources could be improved.

10. Results and discussion:

The 5 growers were already on-line but 3 hadn't used the Internet much until we visited them. They were all impressed with what was available through the NEWA website. They were "walked through" all the information available, especially that relating to onion diseases, which is quite extensive. A few seemed somewhat overwhelmed by it all. We asked whether they had questions during the season and answered them. There are many growers in the region who still don't use the Internet much. For one of the growers this is the second year of using the Internet and NEWA and he's becoming more comfortable with it but still has plenty of questions regarding interpreting the information. It's clear that growers need lots of practice studying the disease and weather forecasts available on NEWA and relating them to the field situation. This will take time. All the growers logged on at least once or twice a week during the season to check on the disease and weather forecasts. They said that they would have used NEWA more if it hadn't been such a dry year. It's a big step for growers to make the time to stay indoors during the growing season to get on the Internet. These are growers who do field work themselves.

Fields were scouted weekly from early June through mid-August and growers received a written report form. It usually included references to the current disease, insect and weather forecasts on NEWA. Recommendations on whether a spray was needed and what material to use were often made. The scouting was the most popular part of the program, especially when the scout was able to talk face to face with the growers. They all studied the scouting report forms each week. Interpretation of the onion disease forecasts on NEWA was needed during the season and they asked questions. For example: "Is an IPI of 8 or 9 reason to increase Bravo rates?" Integrating the weather forecast with the disease forecast and scouting information to come up with a crop protection strategy also takes some practice. We don't always call it right and we've been doing it since the 1980s! There was concern in mid-June, when onions were still small due to late planting and cold weather. Botrytis levels jumped from very low levels to 2 – 3 lesions/leaf in two fields in the Sodus area in a very short time. It was felt by one grower that the Botrytis Blight Alert "forecast" system didn't work because the IPIs had been low (though the MI Botrytis forecast indicated high risk). Growers were advised to apply fungicides and were reassured that the counts weren't of serious concern since the lesions were on the oldest leaf, which would fall off soon. This has been a problem before. Do we recommend a fungicide when the lesion count is still very low if rain is forecast sometime during the next week? Is it safe to wait until 1+ lesion/leaf is actually reached even though the count may jump from 0.4 to 2 in a week? Scouting just once a week makes it imperative that the grower be watching weather forecasts carefully and make the call regardless of how things looked the day the scout was there. None of the growers used Blight Alert as it was designed, waiting day by day for the proper conditions, and didn't think that they would in the future because of spray scheduling concerns and the need to control several other onion diseases. Adding to Botrytis leaf blight the concern about downy mildew, Alternaria purple blotch, black mold, and bacterial diseases makes the decision on when and what fungicide to apply very complex. There is the tendency for growers to take the conservative approach, that is, they tend to increase rates if any of the following occur: forecast of rain; increasing disease levels, even if still low; conditions favorable for disease in any of the forecast programs, etc. It will take a few years before growers can effectively make use of all the resources available. Also, without experienced field scouting, the full potential of the onion IPM program will not be realized.

The educational meetings that were held were useful in increasing awareness of NEWA pest and weather forecast information and of how a local grower was finding it of benefit. The cooperating growers, however, need more experience integrating all the resources (field scouting, information from meetings and newsletters, research updates, NEWA pest and weather forecasts, etc.) to improve their skills in using all this information and to make a more convincing case for why other growers should add NEWA resources to their pest management toolbox. Many growers are still not comfortable with using the Internet and of those who are, many aren't inclined to use it when they could be out doing field work. Education in this area needs to continue so growers become comfortable, quicker and more proficient. Having NEWA free for another year would encourage growers to experiment with this new technology and what it can do for them. Information on weather forecasts and onion disease forecasting through NEWA were included in the Weekly Vegetable Update and growers were invited to call with their questions.

The growers reported cutting fungicide rates more than they otherwise would have based on scouting and NEWA information when disease pressure was down, but did not generally cut the number of applications. Some stretched sprays during the middle of the driest period. Comparing NEWA records, Botrytis levels and their spray records most growers did alter Bravo rates based on the IPI or pest levels in many cases. Growers also said that they had the information needed to better choose what fungicide materials to use. Wayne Co. has traditionally used higher Bravo rates and low maneb/mancozeb rates and has had problems controlling downy mildew and Alternaria purple blotch the past few years. They have increased maneb/mancozeb rates and decreased Bravo rates to some extent, and appear to be basing them on forecast/scouting information. Some Yates Co. growers have used very low rates of Bravo and moderate rates of maneb/mancozeb and have occasionally had trouble with Botrytis leaf blight. More adjustment of Bravo rate based on conditions appears to be occurring. Grower 4 has cooperated the longest on onion IPM, including both scouting and NEWA, and his spray schedule reflects our recommendations the best. There needs to be reinforcement about using Quadris in a way that will not increase the risk of disease resistance. One grower used half rates in each of three sequential sprays for Alternaria control. Grower 1 reported completely cutting out early, unnecessary insecticide applications. Growers seemed most responsive to the information available if they actually saw the scout each week and additional time/mileage needs to be allocated in the future so this can be accomplished.

The growers and we had several suggestions. First, they felt that an experienced scout was essential and his expertise was much appreciated. The growers do some of their own scouting but the amount of time they spend on this and their skills vary. Personally talking to the scout or the agent about the need for a spray, the choice of material and the rate needs to happen every week. They need more practice integrating all the information available and help doing so. This process is quite complex and initially time-consuming and they need significant help with it. The latest research information also needs to be integrated into this system.

The growers feel that the scouting form needs to be simplified and clarified. It was suggested that the sequential sampling charts for thrips and Botrytis not be on the grower form and that the data collection part be titled "For Scout Use." This would leave more room for maps and comments. The "Weed" section and "Pest/Weed Map" could be moved to the middle. This would leave room for a "Comments" section to the right of each of the major pests listed at the top.

Regarding the "Botrytis" section, since 1 lesion/leaf is only the threshold for the first spray, what number of lesions/leaf would be of concern later in the season? Drop "Spray required – yes or no?" Change the bottom left of the Botrytis section to "Recent IPIs = X to X" and the threshold

to “IPI = 7 plus 30% chance of rain.” Comments regarding the weather forecast and what disease it favors could be on the right. The MI Alternaria forecast (NEWA onion disease forecast - attached) almost always indicates high pressure, which seems to indicate the need for high maneb/mancozeb rates most of the time. This needs to be adjusted for NYS conditions or only displayed after the disease has been observed. A grower suggested integrating the weather forecast into the disease “forecast”, using forecasted weather for the next week in the Blight, etc. programs. We agree since guessing what’s going to happen is not accurate enough.

In the “Thrips” section, leave off #/plant because it’s confusing and since #/leaf is the important number, related to the threshold of 3/leaf. Take off “Cutworms” and add “Other Pests/Comments” below the major pests instead. I would reduce the emphasis on the onion maggot section. Leave off “degree days” and “Generation”. Indicate “Peak flight based on degree days, yes or no.” Leave in “Spray at peak if 1st brood damage is greater than 5%”.

Duplicate forms are essential and need to be included in future budgets.

In addition to working on integrating NEWA forecasts with other onion disease information we were also scouting for thrips and working with Tony Shelton, Brian Nault and Jason Plate on thrips management and insecticide resistance. Having insecticide spray records from these 4 growers’ farms (attached) plus 2 other local farms (Warrior only – for thrips; Ambush three times beginning in mid-June, then switching to Lannate because of poor thrips control) points out the problem with thrips control in onions today. Many onion growers persist in applying pyrethroids for second brood onion maggot flies in spite of efforts to discourage this practice unless first brood damage was high. They also apply pyrethroids late in the season trying to knock down onion maggot flies. Thrips were present in many onion fields during these times and exposing them to insecticides so frequently is probably contributing to the development of resistance. These applications are in addition to applying Warrior in an attempt to control thrips. There is a tremendous reluctance to give up on Warrior for thrips control, in spite of evidence that it doesn’t always work, because it is so cheap compared with the alternatives. Sometimes Warrior works! Thrips pressure varied a lot from farm to farm and grower use of insecticides also varied a lot. The two were not necessarily related. Widespread assessment of insecticide susceptibility/resistance, the availability of a choice of effective materials, and a better understanding of onion maggot fly behavior should help growers limit the number of insecticide sprays.

11. Samples of materials attached:

Charts with pest levels, thresholds, spray applications and spray records from the 4 growers
NEWA onion disease tables for the Potter and Sodus stations and June weather summary for
Sodus station in 2002

NEWAoniondiseasedata2002

Potter Modified Blight Alert

Planting date	4/3	4/13	4/23	5/3
8/23/2002	11.55	11.55	11.55	11.55
8/22/2002	3.15	3.15	3.15	3.15
8/21/2002	4.25	4.25	4.25	4.25
8/20/2002	12.81	12.81	12.81	12.81
8/19/2002	6.73	6.73	6.73	6.73
8/18/2002	15.40	15.40	15.40	15.40
8/17/2002	4.47	4.47	4.47	4.47
8/16/2002	16.28	16.28	16.28	16.28
8/15/2002	6.37	6.37	6.37	6.37
8/14/2002	10.56	10.56	10.56	10.56
8/13/2002	10.56	10.56	10.56	10.56
8/12/2002	8.85	8.85	8.85	8.85
8/11/2002	8.99	8.99	8.99	8.99
8/10/2002	8.85	8.85	8.85	8.85
8/9/2002	9.85	9.85	9.85	9.85
8/8/2002	9.10	9.10	9.10	9.10
8/7/2002	5.90	5.90	5.90	5.90
8/6/2002	2.85	2.85	2.85	2.85
8/5/2002	7.50	7.50	7.50	7.50
8/4/2002	10.68	10.68	10.68	10.68
8/3/2002	9.56	9.56	9.56	9.56
8/2/2002	10.29	10.29	10.29	10.29
8/1/2002	10.57	10.57	10.57	10.57
7/31/2002	9.67	9.67	9.67	9.67
7/30/2002	10.23	10.23	10.23	10.23
7/29/2002	13.42	13.42	13.42	13.42
7/28/2002	12.52	12.52	12.52	12.52
7/27/2002	8.92	8.92	8.92	8.92
7/26/2002	7.45	7.45	7.45	7.45
7/25/2002	10.30	10.30	10.30	10.30
7/24/2002	16.54	16.54	16.54	16.54
7/23/2002	11.33	11.33	11.33	11.33
7/22/2002	4.42	4.42	4.42	4.42
7/21/2002	8.95	8.95	8.95	8.86
7/20/2002	12.36	12.36	12.36	12.22
7/19/2002	11.57	11.57	11.57	11.42
7/18/2002	2.15	2.15	2.15	2.11
7/17/2002	6.65	6.65	6.65	6.51
7/16/2002	4.99	4.99	4.99	4.87
7/15/2002	8.94	8.94	8.94	8.66
7/14/2002	8.20	8.20	8.20	7.89
7/13/2002	8.83	8.83	8.83	8.43
7/12/2002	8.11	8.11	8.11	7.66
7/11/2002	7.47	7.47	7.39	6.99
7/10/2002	14.13	14.13	13.97	13.07
7/9/2002	8.14	8.14	8.03	7.44
7/8/2002	9.82	9.82	9.66	8.85
7/7/2002	5.37	5.37	5.26	4.77
7/6/2002	8.91	8.91	8.68	7.78
7/5/2002	4.73	4.73	4.58	4.06
7/3/2002	5.19	5.19	4.95	4.28
7/2/2002	6.46	6.46	6.11	5.21

7/1/2002	11.54	11.42	10.80	9.09
6/30/2002	11.57	11.44	10.71	8.88
6/29/2002	12.24	12.07	11.18	9.14
6/28/2002	15.44	15.19	13.92	11.19
6/27/2002	13.48	13.20	11.97	9.46
6/26/2002	11.53	11.24	10.07	7.82
6/25/2002	11.49	11.13	9.86	7.51
6/24/2002	5.78	5.55	4.86	3.62
6/23/2002	13.48	12.86	11.12	8.10
6/22/2002	7.78	7.36	6.28	4.46
6/21/2002	10.57	10.00	8.41	5.82
6/20/2002	10.08	9.43	7.82	5.25
6/19/2002	9.58	8.87	7.25	4.71
6/18/2002	10.92	10.00	8.04	5.04
6/17/2002	8.31	7.53	5.95	3.57
6/16/2002	16.15	14.47	11.23	6.43
6/15/2002	20.79	18.42	14.02	7.60
6/14/2002	14.43	12.63	9.42	4.78
6/13/2002	17.68	15.28	11.14	5.24
6/12/2002	0.83	0.71	0.50	0.22
6/11/2002	9.94	8.37	5.79	2.21

Potter 2002

Date	Alternaria	MI	Botrytis*	D. Mildew
8/21/2002	5.0 H.Risk	10	IIP	Unfavorable
8/20/2002	6.3 H.Risk	37	IIP	Unfavorable
8/19/2002	6.3 H.Risk	2	IIP	Unfavorable
8/18/2002	6.3 H.Risk	45	IIP	Unfavorable
8/17/2002	6.3 H.Risk	2	IIP	Unfavorable
8/16/2002	7.0 H.Risk	2	IIP	Favorable
8/15/2002	7.0 H.Risk	2	IIP	Unfavorable
8/14/2002	6.7 H.Risk	1	IIP	Unfavorable
8/13/2002	6.3 H.Risk	1	IIP	Unfavorable
8/12/2002	6.0 H.Risk	0	IIP	Unfavorable
8/11/2002	6.0 H.Risk	0	IIP	Unfavorable
8/10/2002	6.0 H.Risk	1	IIP	Unfavorable
8/9/2002	5.7 H.Risk	15	IIP	Favorable
8/8/2002	5.3 H.Risk	5	IIP	Favorable
8/7/2002	5.3 H.Risk	0	IIP	Unfavorable
8/6/2002	5.7 H.Risk	1	IIP	Unfavorable
8/5/2002	6.3 H.Risk	2	IIP	Unfavorable
8/4/2002	6.7 H.Risk	2	IIP	Unfavorable
8/3/2002	7.0 H.Risk	2	IIP	Unfavorable
8/2/2002	6.7 H.Risk	2	IIP	Unfavorable
8/1/2002	6.7 H.Risk	5	IIP	Unfavorable
7/31/2002	6.0 H.Risk	35	IIP	Unfavorable
7/30/2002	6.3 H.Risk	58	SIP	Unfavorable
7/29/2002	6.3 H.Risk	80	SIP	Unfavorable
7/28/2002	4.3 L.Risk	71	SIP	Unfavorable
7/27/2002	4.3 L.Risk	74	SIP	Favorable
7/26/2002	5.7 H.Risk	84	SIP	Unfavorable
7/25/2002	6.3 H.Risk	76	SIP	Favorable
7/24/2002	6.0 H.Risk	14	IIP	Favorable
7/23/2002	4.0 L.Risk	1	IIP	Unfavorable
7/22/2002	6.0 H.Risk	1	IIP	Unfavorable
7/21/2002	6.7 H.Risk	49	IIP	Unfavorable
7/20/2002	6.3 H.Risk	6	IIP	Unfavorable

7/19/2002	5.0	H.Risk	1	IIP	Unfavorable
7/18/2002	5.0	H.Risk	1	IIP	Unfavorable
7/17/2002	5.7	H.Risk	0	IIP	Unfavorable
7/16/2002	5.7	H.Risk	0	IIP	Unfavorable
7/15/2002	6.3	H.Risk	0	IIP	Unfavorable
7/14/2002	5.3	H.Risk	0	IIP	Unfavorable
7/13/2002	5.3	H.Risk	0	IIP	Favorable
7/12/2002	5.3	H.Risk	32	IIP	Unfavorable
7/11/2002	5.3	H.Risk	10	IIP	Favorable
7/10/2002	6.0	H.Risk	9	IIP	Unfavorable
7/9/2002	5.3	H.Risk	0	IIP	Unfavorable
7/8/2002			0	IIP	
7/7/2002			3	IIP	
7/6/2002			3	IIP	
7/5/2002			2	IIP	
7/3/2002	N/A		2	IIP	Unfavorable
7/2/2002	6.7	H.Risk	1	IIP	Unfavorable
7/1/2002	6.7	H.Risk	9	IIP	Unfavorable
6/30/2002	6.7	H.Risk	56	SIP	Unfavorable
6/29/2002	6.7	H.Risk	80	SIP	Favorable
6/28/2002	6.0	H.Risk	55	SIP	Unfavorable
6/27/2002	7.0	H.Risk	52	SIP	Unfavorable
6/26/2002	6.7	H.Risk	6	IIP	Unfavorable
6/25/2002	6.7	H.Risk	41	IIP	Favorable
6/24/2002	6.7	H.Risk	2	IIP	Unfavorable
6/23/2002	7.0	H.Risk	1	IIP	Unfavorable
6/22/2002	6.7	H.Risk	0	IIP	Unfavorable
6/21/2002	6.3	H.Risk	2	IIP	Unfavorable
6/20/2002	6.0	H.Risk	32	IIP	Favorable
6/19/2002	6.0	H.Risk	79	SIP	Favorable
6/18/2002	6.0	H.Risk	90	SIP	Favorable
6/17/2002	6.3	H.Risk	96	SIP	Favorable
6/16/2002	5.7	H.Risk	97	SIP	Unfavorable
6/15/2002	5.0	H.Risk	97	SIP	Unfavorable
6/14/2002	4.3	L.Risk	56	SIP	Unfavorable
6/13/2002	4.0	L.Risk	14	IIP	Favorable
6/12/2002	5.7	H.Risk	0	IIP	Unfavorable
6/11/2002	6.0	H.Risk	4	IIP	Favorable

Sodus 2002

Original Blight Alert

Date	4/3	4/13	4/23	5/3	Planting date
8/26/2002	11.85	11.85	11.85	11.85	
8/25/2002	22.84	22.84	22.84	22.84	
8/24/2002	4.71	4.71	4.71	4.71	
8/23/2002	9.81	9.81	9.81	9.81	
8/22/2002	6.00	6.00	6.00	6.00	
8/21/2002	8.82	8.82	8.82	8.82	
8/20/2002	4.71	4.71	4.71	4.71	
8/19/2002	6.67	6.67	6.67	6.67	
8/18/2002	16.57	16.57	16.57	16.40	
8/17/2002	13.45	13.45	13.45	13.30	
8/16/2002	14.49	14.49	14.49	14.29	
8/15/2002	1.88	1.88	1.88	1.85	
8/14/2002	2.07	2.07	2.07	2.03	
8/13/2002	1.55	1.55	1.55	1.51	
8/12/2002	6.45	6.45	6.45	6.25	
8/11/2002	8.20	8.20	8.20	7.89	
8/10/2002	7.40	7.40	7.40	7.06	
8/9/2002	7.28	7.28	7.28	6.88	
8/8/2002	4.78	4.78	4.73	4.47	
8/7/2002	3.18	3.18	3.14	2.94	
8/6/2002	2.84	2.84	2.80	2.59	
8/5/2002	7.12	7.12	7.00	6.41	
8/4/2002	9.00	9.00	8.81	7.99	
8/3/2002	6.22	6.22	6.06	5.43	
8/2/2002	4.35	4.35	4.21	3.73	
8/1/2002	8.70	8.70	8.36	7.32	
7/31/2002	9.72	9.72	9.27	8.02	
7/30/2002	12.36	12.36	11.68	9.97	
7/29/2002	18.82	18.63	17.61	14.82	
7/28/2002	9.75	9.64	9.02	7.49	
7/27/2002	4.72	4.66	4.31	3.52	
7/26/2002	3.93	3.87	3.54	2.85	
7/25/2002	8.48	8.30	7.52	5.95	
7/24/2002	8.19	7.98	7.15	5.55	
7/23/2002	15.53	15.05	13.33	10.15	
7/22/2002	6.29	6.05	5.30	3.95	
7/21/2002	8.92	8.51	7.35	5.36	
7/20/2002	13.30	12.57	10.72	7.62	
7/19/2002	8.08	7.64	6.43	4.45	
7/18/2002	1.80	1.69	1.40	0.94	
7/17/2002	3.85	3.57	2.92	1.90	
7/16/2002	4.29	3.93	3.16	1.98	
7/15/2002	3.66	3.32	2.62	1.58	
7/14/2002	7.27	6.51	5.05	2.89	
7/13/2002	7.80	6.91	5.26	2.85	
7/12/2002	7.35	6.43	4.79	2.44	
7/11/2002	5.65	4.88	3.56	1.67	
7/10/2002	15.06	12.85	9.13	3.92	
7/9/2002	1.61	1.35	0.93	0.36	
7/8/2002	2.95	2.45	1.65	0.54	
7/7/2002	4.35	3.55	2.31	0.61	
7/6/2002	6.04	4.86	3.04	0.59	
7/5/2002	1.57	1.24	0.75	0.08	
7/4/2002	0.41	0.32	0.18	0.00	

7/3/2002	1.13	0.86	0.47	-0.05
7/2/2002	0.86	0.64	0.33	-0.09
7/1/2002	5.91	4.31	2.03	-0.93
6/30/2002	6.61	4.70	2.01	-1.44
6/29/2002	7.07	4.89	1.87	-2.01
6/28/2002	12.49	8.39	2.75	-4.42
6/27/2002	10.07	6.54	1.74	-4.33
6/26/2002	5.20	3.26	0.63	-2.67
6/25/2002	3.80	2.28	0.25	-2.29
6/24/2002	2.99	1.71	0.02	-2.09
6/23/2002	8.75	4.74	-0.53	-7.07
6/22/2002	6.67	3.39	-0.89	-6.18
6/21/2002	3.10	1.46	-0.67	-3.29
6/20/2002	4.57	1.96	-1.40	-5.52
6/19/2002	4.50	1.72	-1.84	-6.18
6/18/2002	4.75	1.56	-2.50	-7.43
6/17/2002	6.79	1.81	-4.49	-12.12
6/16/2002	8.47	1.65	-6.93	-17.27
6/15/2002	5.46	0.60	-5.48	-12.78
6/14/2002	3.70	0.04	-4.52	-9.99
6/13/2002	6.99	-0.78	-10.42	-21.92
6/12/2002	1.67	-0.44	-3.04	-6.13
6/11/2002	1.35	-0.62	-3.04	-5.91
6/10/2002	1.33	-0.95	-3.75	-7.05

Sodus Modified Blight Alert

8/20/2002	4.71	4.71	4.71	4.71
8/19/2002	6.67	6.67	6.67	6.67
8/18/2002	16.57	16.57	16.57	16.57
8/17/2002	13.45	13.45	13.45	13.45
8/16/2002	14.49	14.49	14.49	14.49
8/15/2002	1.88	1.88	1.88	1.88
8/14/2002	2.07	2.07	2.07	2.07
8/13/2002	1.55	1.55	1.55	1.55
8/12/2002	6.45	6.45	6.45	6.45
8/11/2002	8.20	8.20	8.20	8.20
8/10/2002	7.40	7.40	7.40	7.40
8/9/2002	7.28	7.28	7.28	7.28
8/8/2002	4.78	4.78	4.78	4.78
8/7/2002	3.18	3.18	3.18	3.18
8/6/2002	2.84	2.84	2.84	2.84
8/5/2002	7.12	7.12	7.12	7.12
8/4/2002	9.00	9.00	9.00	9.00
8/3/2002	6.22	6.22	6.22	6.22
8/2/2002	4.35	4.35	4.35	4.35
8/1/2002	8.70	8.70	8.70	8.70
7/31/2002	9.72	9.72	9.72	9.72
7/30/2002	12.36	12.36	12.36	12.36
7/29/2002	18.82	18.82	18.82	18.82
7/28/2002	9.75	9.75	9.75	9.75
7/27/2002	4.72	4.72	4.72	4.72
7/26/2002	3.93	3.93	3.93	3.93
7/25/2002	8.48	8.48	8.48	8.48
7/24/2002	8.19	8.19	8.19	8.19
7/23/2002	15.53	15.53	15.53	15.53
7/22/2002	6.29	6.29	6.29	6.29

7/21/2002	8.92	8.92	8.92	8.83
7/20/2002	13.30	13.30	13.30	13.14
7/19/2002	8.17	8.17	8.17	8.06
7/18/2002	1.82	1.82	1.82	1.79
7/17/2002	3.91	3.91	3.91	3.83
7/16/2002	4.36	4.36	4.36	4.25
7/15/2002	3.74	3.74	3.74	3.62
7/14/2002	7.45	7.45	7.45	7.17
7/13/2002	8.05	8.05	8.05	7.68
7/12/2002	7.64	7.64	7.64	7.22
7/11/2002	5.92	5.92	5.86	5.54
7/10/2002	15.93	15.93	15.75	14.74
7/9/2002	1.72	1.72	1.69	1.57
7/8/2002	3.19	3.19	3.14	2.88
7/7/2002	4.76	4.76	4.66	4.22
7/6/2002	6.70	6.70	6.53	5.85
7/5/2002	1.77	1.77	1.72	1.52
7/4/2002	0.47	0.47	0.45	0.40
7/3/2002	1.32	1.32	1.25	1.08
7/2/2002	1.02	1.02	0.96	0.82
7/1/2002	7.17	7.10	6.71	5.65
6/30/2002	8.19	8.10	7.58	6.29
6/29/2002	8.98	8.86	8.21	6.71
6/28/2002	16.28	16.01	14.67	11.79
6/27/2002	13.48	13.21	11.97	9.46
6/26/2002	7.18	7.00	6.27	4.87
6/25/2002	5.41	5.24	4.64	3.54
6/24/2002	4.41	4.24	3.71	2.77
6/23/2002	13.39	12.78	11.05	8.05
6/22/2002	10.62	10.04	8.57	6.09
6/21/2002	5.11	4.83	4.07	2.81
6/20/2002	7.88	7.38	6.12	4.11
6/19/2002	8.14	7.54	6.16	4.00
6/18/2002	9.06	8.30	6.68	4.18
6/17/2002	13.71	12.42	9.82	5.90
6/16/2002	18.19	16.30	12.65	7.24
6/15/2002	12.56	11.13	8.47	4.59
6/14/2002	9.17	8.03	5.98	3.04
6/13/2002	18.85	16.29	11.87	5.59
6/12/2002	4.94	4.21	2.99	1.28
6/11/2002	4.47	3.76	2.60	0.99

Sodus

Date	Alternaria		MI	Botrytis*	D. Mildew
8/20/2002	5.0	H.Risk	27	IIP	Unfavorable
8/19/2002	5.7	H.Risk	48	IIP	Unfavorable
8/18/2002	6.3	H.Risk	71	SIP	Unfavorable
8/17/2002	6.7	H.Risk	2	IIP	Unfavorable
8/16/2002	6.0	H.Risk	2	IIP	Unfavorable
8/15/2002	5.3	H.Risk	2	IIP	Unfavorable
8/14/2002	5.3	H.Risk	2	IIP	Unfavorable
8/13/2002	5.7	H.Risk	0	IIP	Unfavorable
8/11/2002	5.3	H.Risk	0	IIP	Unfavorable
8/10/2002	5.0	H.Risk	0	IIP	Favorable
8/9/2002	4.7	H.Risk	0	IIP	Unfavorable
8/8/2002	5.0	H.Risk	0	IIP	Unfavorable

8/7/2002	5.3	H.Risk	0	IIP	Unfavorable
8/6/2002	6.0	H.Risk	0	IIP	Unfavorable
8/5/2002	6.3	H.Risk	0	IIP	Unfavorable
8/4/2002	6.0	H.Risk	1	IIP	Unfavorable
8/3/2002	5.7	H.Risk	2	IIP	Unfavorable
8/2/2002	5.7	H.Risk	2	IIP	Unfavorable
8/1/2002	6.3	H.Risk	13	IIP	Unfavorable
7/31/2002	6.7	H.Risk	66	SIP	Unfavorable
7/30/2002	6.7	H.Risk	66	SIP	Unfavorable
7/29/2002	6.0	H.Risk	61	SIP	Unfavorable
7/28/2002	4.3	L.Risk	1	IIP	Unfavorable
7/27/2002	5.3	H.Risk	3	IIP	Unfavorable
7/26/2002	5.0	H.Risk	10	IIP	Unfavorable
7/25/2002	5.7	H.Risk	60	SIP	Favorable
7/24/2002	5.7	H.Risk	37	IIP	Unfavorable
7/23/2002	4.3	L.Risk	2	IIP	Unfavorable
7/22/2002	6.3	H.Risk	9	IIP	Unfavorable
7/21/2002	6.7	H.Risk	45	IIP	Favorable
7/20/2002	6.3	H.Risk	10	IIP	Favorable
7/19/2002	4.7	H.Risk	0	IIP	Unfavorable
7/18/2002	5.0	H.Risk	1	IIP	Unfavorable
7/17/2002	5.0	H.Risk	0	IIP	Unfavorable
7/16/2002	5.3	H.Risk	0	IIP	Unfavorable
7/15/2002	5.7	H.Risk	0	IIP	Unfavorable
7/14/2002	6.0	H.Risk	0	IIP	Unfavorable
7/13/2002	5.3	H.Risk	0	IIP	Favorable
7/12/2002	5.0	H.Risk	25	IIP	Favorable
7/11/2002	4.7	H.Risk	0	IIP	Unfavorable
7/10/2002	5.0	H.Risk	0	IIP	Unfavorable
7/9/2002	5.0	H.Risk	0	IIP	Unfavorable
7/8/2002	5.3	H.Risk	0	IIP	Unfavorable
7/7/2002	5.3	H.Risk	0	IIP	Unfavorable
7/6/2002	5.3	H.Risk	1	IIP	Unfavorable
7/5/2002	5.0	H.Risk	2	IIP	Unfavorable
7/4/2002	5.0	H.Risk	2	IIP	Unfavorable
7/3/2002	5.3	H.Risk	2	IIP	Unfavorable
7/2/2002	6.0	H.Risk	1	IIP	Unfavorable
7/1/2002	6.0	H.Risk	3	IIP	Unfavorable
6/30/2002	6.3	H.Risk	37	IIP	Unfavorable
6/29/2002	6.3	H.Risk	72	SIP	Unfavorable
6/28/2002	6.3	H.Risk	84	SIP	Unfavorable
6/27/2002	6.0	H.Risk	41	IIP	Unfavorable
6/25/2002	5.7	H.Risk	20	IIP	Unfavorable
6/24/2002	6.0	H.Risk	10	IIP	Unfavorable
6/23/2002	6.0	H.Risk	7	IIP	Favorable
6/22/2002	5.0	H.Risk	0	IIP	Unfavorable
6/21/2002	5.7	H.Risk	0	IIP	Unfavorable
6/20/2002	6.0	H.Risk	20	IIP	Favorable
6/19/2002	6.0	H.Risk	79	SIP	Favorable
6/18/2002	6.0	H.Risk	92	SIP	Favorable
6/17/2002	6.3	H.Risk	96	SIP	Favorable
6/16/2002	5.7	H.Risk	95	SIP	Unfavorable
6/15/2002	6.0	H.Risk	94	SIP	Unfavorable
6/14/2002	5.0	H.Risk	40	IIP	Unfavorable
6/13/2002	6.3	H.Risk	3	IIP	Favorable
6/12/2002	5.3	H.Risk	0	IIP	Unfavorable
6/11/2002	4.7	H.Risk	0	IIP	Unfavorable

sodus June Summary

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07/02/02	0	0	0	0.00	0
07/01/02	0	0	0	0.00	0
06/30/02	83.5	62.3	0	0.00	9
06/29/02	81.1	62.3	0	0.00	7
06/28/02	76.9	64.2	9	0.02	10
06/27/02	83.2	45	8	0.42	17
06/26/02	84.8	69	2	0.13	6
06/25/02	83.4	60.5	4	0.15	9
06/24/02	74	61.3	0	0.00	4
06/23/02	86	66.6	0	0.00	7
06/22/02	76.6	65.1	11	0.01	15
06/21/02	86	60.2	2	0.05	7
06/20/02	83.6	51.7	0	0.00	8
06/19/02	78	48.4	0	0.00	8
06/18/02	71.7	50.2	0	0.00	9
06/17/02	66.7	53.1	0	0.01	11
06/16/02	65.3	54.8	8	0.03	17
06/15/02	63.7	57.8	12	1.29	21
06/14/02	63.8	59.7	9	1.88	16
06/13/02	70.1	57.6	0	0.00	10
06/12/02	75.6	57.8	10	0.08	21
06/11/02	86.4	61.3	0	0.00	2
06/10/02	76	54.7	0	0.00	3
06/09/02	78.2	61.8	0	0.00	2
06/08/02	80.3	46.6	0	0.00	8
06/07/02	69.5	48	0	0.00	9
06/06/02	60.5	53.2	7	0.15	11
06/05/02	78.5	62.6	4	0.13	16
06/04/02	66.4	39	2	0.08	15
06/03/02	61	43.9	0	0.00	3
06/02/02	64.6	50.9	7	0.07	8
06/01/02	79.5	56.8	0		

2002 Onion IPM, Thrips - Grower 4

