Drought Favors Grasshoppers

Grasshoppers have been increasing in parts of North Dakota (see IPM map) and infestations have been reported in sunflowers and field corn. Hot, dry weather increases grasshopper populations and can lead to hot spots or even localized outbreaks. As cereal grains are dried down and harvested, producers should be aware of grasshopper movements into row crops. According to the USDA NASS North Dakota Crop, Livestock & Weather Report of July 30th, cereal grain harvest progressed with barley at 33% harvested, durum wheat at 14% harvested, spring wheat at 26% harvested, and oats at 37% harvested. So, now is a good time to scout row crops for grasshopper infestation. Early detection is critical for preventing yield loss. Grasshopper damage usually starts in field margins and leaves/pods/kernels will be stripped and destroyed. An economic level of adult grasshoppers is 21-40 per square yard in field margins and 8-14 per square yard in the interior of field. Lentils are extremely sensitive to grasshopper damage and only 2 grasshoppers per square yard during flowering or pod development can reduce yields enough to warrant insecticide treatment. Please consult the 2012 North Dakota Field Crop Insect Management Guide for registered insecticides for grasshoppers by crop and the specific label for restrictions.

http://www.ag.ndsu.edu/pubs/plantsci/pests/e1143w1.htm
SUNFLOWER SEED MAGGOT HIGH

Lots of small, golden-brown pupae of a tephritid fly called Neotephritis finalis (or sunflower seed maggot) are being observed in the faces of sunflowers in North Dakota this year. See photographs. The pupa is usually surrounded by a small number of damaged florets or a deformed head.

This small fly has a body length of about ¼ inch with brown-gray lacelike wings. Adults emerge during late June or early July and lay eggs on the corolla of sunflower inflorescences. Larvae are maggots (headless and legless) and about 0.2 inch at maturity. The larval stage is completed in about 14 days. Larvae tunnel through the buds and young blooms causing deformed heads later in sunflower development, and often the floret is consumed before the seed is fertilized. The magnitude of damage to sunflower seeds by sunflower seed maggot larvae depends largely on the crop stage infested and population densities of sunflower seed maggot. The first generation pupates in the head and the second generation overwinters. Sunflower seed maggot has two complete generations per year in North Dakota.

In 2009 and 2010, insecticide timing and insecticide mode of action were evaluated for control of N. finalis at NCREC in Minot, Carrington REC, Prosper and Mapleton in North Dakota. Insecticide applications were applied at the R1 (early bud), R3 (late bud), R5.1 (early flowering), and R1+R3+R5.1 growth stages. Three different modes of actions were tested: pyrethroid insecticide (Asana XL at 5.8 fl oz/A), an organophosphate insecticide (Lorsban at 16 fl oz/A) and a combination of an organophosphate + a pyrethroid insecticide (Cobalt at 19 fl oz/A). Different insecticide timings and modes of action did not provide adequate control of adult N. finalis. Even three different insecticide timings applied at crucial periods of sunflower head development (R1+R3+R5.1) did not reduce the damage from N. finalis. Potential reasons for the lack of control include: 1) N. finalis is very mobile and can easily re-infest plots after insecticide application(s); 2) adult N. finalis can live for up to 78 days (Ganehirarachchi, unpublished data); and 3) the larval stage of N. finalis is protected in the developing sunflower bud or head.

Planting date was evaluated as a cultural pest management strategy for control of N. finalis in several production regions of North Dakota during 2009 and 2010. Late planting date (early to mid-June) reduced damage ratings and percentage of damaged heads for N. finalis compared to early planting dates (mid- to late May). Visual observations of adult N. finalis found that the majority of flies were found in the early planted sunflower (78.2 %) compared to the late planted sunflower (21.8%). Yield losses were reduced with late planting date when populations of N. finalis were high enough to cause damage. Results of this study showed that delayed planting is an effective integrated pest management strategy that can reduce head damage caused by N. finalis and mitigate yield losses. (Knodel et al., 2011 J. Econ. Entomol. 104(4): 1236-1244)
SPIDER MITE RESOURCES

Here are some excellent resources for learning more about scouting and decision-making for spider mites in soybeans.

University of Minnesota – Drs. Ken Ostlie & Bruce Potter
Managing two-spotted spider mite on soybeans
http://www.soybeans.umn.edu/pdfs/2012/spider-mites-on-soybeans.pdf

Purdue University video – Dr. Christian Krupke
Spider mites in droughty soybeans
http://www.youtube.com/watch?v=bxagRDR1Ft4

University of Wisconsin, Madison video – Dr. Eileen Cullen
Spider mites in soybean IPM
http://www.youtube.com/watch?v=55qqfX_0c-U&feature=related

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VOLUNTEER PEA OR SMALL GRAIN FOR ANIMAL FEED IN THE FALL

The 2012 growing season has been generally dry and especially in parts of western North Dakota there are reports of a hay crop shortage. There may be some opportunities to grow some animal feed after early season crops like peas and wheat are harvested. The opportunities of course depend on the availability of rainfall and residual soil moisture.

DRY PEA. Dry peas are being harvested and some fields are tilled just after pea harvest or may receive a late chemical burn-down to prepare the field for the next season. There are opportunities to utilize these fields for volunteer pea feed or a cover crop. At harvest a small percentage of the dry field pea seeds will have dropped to the ground, even when combines are well adjusted. These seeds may be stimulated to germinate and start growing. This may require a light harrowing of the field to incorporate the seed. Soil moisture is essential for germination to take place. As the stimulated volunteer plants follow a main crop of field peas, there will be high numbers of Rhizobium leguminosarum bacteria inoculum in the soil and nodulation is typically excellent. The growing pea plants will provide a soil cover and protect the soil from erosive forces. This system can make use of the remaining growing season since field peas are tolerant to minor frost. The total amount of biomass produced depends upon the pea plant density, the timing of initiation of regrowth, soil moisture, rainfall, and the date of a killing frost. However, there is not enough time left to expect to harvest a second dry pea crop for seed. The volunteer pea crop can be used for grazing. Research at Carrington in 2008, found that fall produced dry pea biomass reached 1,500 to 3,000 lb/a. After grazing, pea stubble can be worked into the soil as a green manure or left over the winter.

SMALL GRAINS. Similarly to dry pea, residual small grain seed such as wheat, barley or oats can be worked into the soil with a light harrowing to assure good seed to soil contact. Sufficient moisture in the top soil is needed for germination. The volunteer grain will take up some of the residual nitrogen, but as it is following a main crop just harvested, there may not be sufficient N available for the plants to maximize productivity.
If sufficient rain is available some additional nitrogen applied after emergence and establishment, to stimulate crop growth, may be beneficial. The risk of this system comes when winter wheat is planted in the neighborhood of the volunteer small grain crop. The green volunteer crop forms a “green bridge” for the Wheat Curl Mites that vector the wheat streak mosaic virus, a disease which can survive on grassy weeds, corn, and the volunteer grain. The mites might move from the growing volunteer crop to the newly seeded winter wheat, putting the winter crop at risk. Under good growing conditions a volunteer wheat crop can produce about 3,100-3,500 lb dry matter/a (see Table and photograph).

Dry pea or small grain volunteer systems both will use soil moisture and this may deplete the reserve for next year’s subsequent crop. Other options to increase the chances of getting a well-established stand of a feed crop is to broadcast some additional small grain seed or other species that develop well in the fall, such as radish. The systems described will work best with grazing as there is generally not enough tonnage to justify haying.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Lb/acre biomass (dry weight)</th>
<th>% crude protein</th>
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</thead>
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</tr>
<tr>
<td>2010</td>
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<td>Winter Wheat volunteers</td>
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<tr>
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<tr>
<td>2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spring Wheat volunteers</td>
<td>3144</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

*Just after the first killing frost of the season.*

Volunteer spring wheat research plots on Oct. 8, 2010.

Table 1. Dry matter and crude protein of volunteer wheat 2010-2011.

Hans Kandel  
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DOWNY MILDEW OF SOYBEAN

I have been asked about the yellow spots on the top of soybean leaves (Figure 1). Immediately opposite the yellow spots on the undersurface of the leaf is a white/gray cottony growth (Figures 2 and 3). The disease is downy mildew of soybeans. It frequently occurs in North Dakota, but seems to be a bit more common this year.

It would be extremely unusual for this disease to cause yield loss, it is more of an anomaly. I have observed incidence (how many plants have the disease) and severity (how severely the plants are infected) are both very low the most severely infected leaf I could find is the one in the photograph. Also, the downy mildew pathogen on soybeans is different that the pathogen on sunflowers. The soybean pathogen produces small and infrequent leaf spots; whereas the sunflower pathogen produces dramatic stunting and plant death. The more common problem we have with downy mildew in soybeans is that it is often confused with white mold because of the fuzzy growth.

UPDATE ON SUNFLOWER DISEASES

Dr. Tom Gulya visited 54 fields last week in south central and south western North Dakota. He observed 17 fields with traces of downy mildew, and that was practically the only disease observed. It was particularly noteworthy that not a single plant affected by rust, Sclerotina stalk rot or Phomopsis stem canker was observed in the 54 fields. The only problems observed were occasional fields with grasshopper damage or herbicide spray drift damage at field margins. In general, the sunflowers throughout North Dakota have very little disease at this time, and look fairly good despite the heat and lack of rain.

Sam Markell
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The effects of early blight in Minnesota on 31 July 2012 caused brown speckling on leaves and leaf necrosis in fields.
IPM SURVEY, JULY 23-27

Wheat: Field scouts are finishing up their wheat survey now, as the crop is mature in many areas, or is harvested. They scouted 33 wheat fields last week, and the average growth stage of those fields was early soft dough. Most of these scouted fields were in counties in the west central, northwest, or north central regions. Thirteen of the 33 wheat fields showed symptoms of *Fusarium head blight*, but the average field severity in these fields was only 0.5%. Nine fields had *loose smut* evident, with an average of 7% of the heads in these fields smutted. Eight of the 33 fields showed *black chaff* head symptoms, six showed *BYDV* symptoms, and two still had evident *stripe rust* symptoms. One-third of the scouted fields also showed signs of *wheat stem maggot* injury, with an average of 8% of the heads in the affected fields showing the white heads and feeding damage at the first node evident.

Sunflower and Soybean: Field scouts also looked at 30 sunflower fields last week, and two of these had *downy mildew* symptoms; none showed sunflower rust. Of the 56 soybean fields surveyed last week, 12 had a few *soybean aphids*, with the highest count per plant at 8 aphids, way below threshold numbers. Scouts will be looking more closely at soybean fields for *spider mite* damage this week.

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**IMPORTANT WEED GUIDE ERROR**

Page 16 in the ND Weed Control Guide incorrectly lists Affinity TankMix and Affinity BroadSpec as labeled for preharvest application in small grains. Both Affinity TankMix and Affinity BroadSpec have a 45 day PHI (preharvest interval) on their labels. Ally is correctly listed and is labeled for pre-harvest in cereals.

We apologize for this oversight.

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AROUND THE STATE

South-Central ND

According to NDAWN, rain during the past week (July 25-31) ranged from less than 0.1 inch (numerous sites) to 0.75 inches (Fingal, Linton and Oakes). Our row crops continue to primarily rely on stored soil moisture and continue using lots of water - e.g. average corn water use for the region on July 31 was 0.25-0.3 inches. Corn growing degree day (GDD) units, with a planting date of April 20 to July 31, range from 210-310 units ahead of the 5-year average. From April 20 to July 31, corn accumulated GDD units range from 1460 (Harvey) to 1740 (Oakes).
Harvest of winter wheat and barley is essentially complete, and spring wheat is in progress. Yield and quality of April-seeded spring crops is generally good. Row crop development continues to be rapid, primarily due to heat and moisture stress. Most corn is in the blister to milk (R2-3) stages. Soybean planted during the first half of May are in the full pod to beginning seed development (R3-4) stages. Continue monitoring soybean fields for aphids and especially spider mites. Dry bean are in the pod to early seed development (R2-5) stages. Sunflower are blooming (R5 stage) and scouting should be in progress for head-infesting insects.

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