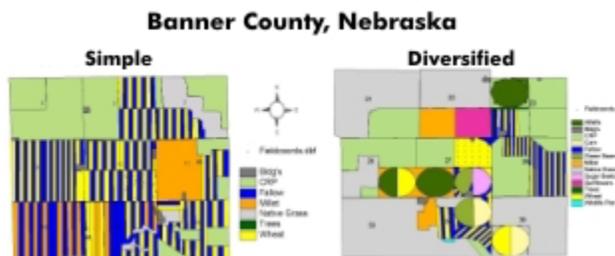


c. Nebraska/Wyoming Demonstration Sites

Phase II, Year 1 (2002-2003)

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Nebraska Sites



The paired locations of sites in Nebraska were located in western Banner County. The areas surrounding both fields have a large amount of rangeland grass or CRP grassland. Sampling of these locations began in the fall of 2002 and continued until the end of the season in 2003. Overall the aphid populations were low until late in the season.

Diversified rotation: The grower of the diversified-rotation field shown at left suffered very serious drought losses in 2002, averaging less than 5 bushels of wheat per acre on his whole operation. His targeted rotation is winter wheat / sunflowers / proso millet / spring crop. The spring crop is still the unknown in his rotation as he has not arrived at a good option for his system. He would like to include barley but because of potential Russian wheat aphid problems he has not consistently adopted this. A resistant barley variety would fit into his system well as he raises cattle and could use the barley for feed. His second option for this fourth year is a second year of proso millet. This option got him into trouble in 2002 as his millet was severely drought stressed until late in the season when it began to grow and mature very late. He was not able to get his millet off until well into October, and he did not plant his wheat until October 10-11. This is a full month after the recommended planting date for the area. The wheat was just barely through the ground when it went dormant with the cool weather. In the spring the wheat did resume growth but through the winter there had been a tremendous infestation of kangaroo rats that had moved into the field and destroyed a significant amount of wheat. Close to 10% of the wheat had been torn up or consumed by these rodents.

The wheat was growing well through the spring, but it was significantly delayed compared to the wheat in the surrounding areas. Because of the much delayed planting, no aphids were seen in the field until May 21 when a 7% infestation of RWA was observed. The infestation quickly increased to about 35% on June 5. Because this field had been planted to Halt, a RWA resistant variety, the extent of the infestation and the rapid buildup was very surprising. At this point we had heard that Colorado State had already identified the same problem in resistant varieties in Colorado. Therefore, we assumed that we also were seeing the presence of this new RWA biotype. Infestations increased until July 9 when 600 RWA per row foot were found in the Berlese samples. The seriousness of the infestation was largely due to the lateness of this wheat field because the surrounding fields planted to susceptible varieties that were all at more mature stages showed no significant sign of serious RWA infestation. Dry and

hot conditions during late June and early July had a negative effect on this field and the field averaged 18 bushels per acre (harvested July 22). Clearly, this yield had been impacted by late planting, rodents, RWA and late season drought.

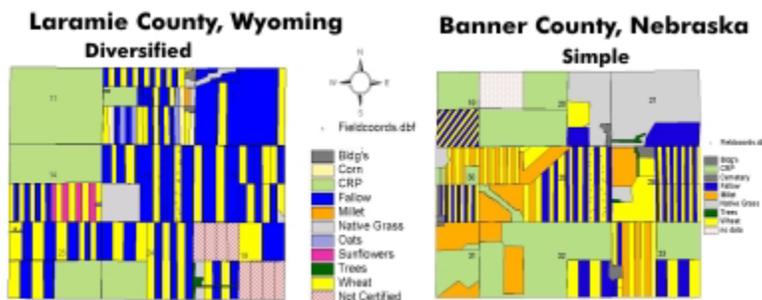
Greenbug populations in the field were first found on June 5 with only a 1% infestation level and 25 per row foot. Greenbug populations did not increase from this point. Because of the high aphid populations, coccinellid populations were very high in this field. Coccinellid populations began to increase on June 18 about a month after the aphids showed up and increased to a high of 14 adults and 14 larvae per 25 sweeps or 1.1 coccinellids per sweep.

Very few grass weeds were observed in the winter wheat field or the adjacent summer crop fields. In the spring there were a few broadleaf weeds in the winter wheat field, but these were controlled with herbicides. Insect pests were not a big problem in the alternate crops, but pheromone sampling for the sunflower head moth indicated a significant populations and the field was treated with insecticide. Control of the head moth was good, but later infestations may have resulted in a low-moderate infection rate of *Rhizopus* head rot in the sunflowers. No additional pest problems were noted in this rotational system.

Wheat / fallow rotation: The grower has farmed in the winter wheat / fallow system for many years. He planted his winter wheat just a little late due to area rains (Sept. 13). A good stand was obtained in the fall and the crop went into the winter in very nice shape with no aphid infestations. Sampling in the spring indicated only a slight RWA infestation of 1% infested tillers. This infestation did not increase through the spring as it remained 1% until heading when it dropped. This drop is likely due to the difficulties of locating aphids within the wheat heads. Berlese samples indicated that aphid populations did increase through the heading period until we saw about 42 aphids per row foot on July 2. This field was harvested on July 13 and yielded an average of 40 bushels per acre. The only significant impact on yield during the season appeared to be moderate to severe drought stress occurring during the late season period.

No other insect pest or disease problems occurred in the field. As was expected for such low aphid infestation, coccinellid populations were low as well peaking at only 6 adults and larvae per 25 sweeps on July 2 just before full maturity. Weeds were not a problem in the fall in the growing wheat. However, the adjacent fallow fields had moderate to heavy infestations of volunteer wheat prior to wheat planting. Light to moderate infestations of feral rye and downy brome developed in the winter wheat fields over the winter and into the spring. No significant disease impacts were seen in the wheat.

Wyoming/Nebraska Sites



The two sites for this pair are located in Wyoming and just across the border in Nebraska. Growing conditions for this pair of locations was much better than most of the surrounding region. These areas saw considerably more rainfall both just before planting and through the season. Planting at both locations was delayed by rainy and wet conditions, but wheat establishment was excellent at both locations.

Diversified Rotation: The diversified-rotation grower in 2002 suffered very serious drought losses and averaged less than 5 bushels wheat per acre on his whole operation. As a result of the extremely dry conditions in 2002, he did not plant sunflowers as he had anticipated. Beginning in early August the rains began and he saw over 10 inches of rainfall in the next 6 weeks (normal annual precipitation ca. 13 inches). He planted somewhat late for the area on Sept. 18-19, but due to the adequate moisture, establishment and stands were good. These fields were planted to the RWA resistant varieties Halt and Prowers. No RWA infestations were seen in these fields until May 30 when a 1% infestation levels was found. These aphid levels did not increase and very low coccinellid populations were seen as well (0.45 /25 sweeps).

Very few grass weeds were observed in the winter wheat field. In the spring there were a few broadleaf weeds in the winter wheat field, but these were controlled with herbicides. No additional pest problems were observed in these fields through the course of the season, but in June a significant hail damaged the crop. After re-growth from the hail damage, the wheat was harvested on August 4-6 and it yielded 27.5 bushels. This is a good yield considering the impact of the hail that was seen.

This grower again did not plant sunflowers in 2003 and has changed his ideas on his rotations because of the serious dry conditions he has seen the last years. Since wheat harvest, we have identified another diversified rotational grower in the area and have initiated our fall 2003 sampling on this growers land.

Wheat/fallow rotation: This location is surrounded by a good deal of perennial grass including some CRP in the area. The section where the fields are located is cut up by grassed waterway and drainage. The wheat/fallow grower was delayed slightly in planting in the fall of

2002 because of rain. However, more than adequate rainfall during this period resulted in very good establishment and stand of wheat after planting on Sept 3-4 (cv. Ogallala). RWA populations were not observed in the fall but a 1% infestation was observed on April 29. This aphid population did not increase over the spring and only reached a 3% infestation on June 26. The maximum density of RWA was seen on June 26 also at 100 RWA per row foot. Maximum coccinellid levels were seen on June 11 at 6/25 sweeps. Very low numbers of Greenbugs were also seen (<1% infestation).

Weeds were not a problem in the fall in the growing wheat. However, the adjacent fallow fields had moderate to heavy infestations of volunteer wheat prior to wheat planting. Light to moderate infestations of feral rye and downy brome developed in the winter wheat fields over the winter and into the spring. No significant disease impacts were seen in the wheat. The fields were harvested on July 20 and the wheat yielded 41.6 bushels per acre, a very good yield for this area.