IPM STUFF

Southwest MN 5/19/98

After a hectic spring of getting plots arranged and planted, which is a tough experience for someone with the organizational skills of the Tasmanian devil, things have calmed down enough to start a weekly, more or less, letter on crop pests for the 1998 growing season.

The warm and dry spring (outside of tornadoes and hailstorms) allowed planting and crop development to progress at a pace that is much ahead of normal. We will probably have a lot of "knee high" corn by the first of June. Parts of the SW MN area have missed significant rainfall this spring. In spite of the low precipitation the SWES is near long term average for soil moisture in the top 5 feet. Unfortunately, the soil moisture is not near the surface of the soil profile. Dry soils have impacted crop emergence and weed control. High winds last Sunday reminded me of photographs of the dust bowl with the amount of soil in the air. In addition to wind damaged soybeans, I have had reports that hail Monday night caused enough soybean stand loss in some areas for replanting. Yield of stands reduced below 100,000 can still be good. There are several factors to consider when assessing the remaining stand. Plants cut off below the cotyledons or below axillary buds will die. Are there many areas with gaps to cause weed control problems? Are the remaining plants heavily bruised allowing pathogens to enter or weakened plants from callus tissue? When can you get the stand replanted? Soybean yield potential becomes progressively less as plantings are delayed past mid-May. Refer to University of Minnesota Extension Publication F0-5701-C, “Soybean Growth and Development & Management for Replant Decisions", for more information.

Corn:

Corn depth of planting: As corn emerges, some growers noticed areas in the field where stand is thin. Corn seed was laying not germinated in dry soil. In a couple of cases I know of, the corn was planted too shallow. I seem to remember a lot of problems occurring last year because of shallow planted corn. These included poor plant vigor and problems with herbicide injury. What seems to be happening is that growers are checking their planting depth and it is at 1 1/2 inches. What they are not taking into account is that when some fields are worked, especially those with one pass, they can be quite loose. Settling of the soil causes the actual planting depth to be much shallower than it appeared. I always liked stepping on the row before I checked planting depth behind a corn planter. Corn, unlike orchids, does better when covered with a layer of soil. 1 1/2 inches should be considered a **minimum** depth for planting corn. It's safer to err on the deep side when planting. Shallow planting depth on soybeans is not quite as critical but 1 1/2 inches works well for them also. On the other side, planting to moisture does have practical limits in light of hard crusting rains. Perhaps implement manufacturers are putting too wide a range of depth adjustment on their planters. This is meant to be a reminder and not a high-toned lecture (I tend to fall off high places like soap boxes). Sometimes stuff happens. I planted part of a soybean plot with one of four rows dropping seed behind the closing wheels. Fortunately, cussing and muttering, kicking dirt over the offending rows and some timely rain let things work out ok.

Wireworms: Wireworm problems were observed in Brown, Martin, and Watonwan, Lyon and Traverse County fields. Some wireworms were still present even with warm soils. Above ground symptoms were stunted plants. Below ground symptoms were feeding scars on the radicle, seed, and mesocotyl. Wireworms should be considered if you are seeing stunted, malformed, or missing corn plants. A planter box insecticide treatment will be the most economical treatment if replanting is necessary. Judging by the current soil temperatures it would be risky to assume that warm soils will have caused wireworms to quit feeding for replant.

European corn borer: The black light trap has captured its first European corn borers of the season. Four male European corn borer were captured on 5/20/98. This is actually about one week later than I expected them with the warm spring. I was starting to worry that we had selected for a strain that weren't attracted to black light traps. Black light trap captures for the Southwest Experiment Station will be updated weekly at our website: http://www.swes.agri.umn.edu. Scouting for first generation corn borer will be earlier than last year.

Herbicides: The warm spring has caused corn to be ahead of schedule. Watch height restrictions on corn herbicides to avoid crop injury. Weeds, especially foxtail, are also growing quite well. Corn does not tolerate early season weed competition well.

Soybeans: In areas with adequate rainfall, stands are very good. Emergence has been uneven (not germinated to late V1) in fields with less moisture.

Adult bean leaf beetles are present in soybeans and causing leaf feeding symptoms on soybean leaves. These rarely cause economic problems.

Watch weed size when applying soybean herbicides.

Alfalfa:

I have not received calls on insect disease or other problems on alfalfa this spring. The dry spring weather has minimized the impacts of foliar diseases. 2nd year alfalfa on the station alfalfa is at bud stage at this time. Cutting in the area has started and growers should be prepared for an excellent first cutting if the weather cooperates.

Potato leafhopper: THEY'RE BACK!!! Sweeps averaged 0.7 adult leafhoppers per sweep 5/20/97. Potato leafhopper nymphs were not present in the sweeps. They probably came in on the weather systems last Friday and Monday. WATCH ALFALFA REGROWTH AFTER THE FIRST CUTTING CLOSELY.

Grasshoppers: They're back also. The hatch is well underway for two-striped. Mostly first and second instar nymphs are present. I have not seen any excessive numbers on the station yet but we still have red-legged and differential hatches to go. Sites were grasshoppers were abundant last fall should be scouted now. I will set up a couple of locations here on the station to monitor the progress of the hatch.

A Close Call

I am indebted (he says permanently) to Bob Byrnes, Lyon County Extension Educator, who's quick thinking saved a 520 drill marker arm disk from my head during the planting of a county plot. I do not have a budget that would cover replacing the hardware if it actually would have contacted my head on the way to the ground. I seem to remember a Gilligan's Island episode like this.

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IPM STUFF
1998-2
Southwest MN 6/02/98

Corn:
Thin corn and uneven corn stands are not uncommon this year. In addition to the planting depth and dry soil problem mentioned in the last issue, other factors are at work in some fields.
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Wireworms and White Grubs: This has been an exceptionally good year for wireworms and white grubs. As the weather continues warm and corn continues to develop, wireworm feeding should stop. White grub activity should also stop for the season in the next week or two as soils cool. I am uncertain why these two insects so active this spring as soils were warm very early in the season. As I wrote this article some small year white grubs feeding on soybeans near Clements were brought in. These darn insects keep life interesting. An ability to accurately predict biological phenomenon would allow me to write this newsletter from a private island in the South Pacific in January.

Fertilizer: I have seen several fields this year that have had injury from urea placed in a band on or below the seed. It's not pretty. Remember that 28% N is 1/2 urea.

European corn borer: Black light trap captures at the SWES remain low to moderate. 5/28/98 was the high point, it may have been the peak, for first generation flight. You can compare 97 and 98 results at the experiment station website: http://www.swes.agri.umn.edu. The cool weather forecast for this week will slow light trap captures and corn borer development.

Alfalfa:
Potato leafhopper: No increase in numbers at Lamberton and Danube. Adults are still averaging less than 1/ sweep. Scout alfalfa as soon as regrowth begins. You will have to scout alfalfa more or less weekly until August for leafhoppers.

Grasshoppers:
Grasshopper activity is starting to increase. Scouting now is important for several reasons. Firstly, to determine where grasshoppers are hatching. Secondly, to determine the number of hoppers present, their size and to a lesser extent the species present. Finally, scout fields to determine if and where unacceptable crop damage is occurring. Grasshoppers may be emerging in last year's soybean fields in addition to field borders. I have not seen anything but two striped nymphs as of 5/28. This means that the hatch is not nearly complete. Since the hatch is not complete, I would try to delay treating production areas until the largest nymphs are 4th instar. This needs to be tempered by crop injury. I would not let soybeans go past 50 % defoliation and some border treatments may be needed at this point. Treating this early probably means that a re-spray will be needed.

Remember that all grasshopper insecticides are not labeled for all crops. A revised grasshopper fact sheet put together by Ian MacRae, Ken Ostlie and myself is available at County extension offices in SW MN and on the SWES website. This fact sheet contains thresholds, scouting techniques and labeled insecticides.

Cool, wet weather will have a negative impact on 1st and possible 2nd instar nymphs. As grasshoppers mature they are more tolerant of adverse environmental conditions. I was discussing grasshoppers and the severe weather on 5/30/98 with Rich Kvols, Yellow Medicine County Extension Educator. A bright spot in the bad weather is that 1st and 2nd instar nymphs can be killed by a direct hit from a hailstone.

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IPM STUFF
1998-3
Southwest MN 6/09/98

It is early in the season and I have already redeveloped my annual pessimistic attitude. I am sure it comes from the fields I look at. I generally don't get calls on good looking fields. Cold weather has hindered crop growth but unfortunately has not slowed weed development nearly as much. Small grains started heading early this week.

FROST: Scattered frost has hit corn in portions of SW and West Central Minnesota. Low lying and peat areas as well as field edges are the most affected. In addition I have heard several comments from SW Minnesota that corn that was cultivated Friday or Saturday tended to suffer more frost damage. The only hypothesis that I can come up with is that cultivation dried the soil surface and lowered relative humidity at the ground level. This lower humidity would allow more frost damage. Beans being close to the ground at this point appear to have fared better.

What does this frost mean for corn at this time. If the new leaves in the whorl look ok the plant will recover. A successful recovery is less likely if the interior of the whorl is discolored or has water soaked appearance near the growing point and impossible if the growing point is dead.

CORN: Corn health has declined in some fields over the past week. "Green snap" has occurred in some fields during high winds on 6/03/98. Green snap is caused by an interaction with corn genetics, growing conditions, and plant age and can be aggravated by the application of growth regulator herbicides, esp. Dicamba. Some hybrids are more prone to this problem than others. In areas that had green snap, you have an indication of some of these hybrids are. This does not mean that they will "green snap" every year since part of the problem is environmental. Additionally, with the warm spring and rapid corn development, I am afraid that a considerable amount of Marksman, Clarity, ect. was applied to corn that was a little too large.

The weather turning from warm and dry to cold and cloudy has shown up in some fields as an off color.

Corn borer: After the warm start, cold temperatures have reduced growing degree days to just 48 GDD base 50/86 above the historic average. The cool weather should have interfered with mating at the later part of the hatch. It will also delay hatch and shot holing. At Lamberton temperatures and moth flights, hatch should have started this early this week. The peak hatch will be delayed to later next week (200-250 DD past first hatch) because of cold temperatures.

SOYBEANS
Iron chlorosis has shown up in some fields. There's plenty of iron present in the soil but soybean roots have a problem with uptake. Make notes of where the problem is occurring and use chlorosis tolerance as part of the selection criteria for varieties in these fields. Do not assume that soybean cyst nematodes cannot be part of the problem in chlorotic areas.

I observed a soybean field in Martin County that was suffering from damping off. Portions of the field had stood under water shortly after planting and symptoms of *Phytophthora* and *Rhizoctonia* were observed and both pathogens were probably present. Sometimes "field tolerance" works and sometimes it doesn't. To add salt to the wound, several immature white grubs were also observed.

GRASSHOPPERS: I started to observe first red-legged grasshopper nymphs last Friday (6/05/98). The bad news is this means that we have a considerable amount of hatch yet to occur. The good news is that the recent cool, wet weather will be unhealthy for the recently emerged "hoppers". It is not clear at this point whether this weather will result in economically acceptable control but every little bit helps.

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IPM STUFF
1998-4
Southwest MN 6/18/98

I had warned that this newsletter would be more or less weekly and this one is more than less. Canning Pea harvest has started and as usual this has brought some rain. It wouldn't be near as much fun without the mud. Some of the later planted peas have benefited from cool weather and look quite good at this point. Corn has canopied in most fields and early planted soybeans are about V4 stage or more.

ALFALFA
New seeding plots averaged 0.7 leafhoppers per sweep on 6-inch plants. Year old stands averaged 0.2 /sweep on 8 -10 " re-growth. One of the underlying principles of IPM is that the fields you are scouting probably have different leafhopper levels than reported here, so base any treatment decisions for a field on scouting.

The following thresholds are from Extension publication FO-3516-GO Alfalfa IPM: Sampling Alfalfa Insects by Bill Hutchison, University of Minnesota,Department of Entomology.

PLH Economic thresholds

Plant ht. (in)	PLH/Sweep
< 3	0.3
3-7	0.5
8-12	1.0
>12	2.0

CORN
Corn borer: First brood flight of corn borer continues to drag on. The cold temperatures earlier have contributed to this longer flight (since May 20). Degree- days (base 50/86) are 390 since May 20 so the oldest larvae should be 3rd instar next week. Since there seems to be a temporary shortage of corn borer larvae at the SWES (2 plants/200 with shotholing and no live larvae), I can neither confirm nor deny that this.

Similar to leafhopper counts, even though corn borers are not abundant at the Experiment Station, each corn field is unique should be scouted. Early planted largest corn in an area is the most likely to suffer corn borer problems. Depending on univoltine pressure the early part of the season might be interesting with overlapping flights.

Yellow leaves: Yellow top leaves are visible in many cornfields. This is actually good news as it means that leaves are unfurling from physiological and growth regulator induced wrapping of leaves.

SOYBEANS
Soybean cyst nematodes were visible on soybean roots last Wednesday (5/10). Unfortunately, the cysts, which are females attached to the roots, are not present through the season. If you suspect nematodes, which is usually prudent in SW Minnesota, and do not see cysts on the roots, I would still collect and submit a soil sample to the University of Minnesota Plant Disease Clinic.

GRASSHOPPERS: 4th instar (wing pads visible) two striped grasshoppers are present on the station. I also started seeing Differential nymphs (the last species to hatch) this week. Grasshopper hatch will continue into July. As grasshoppers get larger they become more mobile. Do not delay treating production area hot spots after winged adults are present.

SUMMER FIELD DAYS will be held at Lamberton Wednesday, June 24th. I hope to see a lot of you there.

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IPM STUFF
1998-5
Southwest MN 6/22/98

Some corn was flattened with the 60 plus mph winds last night. Most of this should recover to a respectable height although combining may be interesting. Soybeans started flowering on the station last Thursday. I am as confused as they are as to why they started flowering before the photo period shortened.

ALFALFA
Watch regrowth after second cutting very closely. Potato leafhoppers could be a problem as numbers have been building in the second crop. I would not treat for leafhoppers if less than 10 days from cutting.

CORN
Corn borer larva levels from the first flight appear to be generally low. BASE ANY INSECTICIDE TREATMENT DECISIONS ON FIELD SCOUTING. Some fields may have higher levels and require treatment but a blanket treatment of fields is not warranted, EVER. The high wind and rain last night was unfavorable to corn borer survival.

SOYBEANS
Severe iron chlorosis symptoms have appeared this year. Some are associated with soybean cyst nematode and some are not. Iron chlorosis is a complicated phenomenon and involves interactions between the soybean plant, several soil chemical factors including pH, and environmental conditions including soil moisture and temperature. Because of this complex interaction, a variety may not respond to iron chlorosis the same from year to year or field to field.

Roundup ready weed control is not perfect. Late emerging weeds may be problematic as canopy closure has occurred in drilled soybeans and is near for 30-inch rows. Some weeds are not as susceptible to Roundup and I have heard of some difficulties with Common lambsquarters at low rates and waterhemp. Nightshade and Waterhemp may be tough due to their late emergence capabilities. Just because a field has been treated with Roundup do not assume you can ignore weeds for the rest of the growing season.

GRASSHOPPERS
As mentioned with corn borers, insecticide treatments without first scouting to determine pest levels are economically and environmentally foolish. Unfortunately there is no way to make sound insect control decisions without some hard work.

SMALL GRAINS
Small grains should be scouted from late June to early July for armyworms. These insects migrate into Minnesota and outbreaks are unpredictable.

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IPM STUFF
1998-6
Southwest MN 7/06/98

I hope you managed to ignore crop problems during the Fourth of July weekend. The spring rush of decisions and problems is drawing to a close. This is a good time of year to look at fields that had fertility, weed, and disease problems earlier and start making management plans for next year. Unfortunately, there are still potential pest problems that might occur. I don't think we can all take it easy for the rest of the summer.

CORN: Some of the early-planted cornfields were trying to tassel by the Fourth of July. A few made it. The corn crop (except for the fields I get to look at) looks good.

European corn borer: On 7/02/98, I observed a newly molted 5th instar European corn borer at Lamberton. Fortunately, he did not have many little buddies. Stages observed ranged from egg mass to 5th instar. Plots averaged 0.25 % plants infested with no live borers. Light trap captures remain low at the SWES. The 1st generation of the multivoltine strain appears to be generally low in SW MN.

Now for the bad news: Without a distinct break between 1st generatios, the univoltine flight appears to have started at several locations. This is verified by the increase in the percentage of male corn borers in the SWES light trap. Scouting for univoltine corn borers should start in about 10 days. This flight is early enough to cause a high percentage loss per borer/plant.

Since I have a corn borer experiment going this season, this flight, like first generation, may not amount to much at Lamberton. With the proper incentives, I can be convinced to conduct an experiment on low crop prices.

SOYBEANS: Soybean cyst nematode females are readily visible on soybean roots in many of the fields I have recently checked. There seems to be some confusion between soybean cyst nematode damage and herbicide carryover injury in the countryside.

Iron chlorosis symptoms are moderating with the warmer weather.

Root diseases are present including *Fusarium* and *Rhizoctonia.* Areas that had standing water can expect to see more symptoms of these as well as mid-season Phytophthora occurring. *Rhizoctonia* lesions are reddish brown at or below the soil line. Lesions that penetrate to the pith are cause for concern. *Fusarium* infected roots often have red, orange or white mycelium visible. Externally, decay does not go above the soil line. Foliar symptoms can include interveinal chlorosis and necrosis as the fungi plug vascular tissue and phytotoxic compounds are produced. *Phytophthora* infections will extend above the soil surface and cause wilting/death of the entire plant.

GRASSHOPPERS
As the season progresses, I continue to get calls and observe fields with high numbers of grasshoppers. SW MN seems to be the hotspot for activity. The cold spell helped out temporarily with the early hatching grasshopper populations, especially in those areas that received rainfall at the same time. Additional Differential grasshopper hatch has occurred since then. Soybean treatment decisions will need to be made in the near future for three reasons: 1) Soybeans cannot tolerate as much defoliation in the reproductive stage. Additionally, unlike hail, grasshopper defoliation is often chronic. 2) I believe that we should be nearing the end of the hatch for 1998 and subsequent hatch should be minimal. 3) Adult two striped will be present shortly. They can be very mobile and larger hoppers will be harder to kill.

Do not treat fields or borders unless you have populations in the threatening range. (> 8-14 late instar nymphs/adults or more in field, 21-41 or more late instar nymphs/adults in field margins. Why the big range? Differential and Two-striped grasshoppers consume more foliage than the smaller red-legged and migratory. Additionally, losses from defoliation can be aggravated by dry conditions.

Hope to see some of you at Field Day at the West Central Experiment Station, Morris, on 7/09/98 and Field School at the Southern Experiment Station, Waseca, 7/14-15/98.

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IPM STUFF
1998-7
Southwest MN 8/04/98

The growing season is nearing the home stretch. It has been a hectic few weeks. Too many plots and too little time. Crops look good with the exception of those affected by the hail and wind of the 7/20 storm and unmanaged soybean cyst nematodes. In most cases, early-planted soybeans have completed blooming.

CORN: Fusarium symptoms were observed on corn roots at the SW Experiment Station. Whether these symptoms progress to stalk rot is dependent on the weather the rest of the growing season.

European corn borer: By degree-day projections, peak hatch for second generation should have occurred. Light trap captures at the SWES have remained low for second generation.

SOYBEANS: Soybean cyst nematode (SCN) is currently causing the most problems in soybean. Symptoms seem to be especially pronounced this year. This pest should not be taken lightly. Some of the problem fields have had the classic symptoms, stunting and chlorosis. owever, above ground SCN symptoms can be as slight as areas of the fields with less canopy (pinched rows). he most sinister scenario is a lack of above ground symptoms but poor bean yields. Cysts are still visible in many fields.

The soybean cyst nematode has more than one generation a year in southern Minnesota. Females may or may not be visible on the roots depending on the life stage of the population at the time. For this reason, you cannot use a visual inspection of the soybean roots as proof that nematodes are not present. Perhaps with SCN phenology models, timing of scouting based on root symptoms could be refined in the future. Until then, soil sampling is the best method to determine whether a SCN problem exists in a field and to estimate its severity.

Plot tours: One of the ways to combat this pest is through the use of resistant varieties
We have several plots in grower's fields with resistant and susceptible varieties. We have two tour dates for trials looking at nematode management using resistant soybeans. A plot day will be held at 1:30 PM, August 26 at the Lawrence Naber Jr. farm 2 miles south of Marshall. Contact the Lyon County Extension office for details. A field day will also be held on the Richard Wurtzberger farm, southwest of New Ulm at 1:30 PM, September 1. Contact the Brown County Extension office for details.

White mold: White mold has started to be visible in several fields. At this time the disease does not appear unusually severe. The recent cool wet weather was ideal for disease development. I expect that the potential for some further development of white mold problems is good this season. This fungus, however, is much better at sensing micro-climatic variables than I am. Even though it has not rained excessively in most areas, Fog and dew create 100% humidity. I have two plots looking at responses of varieties to white mold and applications of Lactofen for white mold control. A plot tour is scheduled for August 27, at 1:30 at the Wilbert and Joel Oberdieck farm south of Lewisville. Contact the Watonwan County Extension office for details.

Stem canker: This disease, Caused by the fungus *Diaporthe phaseolorum*, was observed causing death of soybeans in a Lyon county soybean field. Dead areas were large enough to be seen from a distance. This fungus may be seed borne or overwinter on residue. Symptoms are similar to *Phytophthora*, a dark brown stem lesion and death of plants with leaves remaining attached. Unlike Phytophthora, however, the stem lesions can start at nodes above the soil line.

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