Soybean aphid Alert
Do not assume 2013 soybean aphid problems are nearly over.

In portions of Minnesota, an increasing proportion of fields are projected to reach economic threshold the week of August 11. The large number of late planted fields may mean risk from soybean aphids will be later in the season than usual.

Unlike the spotty, early-season infestations created by aphids from moving from buckthorn and colonizing soybeans, current infestations are now much more widespread. Over the past couple of weeks, migrating winged aphids have created relatively uniform infestations in many fields. Recent weather has been almost ideal for aphid population increases.

As usual, the extent and level of infestations varies by geography, soybean maturity and other factors but in some areas of Minnesota, many fields are now approaching economic threshold. Over the next week or so, it is important that MN soybean producers assess aphid populations in their fields.

Soybean growth staging.
Being able to stage soybeans correctly is important for good pest management decisions. With respect to soybean aphids, yield is not yet fixed and loss can still occur into the R6 stage.

I am repeating the information on growth staging from the In the 2013-13 issue. For those of you who are more visually oriented see: http://extension.agron.iastate.edu/soybean/production_growthstages.html.
Soybean stages and yield loss

R3.0  Beginning pod – A pod 3/16 inch long at one of the upper 4 main stem nodes with a fully developed leaf.
The R3 stage averages 9 days (5-15)

R4.0  Full pod- A pod ¾ inch long at one of the upper 4 main stem nodes with a fully developed leaf
Beginning of critical yield developing period and sensitivity to stress
Stress likely to cause pod abortion and reduces pod number
The R4 stage averages 9 days (4-26).

R4.5  Terminal cluster of flowers opens
End of node production on main stem
Flowering on main stem ends, branch nodes and flowers until 5.5

R5.0  Beginning seed - A 1/8 inch seed is visible in a pod at one of the upper 4 main stem nodes with a fully developed leaf.
Most nutrient uptake occurs
Stress reduces pod number and seed number/pod
The R5 stage averages 15 days (11-10)

R5.5  Seeds fill ½ of the pod cavity at one of the upper 4 main stem nodes with a fully developed leaf
N fixation declines
Maximum vegetative development (nodes, height, leaf area)
Start of rapid dry matter accumulation in seed.

R6.0  Full seed - Seeds touch and fill the pod cavity at one of the upper 4 main stem nodes with a fully developed leaf
End of leaf dry weight and nutrient accumulation
Lower leaf senescence begins
Pod abortion is now less likely. Stress reduces seed size
The R6 stage averages 18 days (9-30)

R6.5  Pod and pod wall beginning to turn mature color (yellow pod)
Root growth ceases,
Seed dry matter accumulation slows
Leaf yellowing begins
80 % seed dry matter accumulated
Stress will have a minimal effect on seed size

R7.0  Beginning maturity- Any pod on the plant has a mature color.
Physiological maturity
Yield is fixed
Stress will have no effect on yield
The R7 stage averages 9 days (7-18)

R8.0  Full maturity – 95% of pods contain mature seed
Finally! Harvest in 7-10 drying days
Late season soybean aphid scouting tips

The economic threshold is 250 aphids /plant, 80% of the plants with aphids present, aphid populations increasing and soybeans are less than R6. Yield loss occurs well after 250 aphids / plant. University entomologists across the Midwest are confident that this threshold minimizes yield loss and maximizes grower profitability. Numerous researchers and data sets have validated this threshold.

The 40 aphids/plant used by the “speed scouting” method sometimes causes confusion. It is used as a measurement of percentage infestation and is not an economic threshold. When aphids are spread through the canopy it is likely just as quick to estimate numbers of aphids / plant.

Scout efficiently
Aphids are small. Get scouting help if you have vision problems. Take dew and recent rainfall into account as water droplets on the leaves make scouting difficult.

Do not try to count each and every aphid. Count enough leaves and plants to get a feel for what 25, 50, 100, & etc. aphids look like. Estimating and counting by groups of 10 or 20 is fine and saves time. With a little experience you can learn to quickly estimate the number of aphids on a plant.

Look for aphids on the whole plant.
Do not just check the tops of the plants. New leaves can be still found on branches in the lower canopy during the early R5 stage. Aphids will be found scattered through the canopy and can be concentrated on lower leaves during the late R5 –R6 soybean stage. Aphids are tracking nutrients in the soybean phloem.

250 aphids do not look like much when they are spread through a larger soybean canopy.

Count live aphids
You are likely to see a small, pale form of soybean aphid on lower leaves during the R5 stage. Count them the same as aphids you have been seeing early in the season. As soybeans mature, these “white dwarves” can reproduce rapidly and can produce "normal", yellow green nymphs.

Do not count cast skins or shriveled and discolored dead aphids. Large numbers of dead aphids are an indication that the population may not be increasing.
After mid-August aphids may begin to move to buckthorn. The timing of this is quite variable and seems to depend on cool temperatures. Look for wing pads on the nymphs.

Shaking the plant will remove some water droplets and many of the dead aphids, making counting easier.

**Prioritize your efforts**
Under ideal conditions, aphid populations can double in 2-3 days. They can decline even faster. However, you may not need to scout every field every week. Prioritize the fields you check for your scouting efforts.

You have some time to get things done. A field averaging 10 aphids / plant today will not reach economic threshold for at least 10 days. The movement of winged aphids between fields should be slowing down making estimating population increases easier.

Fields planted early and those planted to an early maturity variety will be safe from aphid yield loss first.

Later planted fields and replanted areas are more attractive to any winged aphids moving between and within fields in August. Be realistic about very late planted soybean maturity and yield when making treatment decisions.

Plan ahead and scout based on when you project a field to near threshold. Fields on a longer waiting list for spraying should be checked before treatment to determine if aphids are still a problem.

**Do not give up on aphids too early.**
Aphid treatments should be based on aphid populations and soybean stage, not the calendar.

Scout and use the economic threshold into R5 soybeans. While the chances of an economic return for treating a 250 aphid/plant population decline as soybeans advance in maturity, very high aphid populations can cause small seed size and yield losses into R6. Drought or nutrient stress may increase the chance for R6 loss.

As the season progresses, insecticide pre-harvest interval (PHI) will become important.

The concept of economic injury level and cumulative aphid days can help determine if you can expect much yield loss. Even under stressful conditions, it takes more than 4000 cumulative aphid days to create detectable yield loss. 100 soybean aphids / plant would need to be present for 40 days and 200 soybean aphids / plant would need to be present for 20 days to accumulate 4000 aphid days. Good growing conditions and older plants are less sensitive to aphid pressure but it is very possible to see R6 populations of 10,000 aphids / plant.
Walk away from soybean fields where leaves begin to yellow or any yellow pods are found. This would be the R6.5 stage of soybeans.

**Check your work**
Residual control should not be expected from any insecticide applied to soybeans still putting on new leaves at the top of the plant. These leaves can be colonized by winged aphids moving into the field.

Make sure insecticide applications performed well. Aphids that are dead in the upper canopy and alive in the lower canopy indicate poor spray coverage. Live soybean aphids and dead beneficial insects and could indicate an insecticide resistant population.

Fields with early (before August) insecticide applications may be re-colonized by winged aphids and need re-treatment. These re-infestations may hit economic threshold after most other fields in the area are safe from aphid yield loss.

From the IPM Stuff 2013-11 July 23:
*As usual, the winged aphids are going to help decide late–season 2013 aphid populations in Minnesota. We may start to see more widespread threshold populations in ten days or so, probably after August 11.*

*The large number of later planted soybean could make late August aphid scouting more exciting than typical.*

Things seem to be on schedule. For those of you that have learned to gauge aphid populations based on phenological correlations, the 2013 Sturgis Motorcycle rally concludes August 11th.

Happy trails,

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