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Title: Integrated management of tomato spotted wilt, leaf spot rust, white mold, and CBR in peanut

Peanut plant pathology and nematology field trials are being conducted in 2016 at the Brewton Agricultural Research Unit (1), Gulf Coast Research and Extension Center [GCREC] (8), Plant Breeding Unit [PBU] (2), and Wiregrass Research and Extension Center [WREC] (14). In addition, trials assessing the efficacy of thrips control treatments on thrips populations, TSW incidence, and peanut yield are being conducted at the Wiregrass Research and Extension Center (2).

The efficacy of seed and in-furrow treatments, and early post insecticide treatments as influenced by planting date for the control of thrips feeding injury as well as on the incidence of tomato spotted wilt (TSW) and white mold, leaf spot defoliation, seedling populations, and yield response of a TSW susceptible and resistant peanut variety in an irrigated production system were compared at WGREC in 2016. Insecticide programs greatly differed in the level of protection from thrips feeding damage on both peanut varieties with Thimet 20G along or fb Orthene 97S early post providing superior protection compared with the other programs. The high level of thrips protection was particularly evident in the 1st DOP on both varieties. Over multiple rating dates, Velum Total consistently matched the high level of thrips protection obtained with Thimet at the 2nd but not 1st DOP. A reduction in thrips feeding damage was obtained with the two but not the one application Orthene 97S program and CruiserMaxx was ineffective at the 1st and to a lesser extent 2nd DOP. So, Thimet 20G proved the most efficacious insecticide, particularly in the 1st planting for protecting peanut from thrips feed damage. Despite sizable differences in thrips damage, both varieties largely recovered within two weeks and no differences in yields were observed among insecticide programs. While damage levels for all three diseases was low, planting date impacted TSW and white mold incidence along with leaf spot defoliation in peanut. Results confirm those of previous studies that TSW and white mold incidence is higher in early than later planted peanuts as well as the increase in defoliation in later compared with April-planted peanuts. Similar yields were also noted between the 1st and 2nd DOP. Peanut varieties differed in thrips damage levels, TSW and white mold incidence along with leaf spot defoliation and yield. Georgia-06G suffered less thrips damage, TSW and white mold incidence and leaf spot defoliation than Flavorunner 458 but produced greater pod yield compared with the latter peanut variety. Overall, Thimet 20G gave the best thrips protection and proved particularly effective in early-planted peanuts but did reduce seedling plant populations, which may have accounted for the absence of a significant yield gain with this insecticide.

The efficacy of nematicides as influence by peanut variety was assessed at the WGREC. While reductions in root knot damage to the pods and roots along with peanut root-knot reproductive index were observed with both root knot resistant varieties when compared with the root-knot susceptible Georgia-06G, yield for Georgia-14N were considerably higher than Tifguard as well as the latter susceptible cultivar. Overall, the performance of Georgia-14N was far superior here to results obtained in other variety trials conducted at the Wiregrass Research and Extension Center. Georgia-14N also suffered less white mold damage than either of the other two varieties screened. Significant yield gains as well as improved seedling vigor were obtained with Velum Total but not AgLogic aldicarb when compared with the non-treated control. To be fair, the application rate for AgLogic aldicarb was well below that recommended for the control of root knot nematode in peanut, which will be used in all future nematicide trials. Absence of a significant variety × nematicide interaction suggests that yield gains were obtained across all varieties with Velum Total. Due to low leaf spot and white mold pressure, Velum Total failed to reduce the level of damage attributed to either disease nor did this nematicide or AgLogic reduce the pod and root damage or rate of peanut root-knot nematode reproduction.

The impact of seeding rate on plant populations, occurrence of tomato spotted wilt (TSW), leaf spot, white mold, as well as the yield of selected commercial peanut cultivars was evaluated in a dryland production system at WGREC. Planting date and variety selection but not seeding rate significant impacted leaf spot-incited defoliation, white mold incidence, and pod yield, while TSW incidence was influenced by planting date, variety, and seeding rate. As noted in the results, TSW, leaf spot, and white mold activity was low and none of these diseases significantly impacted yield. Georgia-12Y proved again to have superior TSW and white mold resistance, while Georgia-09B had greater ratings for all three diseases. The absence of a yield response to declining seeding rates illustrates that peanut can compensate for reduced seedling plant populations even in a rainfed production system without jeopardizing yield. Cutting seed rates to 3 seed per foot, particularly for April-planted peanuts, increases the risk of yield losses under cooler and wetter weather patterns, which favors stand losses due to seed rot and seedling disease. However, results suggest that seeding rates may be reduced below the recommended 6 seed per foot without sacrificing yield.

Yield and reaction of advanced runner and Virginia market type breeding lines along with commercial varieties to TSW, leaf spot, white mold were compared in an irrigated production system at WGREC. The runner breeding lines AU NPL 17, GA 122706, GA 122707, GA 122708, and UF 08036 either matched or exceeded the disease package and yield response of the current runner commercial standard, Georgia-06G. Currently, there is an ongoing seed increase for AU NPL 17 and small quantities of registered seed should be available in 2018. The runner breeding lines UF 07025 and UF 15303 have elevated TSW indices, which may limit their value where this disease is endemic in peanut and vegetable crops. Several of the Virginia breeding lines also displayed a good TSW resistance and yields comparable to the Bailey commercial standard. In the PVT trial, high yields and relatively low TSW incidence and leaf spot defoliation makes Georgia-06G a hard variety to beat in Southeast Alabama. Of the varieties that matched the yield of Georgia-06G, TUFRunner 297 displayed excellent yield potential but disease ratings for TSW were higher than anticipated. While Georgia-13M and TUFRunner 511 both have leaf spot issues but yielded well, both of these varieties will likely be replaced by more disease resistant varieties. The newly released AU NPL 17 combined excellent TSW and leaf spot resistant with high yield potential. For the dryland PVT study, yields of the high oleic varieties AU NPL 17 and TUFRunner 297 matched those of the current industry standard Georgia-06G. All of the above varieties including Georgia-12Y and Georgia-13M showed good TSW resistance, while FloRun 157, TUFRunner 511, and TUFRunner 297 had very elevated TSW counts and with the exception of TUFRunner 511 lower yields.

Yields and level of leaf spot and white mold control obtained with a standard and an intensive fungicide program on selected commercial peanut varieties was evaluated at the WGREC. With the exception of leaf spot control on several varieties, the level of disease control provided by the standard 'chlorothalonil only' and intensive fungicide programs did not greatly differ but higher yields were obtained for the latter than former program. The newly released AU NPL 17 matched and often exceeded the yield response of peanut varieties released by UGA and UF. Other high yielding varieties included Georgia-06G, TUFRunner 297 and TUFRunner 511.

The yield response as well as the level of leaf spot and white mold control obtained with recommended fungicide programs on two commercial peanut varieties were compared at the WGREC. With the exception of Echo/Abound + Echo, significant reductions in white mold incidence obtained with Echo/Provost Opti, Priaxor/Muscle ADV/Priaxor/Echo, Echo/Fontelis, and Alto + Echo/Echo/Elatus programs were linked with higher yields with the latter program producing the highest yields. Greater yields were obtained with Georgia-06G than Georgia-09B.

Yields as well as level of leaf spot and white mold control obtained with a standard and high input fungicide program on selected commercial peanut cultivars at the GCREC. Overall, the intensive fungicide program provided better late leaf spot control but failed, despite significantly greater product costs, increase yield across 13 peanut varieties. Pressure from TSW was minimal. Greatest yields were recorded for Georgia-12Y and TUFRunner 297 along with TUFRunner 727, FloRun 157, and Georgia-06G.

Efficacy of fungicides for the control of foliar and soil diseases on peanut as well as yield response was compared on Georgia-06G and TUFRunner 511 at the GCREC. While late leaf spot defoliation was higher in TUFRunner 511 than Georgia-06G, white mold incidence and yields were similar for both varieties. Significant differences in late leaf spot defoliation attributed to late leaf spot or white mold incidence were not observed between fungicide programs. Yield for the Echo/Provost Opti program were greater compared with the Echo/Convoy + Echo, Echo/Artisan + Echo, Echo/Muscle ADV, Echo/Abound + Alto programs, all of which all had similarly lower yields. Low yields reported for the Echo/Artisan + Echo program were also matched by the Echo/Fontelis and Also + Echo/Echo/Elatus programs.

Publications

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Abstracts of Papers

Campbell, H. L., A. K. Hagan, K. L. Bowen, L. Wells, M. Pegues, and J. Jones. 2017. Disease occurrence and yield response of selected peanut cultivars as impacted by fungicide inputs at two locations. Am. Pnut. Res. Ed. Soc. 48: (accepted).

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