

Cup Traps as a Means for Monitoring Adult Flight of the Russian Wheat Aphid (Diuraphis Noxia)

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Purpose:

To devise a simple feasible and reliable trapping method for the adult Russian Wheat Aphid that would determine an estimate of migration flight in a locale, or field by field basis.

Methods & Materials:

A white, 16 ounce styrofoam cup was placed upside down over a 4 ft. wooden stake. Push-pins were used to secure the cup to the stake. The cup was then covered with liberal amounts of petroleum jelly (Vaseline®). The traps were changed every 3-4 days. After a cup was removed and replaced, it ws taken back to the laboratory and rotated under a microscope for aphid identification. Four traps per direction (NSE&W) were placed around a 4-hectare barley field, 3 meters apart, with a severe RWA infestation.

Whole plant counts were made on a weekly basis so that comparisons could be made between whole plant counts and cup catches. A USDA weather station ca 100 meters from the barley field was used to record precipitation, wind speed, wind direction, and temperature throughout the sampling period.

Results & Discussion:

Table 1 presents the whole plant counts from the infested barley field. It indicates that on July 20 a mean of 71 aphids per plant existed, and

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this was the highest observed over the whole plant sampling date. The ratio of aptera/wing pads present/alate was 60/10/1 on the peek sampling date of July 20.

The mean number of aphids per four cups per field direction is given in Table 2. The highest capture for adult RWA's occurred on July 25. This is five days after the peek in whole plant counts shown in Table 1.

From all the experimental factors measured, the mean wind vector averages over daylight hours appeared to show a directional relationship. That is, the predominant southeast winds appeared to blow the aphids across the field from the southeast corner to the northwest corner. This consequently made the north and west cup traps yield a higher number of aphids per cup, Table 2.

This data shows that cup traps can be used to monitor RWA's in cultivated wheat and barley areas. The direction of which the cups are placed around a field may be influenced by predominant winds.

Table 1. Mean Number of Aphids per Whole Plant Randomly Collected from an Infested Barley Field CSU Experiment Station, Akron, CO 1988.

	Developmental Stage of RWA's			
Date	aptera	wing pads	alata	Total
6-18	.7±.6[a]	.3±.6	.2±.4	12
6-25	22±11	0	0	22
7- 6	30±43	1± 4	0± 0	31
7-11	47±41	3± 2	.4±.4	49
7-20	60±53	10±10	.9±.9	71
7-25	16±19	1± 1	.4±.1	17

[a] Mean number of aphids/plant after 20 whole plant counts ± standard error.

Table 2. Mean Number of Russian Wheat Aphids Captured on Cup Traps Placed Around an Infested Barley Field, CSU Experiment Station, Akron, CO 1988.

Collection Date	Cup Placement Direction				Mean Wind Vector[b]
	North	South	East	West	
7-22	5±3 [a]	2±1	3± 1	5±1	117
7-25	15±3	3±3	5± 2	7±4	115
7-29	5±1	3±1	2± 1	4±2	198
8- 2	4±3	1±1	.2±.2	6±3	225
8- 5	.2±.2	0	0	0	67
8- 9	0	.2±.2	.2±.2	0	211
8-14	0	0	0	0	148
8-17	0	0	0	0	284

[a] Mean number of aphids ± standard error 4 cups per field direction.

[b] Mean wind vector readings were averaged over daylight hours only. 0-90 = NW, 90-180 = SE, 180-270 = SW, 270-360 = NE.