

Recognizing Potential Cotton Pest Problems In A Multi-Crop Environment

Dr. B. Rogers Leonard

Professor of Entomology, LSU AgCenter

Jack Hamilton

Regents Chair in Cotton Production, LSU AgCenter

Introduction

The recent increase in grain prices has motivated many producers to broaden their cropping systems to include combinations of wheat, field corn, soybean, grain sorghum, and cotton. Many southern arthropod pests infest more than one of these plant hosts and crop diversification has the potential to increase overall pest pressure and influence the costs of plant production strategies. This report will briefly illustrate examples of pests that may be influenced by crop diversity on individual farms and in local areas. In addition, several suggestions for common sense management tactics will be discussed.

Arthropod (Insects and Spider Mites) Pests and Cropping System Interactions

In many cases, the initial infestations of cotton pests do not occur across the entire field and are discovered as localized problems in specific areas. Usually these areas are associated with field borders and may be adjacent to a number of landscapes such as crops, fallow fields, pastures, woodland, WRP-CRP fields, and wetlands. There is only one arthropod pest, boll weevil, which is specific to cotton and not found attacking other crops. Infestations of other pests in cotton fields usually originate from populations in other native host areas or crop fields and immigrate to cotton fields. This event usually occurs as the result of cotton plants becoming more attractive as hosts for those specific pests than those plants where the population first originated.

Examples of cotton arthropod pests that are found in other crops are common. Thrips often develop on native winter and spring grasses or grain crops such as wheat. As wheat plants mature, high numbers of thrips migrate into adjacent cotton fields and attack seedlings. Tarnished plant bugs are often found infesting native vegetation, field corn, soybeans, and even grain sorghum fields. As these crops become unfavorable hosts, populations can migrate to adjacent cotton fields for an extended period. The corn earworm or bollworm prefers corn plants during the silking stage of development. As corn plants mature beyond this stage of development, this pest moves into cotton fields that are usually are in their reproductive stages of plant development. The fall armyworm is a migratory pest that feeds on a wide range of native and crop hosts. During the late summer as those hosts mature and are no longer attractive, populations of fall armyworm often move into cotton fields and cause injury. Spider mites are active during the early spring on numerous plant hosts including corn and soybean which allows populations to increase. During favorable environmental conditions, spider mites can infest cotton fields during the early-, mid-, and late-season. The same complex of stink bugs that infests soybean also will feed on cotton. Many southern producers are producing MG IV soybeans that are harvested during August and early September. Late-season stink bugs problems have become common in many agroecosystems that include combinations of cotton and MG IV soybean. This brief list certainly does intend to include all possible arthropod pests that can be found in multi-crop environments, but should provide enough examples to justify the importance of the potential interactions and effects on cotton IPM strategies.

Considerations for Pest Management Tactics

Producers and scientists have recognized for many years that crop production practices and the local environment within and around cotton fields can have significant effects on the development of pest problems, and require an adjustment in pest management strategies. More costly pest problems do not always occur in each and every instance, but producers and agricultural consultants should be aware of the potential for these effects, and be prepared to modify their pest control tactics. Several suggestions for managing cotton pests in fields associated with multi-crop landscapes are listed below.

- Establish field plans for crops well-in-advance of planting after considering the implications of emigrating pests. Provide this

information to your agricultural consultant for review and obtain his suggestions to minimize pest problems.

- Producers should attempt to plant the same crop across an entire field or in groups of fields. This strategy will minimize the number and length of border areas between cotton fields and other crops that may provide a source of emigrating arthropod pests.

- Effective control of late-winter and early-spring vegetation across all fields on a farm can reduce overwintering pest populations before the crop is planted. Producers should use tillage or herbicide combinations to completely destroy all weeds in fields. Well-timed herbicide use strategies can reduce alternate host availability, suppress pest population development, or delay emigration into adjacent cotton fields.

- If a pest problem is identified in an adjacent field, increase the frequency of scouting cotton fields along the border areas. Early detection of pests and the timely application of the appropriate control tactics can be important to reduce the overall seasonal injury potential and costs of pest management. Do not apply preventative treatments and use established action thresholds for applications of pesticides.

- Crops such as wheat and field corn are usually actively growing at the time cotton is being planted. Recognize the potential of thrips immigrating to adjacent cotton fields. Producers should consider using a soil insecticide such as Temik 15G or insecticide-treated seed to reduce the impact of thrips injury to cotton seedlings. As wheat matures, high numbers of thrips may migrate to adjacent cotton fields. If this immigration occurs after the residual efficacy of the insecticide has decayed, supplemental foliar insecticide applications may be necessary.

- If pest populations are detected in localized areas along cotton field borders, apply pesticide treatments only to those areas of fields where infestations are located, especially during the early to mid-season. Treating only isolated portions of fields reduces control costs without sacrificing yields.

- During the mid-to-late season, producers and agricultural consultants should monitor all crops on a farm. Allowing pest populations to increase in one crop, even if that crop is already mature and no economic injury is occurring, can provide a source of infestation to adjacent fields. Usually late-season emigrating populations are very heavy and may persist for an extended period. This may result in multiple pesticide applications at frequent intervals.

- Be aware of differences in pesticide labels among different crops. Although the same pest may infest and injure several crops, pesticides are not universally labeled across all crops. Using non-labeled pesticides is illegal and could cause crop phytotoxicity and yield loss to occur.

- Destroy all post-harvest crop residue and weedy vegetation to eliminate overwintering quarters for pests and subsequently build populations during the fall.

- Double-cropping cotton after winter wheat should be given special consideration due to the delay in planting, crop development, and eventual harvest. The double-cropped fields remain attractive to arthropod pests after most other local cotton fields have reached harvest maturity. An "island" effect is created in which many of the pests in that area funnel into the attractive double-cropped fields. In some instances, persistent and high populations can occur and require numerous and costly pesticide applications to obtain satisfactory control. The same concerns also exist for any late-planted cotton fields.

Summary

Southern agriculture will continue to evolve with annual fluctuations in the value of all available crops. Successful producers will capitalize on the profitability and stability of multi-cropping systems. This change to multi-crop production systems will also influence the diversity and severity of arthropod pest problems. A "common-sense" approach to pest management strategies is necessary to optimize farm income from cotton, as well as other crops. Agricultural consultants and producers are forewarned to recognize the direct relationships of cotton pest problems and specific plant hosts in multi-crop production systems and to adjust their pest control tactics accordingly. Δ