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ARTICLE

# Effect of Spray Adjuvant and Prohexadione Calcium Formulation on Peanut (*Arachis hypogaea* L.) Productivity

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ABSTRACT

Prohexadione calcium (calcium 3-oxido-5-oxo-4-propionylcyclohex-3-enecarboxylate) is used to manage excessive vegetative growth in peanut (*Arachis hypogaea* L.). This practice has traditionally been more widespread in Virginia market-type cultivars that generally have more vigorous canopy growth. However, the use of this active ingredient in runner peanut cultivation continues to increase. Prohexadione calcium was initially formulated as a water dispersible granule (WDG) and a new oil dispersion (OD) formulation has been introduced. Limited information is available regarding optimal adjuvants and application rates for the OD formulation of prohexadione calcium. This study aims to assess the efficacy of the new OD formulation of prohexadione calcium on pod yield, grade and economic return. Six experiments were conducted across locations in Mississippi and Georgia in 2022. The findings indicate that the OD formulation yields similar effects in managing excessive vine growth when using either crop oil concentrate or non-ionic surfactant adjuvants, thereby resulting in comparable yield, grade, and economic return to that of the WDG formulation. Moreover, prohexadione calcium exhibits the capacity to suppress excessive vegetative growth and enhance pod yield at reduced application rates, specifically at105 g ai/ha. This reduction in application rate, coupled with the improvement in yield, translated into a higher return on investment, ranging from 30 to 400 U.S. dollars per hectare, across three out of four experimental sites when compared to the non-treated control. These results suggest that profitability could be increased by applying prohexadione calcium on runner peanuts if excessive vine growth occurs.

## INTRODUCTION

Prohexadione calcium (calcium 3-oxido-5-oxo-4-propionylcyclohex-3-enecarboxylate) is used as a plant growth regulator to suppress excessive vegetative growth. It competes with 2-oxoglutarate – the co-substrate of dioxygenases and inhibits the formation of gibberellin (Rademacher, 2000). Higher plants, including cereal crops, rice (*Oryza sativa* L.), oilseeds (*Vitis vinifera* L.), turfgrass, and fruit trees react to prohexadione calcium application with reduced shoot growth (Rademacher, 2000). The application of prohexadione calcium has been a longstanding practice on virginia market-type peanut cultivars due to their vegetative growth exceeding the need for maximum pod yield (Phipps, 1995; Faircloth *et al.*, 2005; Jordan *et al.*, 2008), especially under favorable environmental conditions. Recently, the adoption of this practice has extended to runner market-type cultivars. This shift is attributed to the introduction of cultivars with increased vegetative growth, aimed at enhancing overall yield (Monfort *et al.*, 2021). Consequently, there is a demand for strategies to effectively manage the excessive vine growth of runner market type cultivars to improve harvest efficiency.

Prohexadione calcium was initially formulated as a water dispersible granule (Kudos® WDG). More recently, a new oil dispersion (Kudos® OD) formulation has been introduced for use in peanut (Warren 2023). Adjuvants applied with foliar-applied chemicals can increase their absorption and effectiveness (Hazen, 2000). Crop oil concentrate (COC) or non-ionic surfactant (NIS) is commercially recommended as an adjuvant with the traditional WDG prohexadione calcium formulation. The addition of ammonium sulfate (AMS) is also recommended as a water conditioner when applying prohexadione calcium (Rademacher and Kober, 2003; Osterholz *et al.*, 2018). However, information is limited on adjuvant combinations and optimal application rates for the OD formulation of prohexadione calcium.

Previous research examining applications of prohexadione calcium to runner market types at rates of 70, 105, and 140 g ai/ha suppressed excessive vine growth, but the yield improvements associated with the vine growth reduction did not always occur (Studstill *et al.*, 2020; Treadway, 2020; Monfort *et al.*, 2021). It was hypothesized that a new oil-based formulation could improve the efficacy of the application. However, an oil-based formulation with COC as an adjuvant also has the potential to increase phytotoxicity. Therefore, field trials were conducted to quantify the efficacy of different OD prohexadione calcium application rates and adjuvant combinations on peanut growth, yield, grade and economic return.

## MATERIALS AND METHODS

The primary experiment (Table 1, experiment 1) was conducted on-farm at Amory (33° 59’ 3.4” N, 88° 29’ 17.2” W) and Carlisle (32° 00’ 9.6” N, 90° 5’ 4.4”) Mississippi (MS), and on Hillside Farms in Early County (31°22'52.92"N, 84°38'53.15"W) Georgia (GA) in 2022. Experimental treatments consisted of a non-treated control, oil dispersible (Kudos® OD, Fine Americas Inc., Walnut Creek, CA) formulation plus crop oil concentrate (COC, Crossfire®, Triangle Chemical Company, Macon, GA), Kudos® OD formulation plus a nonionic surfactant (NIS, D-W Surfactant®, Triangle Chemical Company, Macon, GA), and water dispersible granule (Kudos® WDG) formulation plus COC (Table 1). Additional experiments (experiment 2, Table 1) were also conducted in Tift County in 2022, GA (31°24'27.70"N, 83°37'36.38"W) on Docia farms (Docia 1 and Docia 2). Compared to experiment 1, the non-treated control was replaced by the Kudos® WDG plus a NIS treatment which served as the positive control (Table 1), and all the other treatments remained the same. Experiment 3 (Table 1), conducted at Stoneville, MS (33° 25’ 26.4” N, 90° 54’ 54.4”) in 2022, contained five treatment levels consisting of combinations of two formulations (Kudos® OD and WDG) and two adjuvants (NIS and COC), plus a non-treated control. Main stem height from ground level to highest apical meristem was measured at Early County, GA and both locations at Tift County, GA to examine treatment effects on peanut vegetative growth in each experiment. Measurements were taken four times during the growing season on representative plants in each plot. The initial measurement was taken 1 day prior to the first application of prohexadione calcium and repeated every two weeks.

**Table 1. Prohexadione calcium (Ca) formulation, application rate, adjuvant and ammonium sulfate addition of treatments were applied to experiments in this study.**

| Prohexadione Ca formulation[1] | Prohexadione Ca rate (g ai/ha) | Adjuvant[2] | AMS[3] |
|---|---|---|---|
| | Experiment 1: Amory, Carlisle (MS) and Early County (GA) in 2022 | | |
| Non-treated | 0 | - | - |
| OD | 105 | COC | + |
| OD | 105 | NIS | + |
| WDG | 105 | COC | + |
| | Experiment 2: Tift County (GA) in 2022 | | |
| OD | 105 | COC | + |
| OD | 105 | NIS | + |
| WDG | 105 | COC | + |
| WDG | 105 | NIS | + |
| | Experiment 3: Stoneville (MS) in 2022 | | |
| Non-treated | 0 | - | - |
| OD | 140 | NIS | + |
| WDG | 140 | NIS | + |
| OD | 140 | COC | + |
| WDG | 140 | COC | + |

[1] Water dispersible granule (WDG) and oil dispersion (OD) are formulated and sold by Fine-Americas Inc. under the trade name of Kudos®.
[2] Crop oil concentrate= COC (Crossfire®, Triangle Chemical Co.) and nonionic surfactant =NIS (D-W Surfactant®, Triangle Chemical Co.).
[3] Ammonium sulfate =AMS (Linedrive®, Triangle Chemical Co.), “+” refers to the AMS was added and “-” refers to the AMS was not added.

Cultivar Georgia-06G (Branch, 2007) was planted at all locations in Mississippi and at the Early County location in Georgia at a seeding rate of 23 to 26 seeds $m^{-1}$. Cultivar Georgia-12Y (Branch 2013) was planted at all other locations in Georgia at a seeding rate of 26 seeds $m^{-1}$. Planting dates for the research trials ranged from early to mid-May (Table 2). Mississippi locations had a tank mixture of Bradyrhizobia (0.51 L/ha; Primo Power CL, Verdesian Life Sciences, Cary, NC), azoxystrobin (0.21 kg ai/ha; Abound®, Syngenta, Greensboro, NC) and imidacloprid (0.36 kg ai/ha; Admire® Pro, Bayer Crop Science, St. Louis, MO) applied in-furrow at planting. Georgia locations had a tank-mixture of Bradyrhizobia (0.51 L/ha; Primo Power CL, Verdesian Life Sciences, Cary, NC) and Phorate (1.12 kg ai/ha; Thimet® 20-G; AMVAC Chemical Corporation, Los Angeles, CA) applied in-furrow at planting. The two on-farm locations (Amory and Carlisle) in Mississippi were planted on a 0.96 m twin-row pattern, and the Stoneville, MS location was planted on a 1.0 m single-row pattern. All locations in Georgia were planted on a 0.91 m twin-row pattern. Weeds and diseases were managed across the entire test area with labeled pre- and post-emergence herbicides and fungicides based on local recommendations. Research sites in Mississippi were dryland, and sites in Georgia were irrigated based on the grower's schedule.

**Table 2. Location, state, year, planting date, prohexadione calcium application timings, digging dates, and harvest dates that were used in the three experiments of this study.**

| | | | | | Dates | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Prohexadione Ca application | | Harvest | |
| Exp | Location | State | Year | Planting date | First | Second | Inverting | Combining |
| 1 | Amory | Mississippi | 2022 | 06 May | 21 Jul | 08 Aug | 26 Sep | 03 Oct |
| 1 | Carlisle | Mississippi | 2022 | 05 May | 08 Jul | 27 Jul | 13 Oct | 18 Oct |
| 1 | Early | Georgia | 2022 | 01 May | 06 Jul | 20 Jul | 27 Sep | 30 Sep |
| 2 | Tift | Georgia | 2022 | 03 May | 06 Jul | 21 Jul | 10 Oct | 17 Oct |
| 3 | Stoneville | Mississippi | 2022 | 17 May | 28 Jul | 15 Aug | 07 Oct | 13 Oct |

The experimental design at all research sites was a randomized complete block (RCBD) with three or four replications. The prohexadione calcium treatments were applied at a rate of 105 g ai/ha at research sites for experiment 1 and experiment 2. In experiment 3, the Stoneville location had a prohexadione calcium application rate of 140 g ai/ha with Kudos® OD or WDG formulation plus an NIS or COC adjuvant (Table 1). Ammonium sulfate (Linedrive®, Triangle Chemical Company, Macon, GA) was added to the spray tank at 1.12 kg ai/ha prior to mixing prohexadione calcium and adjuvants for all treatment applications. The COC and NIS adjuvants were applied at 1% and 0.25% v/v respectively. All treatment applications were applied at a spray carrier volume of 140 L/ha using flat fan nozzles (TeeJet Technologies, Glendale Heights, IL). Treatment application timings were standardized across all locations with the first application time occurring at 50% of the lateral vines touching in the row middle and the second application occurring 2-3 weeks after the first application as recommended by the product label (Table 2).

Plants were machine dug and vines inverted using either a two- or six-row digger (Kelley Manufacturing Company, Tifton, GA) at optimal maturity determined by the maturity profile method (Williams and Drexler, 1981; Song et al., 2021, Song et al., 2022) for each cultivar at all locations. Digging times occurred at 143, 161, and 143 days after planting (DAP) at the Amory, Carlisle, and Stoneville locations, respectively. Digging dates for the Georgia locations were 146 DAP for Early County and 160 DAP for Tift County. Inverted plants were left in the open air for 4-7 days for initial dehydration, and then pods were machine-harvested. Plot weights were determined using a custom peanut dump cart equipped with load cells (Shortline Manufacturing, Shaw, MS) at all Mississippi locations and a custom peanut dump cart equipped with load cells made by Peerless Manufacturing in Shellman, GA was used for the trials in Georgia. Peanut subsamples (500g) were collected from each plot for pod moisture (500 g) and grade [-total sound mature kernels (TSMK)] determination. Pod yields were adjusted to 10% kernel moisture at all locations.

Statistical analysis was performed using SAS v. 9.4 statistical software (SAS Institute, 2013). PROC GLIMMIX was used to compute analysis of variance (ANOVA). For each experiment (Table 1), the prohexadione calcium formulation and adjuvant type were treated as fixed effects, and the block was included in the model as a random effect. Normality and homogeneity were visually assessed by graphing the residual distribution, scatter plot of residuals, and Q-Q plot of residuals. Appropriate means were separated using Fisher's Protected Least Significant Difference (LSD) at P = 0.05 as specified in each figure or table.

## RESULTS AND DISCUSSION

Compared to non-treated peanut, prohexadione calcium resulted in a lower mainstem height by 25% when averaged across the season (Figure 1). Notably, the OD formulation with a COC adjuvant had a shorter mainstem height than the same formulation with a NIS adjuvant at 89 DAP after the second application (Figure 1). This indicates that the COC adjuvant plus OD formulation has greater efficacy (Figure 1). At Docia 1 and Docia 2 in Tift County, the COC adjuvant also made the WDG formulation more efficient when compared to the NIS adjuvant at 107 DAP after the second application, but no differences were observed between OD formulations with COC and NIS adjuvant (Figure 2).

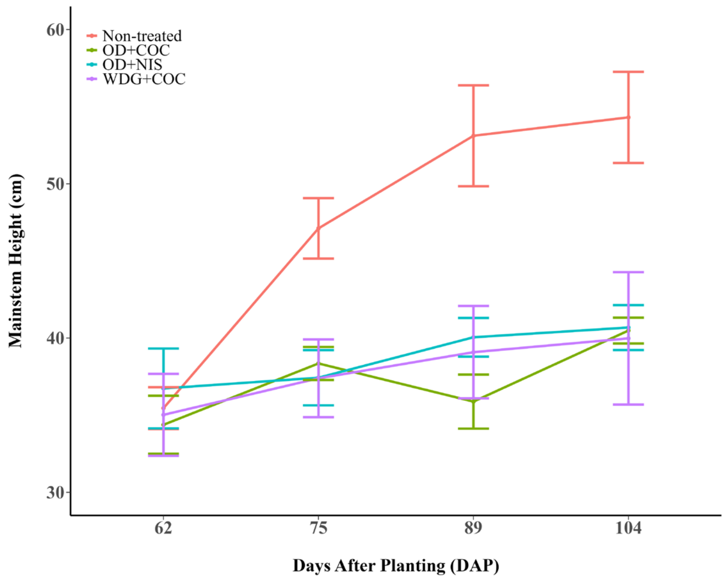


**Figure 1. Plant mainstem heights in response to spray adjuvant and prohexadione calcium formulation applied at a rate of 105 g ai/ha in Early County, GA. Water dispersible granule (WDG) and oil dispersion (OD) are formulated and sold by Fine-Americas Inc. under the trade name of Kudos®. Crop oil concentrate (COC, Crossfire®, Triangle Chemical Co.) and nonionic surfactant (NIS, D-W Surfactant®, Triangle Chemical Co.) were the spray adjuvants tested in this experiment. The data point is expressed as the means with the standard error.**

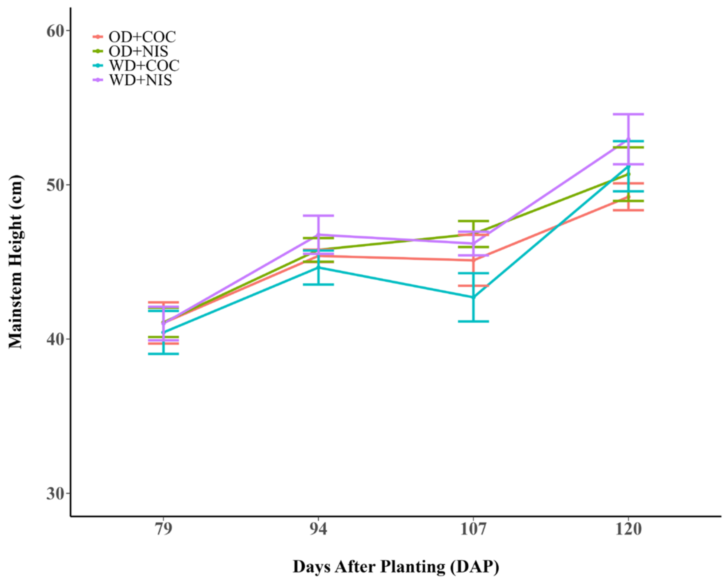


**Figure 2. Plant mainstem heights in response to spray adjuvant and prohexadione calcium formulation applied at a rate of 105 g ai/ha at Docia 1 and Docia 2 farms in Tift County, GA. Water dispersible granule (WDG) and oil dispersion (OD) are formulated and sold by Fine-Americas Inc. under the trade name of Kudos®. Crop oil concentrate (COC, Crossfire®, Triangle Chemical Co.) and nonionic surfactant (NIS, D-W Surfactant®, Triangle Chemical Co.) were the spray adjuvants tested in this experiment. The data point is expressed as the mean with the standard error.**

Prohexadione calcium formulation with either COC or NIS resulted in greater yield at two of three on-farm locations (Table 3). At the Carlisle and Early County locations, all prohexadione calcium treatments increased pod yield when compared to the non-treated control (Table 3). No pod yield differences were observed between the WDG and OD formulations with COC or NIS adjuvants indicating that OD formulation has comparable effects to the traditional WDG formulation. Additionally, no differences in pod yield were observed between non-treated and treated plants at the Amory location, probably due to slow vine growth caused by the limited precipitation received after application. The differences in net revenue aredriven by yield, but the difference between prohexadione calcium applications and non-treated control in net revenue is not seen at the Early County location mainly because the non-treated control has greater (not significant) TSMK.

Table 3. Effects of prohexadione calcium (Ca) applied twice at 105 g ai/ha in three on-farm experiments on runner-type peanut cultivars at Amory and Carlisle, Mississippi, and Early County, Georgia, in 2022.

| Location | Prohexadione Ca formulation[1] | Adjuvant[2] | Yield (kg/ha) | TSMK[3] (%) | Net revenue[4] (US$/ha) | Loan ROI[5] (US$/ha) | Ref ROI[6] (US$/ha) |
|---|---|---|---|---|---|---|---|
| Amory | Non-treated | - | 7178 a[7] | 73.3 a | 2796 a | 0 a | 0 a |
| | OD | COC | 7206 a | 73.1 a | 2699 b | -97 b | -77 b |
| | OD | NIS | 7036 a | 72.4 a | 2621 b | -174 b | -164 b |
| | WDG | COC | 7024 a | 72.3 a | 2599 b | -196 b | -185 b |
| Carlisle | Non-treated | - | 9706 b | 72.7 a | 3742 b | 0 b | 0 b |
| | OD | COC | 10643 a | 74.0 a | 4084 a | 341 a | 464 a |
| | OD | NIS | 1060 a | 73.5 a | 4055 a | 313 a | 454 a |
| | WDG | COC | 10750 a | 74.0 a | 4133 a | 390 a | 528 a |
| Early County | Non-treated | - | 7003 b | 69.7 a | 2485 a | 0 b | 0 c |
| | OD | COC | 7677 a | 66.0 a | 2513 a | 29 b | 337 b |
| | OD | NIS | 7983 a | 67.3 a | 2725 a | 240 a | 596 a |
| | WDG | COC | 7837 a | 65.7 a | 2509 a | 24 b | 352 b |

[1] Water dispersible granule (WDG) and oil dispersion (OD) are formulated and sold by Fine-Americas Inc. under the trade name of Kudos®.
[2] Crop oil concentrate= COC (Crossfire®, Triangle Chemical Co.) and nonionic surfactant =NIS (D-W Surfactant®, Triangle Chemical Co.).
[3] TSMK: % total of sound mature kernels.
[4] Net revenue = $4.812/0.907 × TSMK × yield/1000 - the cost of prohexadione calcium application.
[5] Loan ROI (Return on investment) = $4.812/0.907 × TSMK × (treatment pod yield - control pod yield)/1000 - the cost of prohexadione calcium application.
[6] Reference ROI = $540/0.907 × (treatment pod yield - control pod yield)/1000 - the cost of prohexadione calcium application.
[7] Means followed by the same letter within each column of parameters are not significantly different determined by the Fisher's Protected LSD test at P=0.05.

When comparing prohexadione calcium formulation and adjuvant combinations in experiment 2, the treatment effects varied between locations (Table 4). For example, at Docia 1, the OD prohexadione calcium application with an NIS resulted in a 6% higher yield compared to using a WDG formulation with COC. However, at Docia 2, the WDG formulation plus COC led to a 6.5%, 5.8%, and 13% higher yield, TSMK, and net revenue, respectively, when compared to using the OD formulation plus NIS. These location-dependent effects could be attributed to local climate variations that influence the rate of canopy growth.

Table 4. Effects of prohexadione calcium (Ca) applied twice at 105 g ai/ha in two on-farm locations on runner-type peanut cultivars at Docia Farms in Tift County, Georgia in 2022.

| Location | Prohexadione Ca formulation[1] | Adjuvant[2] | Yield (kg/ha) | TSMK[3] (%) | Net revenue[4] (US$/ha) |
|---|---|---|---|---|---|
| Docia 1 | OD | COC | 7328 abc[5] | 70.5 a | 2650 a |
| | OD | NIS | 7608 a | 68.3 b | 2676 a |
| | WDG | COC | 7179 bc | 69 ab | 2536 a |
| | WDG | NIS | 7583 ab | 70.5 a | 2756 a |
| Docia 2 | OD | COC | 7371 ab | 74.3 a | 2852 a |
| | OD | NIS | 7032 b | 68.7 b | 2488 b |
| | WDG | COC | 7488 a | 72.7 a | 2811 a |
| | WDG | NIS | 7315 ab | 71.7 ab | 2643 ab |

[1] Water dispersible granule (WDG) and oil dispersion (OD) are formulated and sold by Fine-Americas Inc. under the trade name of Kudos®.
[2] Crop oil concentrate= COC (Crossfire®, Triangle Chemical Co.) and nonionic surfactant =NIS (D-W Surfactant®, Triangle Chemical Co.).
[3] TSMK: % total of sound mature kernels.
[4] Net revenue = $4.812/0.907 × TSMK × yield/1000 - the cost of prohexadione calcium application.
[5] Means followed by the same letter within each column of parameters are not significantly different determined by the Fisher's Protected LSD test at P = 0.05.

Compared to non-treated control, the yield improvement associated with vine growth reduction occurred in all plots treated with prohexadione calcium at the Stoneville location (Table 5). All treated plots had a yield increase when compared to the non-treated control. However, only the OD formulation applied with NIS led to significantly higher net revenue (Table 5). This may be attributed to a higher TSMK of OD formulation with NIS. No other significant differences were observed between OD and WDG formulations when applied with either NIS or COC.

Table 5. Effects of different rates of prohexadione calcium (Ca) applied twice at 140 g ai/ha in an on-farm experiment on runner-type peanut cultivars at Stoneville, Mississippi in 2022.

| Prohexadione Ca formulation[1] | Adjuvant[2] | Yield (kg/ha) | TSMK[3] (%) | Net revenue[4] (US$/ha) | Loan ROI[5] (US$/ha) | Ref ROI[6] (US$/ha) |
|---|---|---|---|---|---|---|
| Non-treated | - | 5371 b[7] | 73.5 ab | 2094 b | 0 b | 0 b |
| OD | COC | 5891 a | 72.5 b | 2165 ab | 70 ab | 203 ab |
| OD | NIS | 6007 a | 74.3 a | 2265 a | 170 a | 278 a |
| WDG | COC | 5825 a | 73.8 ab | 2221 ab | 110 ab | 141 ab |
| WDG | NIS | 5903 a | 72.9 ab | 2182 ab | 88 ab | 217 ab |

[1] Water dispersible granule (WDG) and oil dispersion (OD) are formulated and sold by Fine-Americas Inc. under the trade name of Kudos®.
[2] Crop oil concentrate= COC (Crossfire®, Triangle Chemical Co.) and nonionic surfactant =NIS (D-W Surfactant®, Triangle Chemical Co.).
[3] TSMK: % total of sound mature kernels.
[4] Net revenue = $4.812/0.907 × TSMK × yield/1000 - the cost of prohexadione calcium application.
[5] Loan ROI (Return on investment) = $4.812/0.907 × TSMK × (treatment pod yield - control pod yield)/1000 - the cost of prohexadione calcium application.
[6] Reference ROI = $540/0.907 × (treatment pod yield - control pod yield)/1000 - the cost of prohexadione calcium application.
[7] Means followed by the same letter within each column of parameters are not significantly different determined by the Fisher's Protected LSD test at P = 0.05.

Return on investment (ROI) was used to assess the treatments at various locations (Table 3). When pooled over all locations, most of the plots treated with prohexadione calcium consistently had higher ROI compared to the control group when using loan value and reference price. This trend persisted when examining individual locations, such as Carlisle and Early County, where most of the prohexadione calcium-treated plots consistently exhibited higher ROI compared to the control group (Table 3). The OD formulation applied with NIS at 105 g ai/ha resulted in a higher ROI compared to other prohexadione calcium formulations and adjuvants at Early County (Table 3). Conversely, at Armory, the effects of prohexadione calcium on ROI were negligible, as control plots had higher ROI compared to those treated with prohexadione calcium. This could be primarily attributed to the absence of excessive vegetative growth at the Armory due to limited precipitation received after application, thereby limiting the impact of prohexadione calcium application on ROI. At Stoneville, The OD formulation applied with NIS exhibited higher ROI compared to the control group across loan value and reference price. This further supports the positive impact of prohexadione calcium application on profitability, particularly when optimized with appropriate adjuvants and application rates.

## CONCLUSIONS

This study examined the growth, pod yield, and economic returns for applying different prohexadione calcium formulations and adjuvants to runner market-type peanut cultivars. An additional study (Stoneville) evaluated these factors when prohexadione calcium was applied at a range of active ingredient amounts. Our findings revealed that prohexadione calcium could suppress excessive vegetative growth and improve pod yield at a reduced rate (105 g ai/ha) and align with previous research (Beasley *et al.*, 2004; Monfort *et al.*, 2021). Three site-years evaluating adjuvant combinations with two different prohexadione calcium formulations were conducted during the 2022 growing season. Pod yield increases from applying prohexadione calcium occurred at three of the four locations when compared to the non-treated control. In general, the OD formulation had a similar impact on pod yield as the WDG formulation. Additionally, most treatment combinations, including COC or NIS, had similar pod yield results for both of the prohexadione calcium formulations. These results indicate that including either adjuvant is acceptable when applying prohexadione calcium. When comparing the efficacy among different formulations and adjuvant combinations, Docia 1 and Docia 2 also exhibited a location-dependent effect on pod yield. For instance, the OD formulation with an NIS has the greatest yield at Docia 1 but the least yield at Docia 2. Additional studies are needed to determine if the efficacy of each formulation and adjuvant combination potentially depends on the in-season environmental conditions that influence canopy growth and growth stage when 50% of the lateral vines are touching in the row middle (labeled timing).

The use of growth regulators has been only recommended for peanut plants that have excessive vine growth (Monfort and Tubbs, 2021). In Experiment 1, the Amory location did not exhibit an increase in pod yield under prohexadione calcium application, while Carlisle and Early County did. This difference may be attributed to the delayed canopy growth at Amory. The first application occurring at 50% lateral vines touching in the row middle was applied at 64 DAP at the Carlisle and 66 DAP in Early County location as compared to 76 DAP at the Amory location. Additionally, precipitation was greater following prohexadione treatment applications at the Carlisle location contributing to greater canopy growth at digging. Studies have indicated pod yield response from prohexadione calcium application is often attributed to improved harvest efficiency when excessive vine growth occurs (Studstill *et al.*, 2020). Therefore, it is plausible the non-responsive dryland Amory location did not have excessive vine growth causing reduced harvest efficiency.

Overall, this multilocation research project in Mississippi and Georgia confirms that the application of prohexadione calcium at reduced rates of 105 g ai/ha significantly improved yield on runner peanut cultivars by managing excessive canopy growth. This reduction in rate and the increase in yield provided a higher return on investment 30 to 400 US dollars per hectare at 3 of 4 sites over the control plots, suggesting profitability could be increased by applying prohexadione calcium on runner peanut if excessive vine growth occurs. The efficacy of two adjuvants (NIS and COC) are not distinct, indicating these two adjuvants are likely acceptable for both formulations.

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