Cranberry Scouting Procedures
From the Wisconsin State Cranberry Growers Association (WSCGA)
Cranberry Grower Resource Notebook

HOW TO SCOUT FOR CRANBERRY PESTS

1. Approach and view the cranberry bed. Consider walking around the perimeter of beds that have a history of damage to make initial observations. (Walk on the dikes, not in the beds.) Make note of any observations made.
2. Indicate on a marsh map any obvious damage areas ("hot spots").
3. Enter the bed.
4. Record plant growth stage.
5. Diseases and insects are more common on bed edges. Examine any suspicious areas. Record observations.
6. Select an "exterior site" with symptoms of stress (discolored leaves, etc.). If no such sites are observed, select a site that is representative of the exterior areas of the bed. This site should be within 5 feet of the edge of the bed, preferably in an area that is frequently missed by the irrigation or chemigation system. (See Table 1, "Sweep Sampling – Number of Sites per Acre," to determine the number of sites to sample and the number of sweeps to perform on an individual bed.)
   A. Sweep 20 times per sampling site, with a 15-inch diameter, long-handle net.

      Note: If insects are too numerous, place sweep net contents in a collecting tray or jar. Count the contents during that farm visit, if possible. Any larvae, moths, or beetles that cannot be identified should be preserved and identified by a County Extension Agent or another specialist.

   B. If scouting when berries are present, visually examine 25 berries. (Use the berries collected in the sweep net, when possible.) Record the number of berries with insect eggs on them (look at the bloom end of the berry for cranberry fruitworm eggs), and make note of observations of insect feeding or disease damage. Cut the berries open and examine seed cavities for cottonball mycelium. Record the number of prematurely red berries, which are an indication of fruitworm larval activity.

   C. Visual observations play an important role in pest detection. Perform two visual observations per set of 20 sweeps on each bed, plus an additional two observations per bed. (Ex.: Three sets of 20 sweeps should be performed on a 2-acre bed. Perform 2 visual observations per each set of 20 sweeps, plus 2 additional observations, for a total of 8 visual observations on this 2-acre bed.) Certain insects or diseases may not be obvious on the above ground portion of the cranberry plant. Examine runners for flea beetle and cranberry girdler larvae, or white grub activity, especially in suspicious areas or "hot spots".

   D. Record all observations and sampling results on an appropriate scouting form. Indicate whether each sampling site is an "exterior" or "interior" site, and draw each site location on a map of the marsh.
7. Select "interior sites" and repeat the monitoring and scouting process (item 6, steps A-D). Select interior sites for sampling that <u>best represent the entire bed</u>.

8. Examine any "hot spots," record observations made, and indicate the potential reason(s) for the "hot spots."
9. Record the number of insects in pheromone traps. There should be one trapping station installed per 10 acres of producing cranberries, or one trapping station for every 2 acres of cranberries scouted. Fewer pheromone traps may be sufficient on management units with an established history of scouting.

TABLE 1

Sweep Sampling – Number of Sites per Acre

Size of Bed	Number of Sites (one site = 20 sweeps)	Total Sweeps
<1.00 acres	1 Internal + 1 External	40
1.00 – 2.49 acres	2 Internal + 1 External	60
2.50 – 4.00 acres	3 Internal + 1 External	80
4.01 – 6.00 acres	3 Internal + 2 External	100
6.01 – 8.00 acres	4 Internal + 2 External	120

Notes: "Internal" site means that sweeping efforts should begin no closer than 15 feet from the edge of the bed. "External" site means that sweeping efforts should be conducted within the first 5 feet from the edge of the bed. Always sweep in the direction of vine growth.

Economic Thresholds for Wisconsin Cranberry Pests

Insects	**Average Counts per 20 Sweeps**
Blackheaded fireworm	2 larvae
Sparganothis fruitworm	2 larvae
Spanworms	10-15 larvae (based upon larvae size)
Cranberry flea beetle	10 adults
Cranberry weevil	4 adults
False armyworm (cutworm)	4 larvae
Blossom worm (cutworm)	4 larvae
Cranberry fruitworm	(See Part 3, "Sampling for Cranberry Fruitworm")
Cranberry tipworm	None developed
Diseases	**Thresholds**
Tipblight / Cottonball	None developed
Fruit rots	None developed
Leaf spots	None developed
Upright dieback	None developed
Weeds	None developed

Notes: Economic threshold numbers are based on average numbers of insects collected using twenty, 180-degree sweeps with a 15-inch diameter, long-handle net. These thresholds are not absolute and, by definition, will vary as economic conditions change.

Sampling for Cranberry Fruitworm

To assess the appropriate timing of insecticide applications for cranberry fruitworm, first determine the "percent out-of-bloom" of the cranberry uprights. This method was developed by S. Roberts and C. Brodel (U. of Mass. Cranberry Experiment Station).

Sampling Method:

(1) At each sample site (preferably 2 to 4 sites per bed or variety) randomly select 10 uprights and count the number of pods and flowers vs. pinheads and uprights with fruit on them. Record the information as follows:

Date Sampled:		**Bed Exterior**				**Bed Interior**				
		Site #1		**Site #2**		**Site #3**		**Site #4**		
Pods & Flowers	=		+		+		+		=	
Pinheads & Fruit	=		+		+		+		=	
								GRAND TOTAL	=	

(2) Add the total number of Pods & Flowers for all sites.
(3) Add the total number of Pinheads & Fruit for all sites.
(4) Add the totals to get a Grand Total.
(5) Divide the total number of Pinheads & Fruit by the Grand Total
(6) Multiply by 100. The product is the percent of uprights that are out of bloom (the "% Out of Bloom").
(7) See the Treatment Recommendations, below.

Formula: (Total Pinheads & Fruit ÷ Grand Total) * 100 = _____% Out of Bloom

Example:

Date Sampled:	*July 2nd*	**Bed Exterior**				**Bed Interior**				
		Site #1		**Site #2**		**Site #3**		**Site #4**		
Pods & Flowers	=	*15*	+	*13*	+	*20*	+	*13*	=	*61*
Pinheads & Fruit	=	*20*	+	*21*	+	*19*	+	*25*	=	*85*
								GRAND TOTAL	=	*146*

Calculation: (85 ÷ 146) * 100 = 58% Out of Bloom

Treatment Recommendations:

First Cranberry Fruitworm Spray: For first application date, add 7 to 9 days to the approximate date of "50% out-of-bloom." For example, make a first application during the period of July 9 through July 11, if 50% out-of-bloom was determined to be July 2.

Second Cranberry Fruitworm Spray: For second application date, add 10 days to the date of the first application. For example, if the first application was made between July 9 and July 11, the second application should be made between July 19 and July 21.

How to Find Cranberry Fruitworm Eggs:

Pick 25 berries per sample site. Inspect these berries on the blossom (or calyx) end for fruitworm eggs, using a 10x magnifying lens. Locating the eggs may be a good indicator for the presence of a potential outbreak and can assist in the timing of fruitworm applications.

Types of Damage Associated with Eleven Cranberry Insect Pests

Feeds On	**TW**	**BS**	**GS**	**CW**	**SFW**	**CG**	**BFW**	**CFW**	**FB**	**RL**	**WG**
Leaves		*	*	*A	*		*		*A	*	
Blossom buds		*	*	*L&A						*	
Berries		*		*A	*		*	*			
Roots/runners (below ground)						*			*L		*
Terminal buds	*	*	*	*A	*		*			*	
Pods		*	*	*L&A							
Clips blossoms, pods, berries		*		*							
Webs uprights					*		*				
Leaf cupping (from leaf feeding)	*										
Mines leaves & term. buds							*				

Key:

A	Adults
L	Larvae
BS	Brown spanworm
BFW	Blackheaded fireworm
CFW	Cranberry fruitworm
CG	Cranberry girdler
CW	Cranberry weevil
FB	Flea beetle
GS	Green spanworm
RL	Rannoch looper
SFW	*Sparganothis* fruitworm
TW	Tipworm
WG	White grub