RUSSIAN WHEAT APHID FERTILIT

SOUTHEAST COLORA

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	LOCATION					
	WALSH	EADS	PUNKIN CENTER	SIMLA	LAMAR	ARAPAHOE
			0 LBS NITROGEN			
% Plants Infested	47	4	13	19	48	64
% Tillers Infested	14	1	2	3	15	22
			25 LBS NITROGEN			
% Plants Infested	81	3	11	6	75	76
% Tillers Infested	17	1	2	1	24	30
			50 LBS NITROGEN			
% Plants Infested	75	0	21	9	70	85
% Tillers Infested	22	0	3	1	24	34
			75 LBS NITROGEN			
% Plants Infested	81	3	16	10	85	86
% Tillers Infested	25	1	3	1	50	40

RUSSIAN WHEAT APHID FERTILITY TEST PLOT EVALUATIONS, SOUTHEAST COLORADO, 1988 - A fertility test trial was initiated on established wheat to determine if spring applications of Nitrogen fertilizer could be used to minimize the impact of the RWA. Applications of nitrogen were made in March of 1988 in several locations across the Eastern Plains. Nitrogen was used at the following rates; 0 lbs., 25 lbs., 50 lbs., and 75 lbs. Nitrogen. Each treatment was replicated four times. Variety TAM 107 was used at Walsh, Eads, Punkin Center; variety Newton was used at Simla; variety Sandy was used at Lamar; and an unknown variety was used at Arapahoe.

Plots were evaluated by determining the percent of plants infested and the percent of tillers infested. Percent infested plants was determined by evaluating the number of infested plants (based upon symptomatic tillers and presence of RWA) in ten plants. Percent infested tillers was determined by counting the number of tillers infested with RWA in one hundred.

CUP TRAPS 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 and Materials:

A white, 16-ounce styrofoam cup was placed upside down over a 4 foot 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 was taken back to the laboratory and rotated under a microscope for aphid identification. Four traps per direction (N, S, E, and 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 and 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 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 peak 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 peak in whole plant counts shown in Table 1.

From all the experimental factors measured, the mean wind vector averaged 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

Date	6-18	6-25	7-6	7-11	7-20	7-25
Total Aphids	12	22	31	49	71	17

Table 2. Mean number of RWA captured on cup traps placed around an infested barley field

COLLECTION DATE	CUP PLACEMENT DIRECTION* NORTH	SOUTH	EAST	WEST	MEAN** WIND VECTOR
7-22	5±3	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

*Mean number of aphids ± standard error 4 cups per field direction.
**Mean wind vector readings were averaged over daylight hours only. 0-90=NW, 90-180=SE, 180-270=SW, 270-360=NE.

RUSSIAN WHEAT APHIDS - POTENTIAL OVERSUMMERING HOST PLANTS

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RUSSIAN WHEAT APHID (Diuraphis noxia) POTENTIAL OVERSUMMERING HOST PLANTS - Grass species that were green during the period between wheat harvest and the emergence of the new crop in the fall were sampled weekly at two sites to determine potential oversummering Russian wheat aphid host plants. The sites were as follows:

Site #1 - is a cultivated wheat and barley area termed a Loamy Plains Range site with a draw running through it. The location was two miles south and two miles west of Arriba, Colorado in Lincoln County.

Site #2 - is characterized as a Sandy Plains Range site on the edge of a cultivated wheat area with native grasses. The location is four miles northwest of Akron, Colorado in Washington County.

Samples were taken by clipping the plant at ground level, taking enough plant material to fill a one gallon Ziploc bag. Samples were chilled, carried to the laboratory and then placed in Berlese funnels for 24 hours to extract any live aphids. Extracted Russian wheat aphids were counted as wingless (apterae), winged (alatae) or in the process of forming wings.

Results of these studies are presented in Figures 1 through 6. Canada wildrye was the largest source of Russian wheat aphids at the Arriba site, while, crested wheatgrass appeared to be the better host from the Akron location. Barnyard grass, Canada wildrye and Western wheatgrass were three grass species that served as oversummering hosts at both location. Blue grama and Cheatgrass were abundant hosts at Arriba and were not at the Akron location. Crested wheatgrass, Green foxtail, and Prairie sandreed were abundant hosts at Akron and not at Arriba. This study indicates the importance of annual grasses (Green foxtail, Barnyard grass, Cheat grass) that are often present in wheat stubble between harvest and the establishment of the new wheat crop.

This survey shows that there are annual and perennial grasses that obviously helped "oversummer" the RWA. Whether Russian wheat aphids can reproduce on these plants is still unanswered. Control of volunteer wheat and barley in areas where RWA exists is a must for wheat production.

Number of Aphids

Number of Aphids