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ARTICLE

Evaluation of New Prohexadione Calcium Formulation on Vine Growth Suppression and Yield of Peanut (*Arachis hypogaea* L.) in Georgia

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ABSTRACT

Prohexadione calcium is a plant growth regulator used to reduce vegetative growth and increase pod yield in peanut (*Arachis hypogaea* L.). Although historically formulated as a water dispersible granule (WDG), a new oil dispersion formulation (OD) of prohexadione calcium was labelled for use in peanut in 2024. Large plot experiments were conducted in Tifton, Georgia in 2021 and 2022 to evaluate the effects of prohexadione calcium OD at multiple rates on peanut vine growth suppression, *Rhizoctonia solani* incidence, yield, and return on investment. Prohexadione calcium OD was applied on the cultivar Georgia-12Y at 140 g ai/ha, 105 g ai/ha, and 70 g ai/ha. Prohexadione calcium WDG was applied at the recommended rate of 105 g ai/ha, and a non-treated control was included for comparison. Initial applications were made when 50% of the lateral vines were touching in adjacent rows and again 14 days later. The OD formulation regardless of rate significantly reduced main stem height and internode length compared to the non-treated control. Following the second application, prohexadione calcium OD at 105 g ai/ha continued to suppress vegetative growth for an additional four weeks compared to the WDG formulation at 105 g ai/ha. *Rhizoctonia solani* incidence was 9 to 15% greater in the non-treated control than all prohexadione calcium treatments. Prohexadione calcium OD at 70 g ai/ha and prohexadione calcium WDG at 105 g ai/ha significantly increased yield by 594 to 595 kg/ha over the non-treated control. Due to environmental conditions throughout 2021 and 2022, prohexadione calcium regardless of rate or formulation did not significantly increase net revenue. Therefore, prohexadione calcium OD may have increased efficacy on reducing vine growth compared to prohexadione calcium WDG, while the labelled rate of prohexadione calcium OD at 140 g ai/ha may hinder yield potential similarly to the WDG formulation as seen in other studies.

INTRODUCTION

Prohexadione calcium (calcium 3-oxido-5-oxo-4-propionylcyclohex-3-enecarboxylate) has been used intermittently for over 25 years to manage excessive vine growth in peanut (*Arachis hypogaea* L.). Prohexadione calcium was first registered for use in peanut in 2000 as a water dispersible granule (WDG) by BASF Corporation (Giles-Parker, 2000), and by Fine-Americas, Inc. in 2015 (Smith, 2015) marketed as Apogee 27.5 WDG and Kudos 27.5 WDG, respectively. Prohexadione calcium was originally marketed for use on virginia market-type cultivars due to their more robust growth habit. Studies have shown the effectiveness of prohexadione calcium on virginia market-type cultivars to reduce vine growth, improve row visibility, and increase yield (Mitchem *et al.*, 1996; Culpepper *et al.*, 1997; Jordan *et al.*, 2001; Beam *et al.*, 2002).

Over the last decade, the need for managing vine growth on runner market-type cultivars has increased due to the resurgence of more robust cultivars such as Georgia-12Y (Monfort and Tubbs, 2021; Branch, 2013). Georgia-12Y is a high-yielding runner market-type peanut cultivar with resistance to *Tomato spotted wilt virus* (*Orthotospovirus*) (TSWV) and white mold (*Agroathelia rolfsii*) (Branch, 2013). Although this cultivar performs well across many environments, growers have been slow to adopt Georgia-12Y due to its excessive growth habit (Monfort *et al.* 2021). Dense vine growth also makes Georgia-12Y more susceptible to Rhizoctonia limb rot (*Rhizoctonia solani* Kühn). *Rhizoctonia solani* lesions commonly occur in the lower canopy where there is soil contact or physical damage inflicted from machinery in the field (Brenneman, 1996). Increased vine growth has been shown to alter canopy structure and create a wide flat-topped canopy. Wide flat-topped canopies incur greater disease risks due to reduced fungicide penetration and changes in canopy microclimate (Bauman and Norden, 1971; Henning *et al.*, 1982; Culpepper *et al.*, 1997). Furthermore, wide flat-topped canopies decrease row visibility and increase the susceptibility of vine damage by equipment later in the season (Wu and Santelmann, 1977).

Prohexadione calcium has become increasingly utilized on runner market-type cultivars following the evaluation of prohexadione calcium WDG at reduced rates. Studstill *et al.* (2020) reported the response of runner type cultivars to prohexadione calcium WDG at reduced rates of 105 g ai/ha (0.75x) and 70 g ai/ha (0.5x). Large plot trials conducted in Georgia showed significant reductions in main stem height and increased yields over the non-treated control by 453 to 731 kg/ha. Similar studies conducted in Georgia and Mississippi also showed reduced vegetative growth and increased yields with reduced rates of prohexadione calcium WDG (Treadway, 2020: Monfort *et al.*, 2021). Utilizing reduced rates of prohexadione calcium WDG on runner market-type cultivars additionally provided a more economical solution for growers, reducing growth regulator costs and increasing net revenue by $62.00/ha to $146.00/ha when reduced rates of prohexadione calcium at 70 g ai/ha to 105 g ai/ha were used. (Studstill *et al.*, 2020; Monfort and Tubbs, 2021).

Although prohexadione calcium has historically been sold as a WDG since its introduction in 2000, Fine-Americas released a new oil dispersion formulation (OD) of prohexadione calcium marketed as Kudos OD® in 2024. Prohexadione calcium was reformulated for use in peanut to increase efficacy, improve tank mixability, and allow easier handling. The objective of this study was to evaluate the efficacy of prohexadione calcium OD at multiple rates on vine growth suppression, *R. solani* incidence, yield, and economic return on runner market-type cultivars.

MATERIALS AND METHODS

Large plot experiments were conducted at two sites in Tift County (31° 25' 36.49" N, 83° 35' 51.21" W and 31° 24' 20.50" N, 83° 37' 36.44" W), Georgia during 2021 and 2022 on Tifton loamy sands (Fine-loamy, kaolinitic, thermic Plinthic Kandiudults) with 2 to 5% slopes. The cultivar Georgia-12Y was planted in early May (Table 1) each year in irrigated fields. Trials were planted using a twin row Monosem planter (Monosem Inc., Edwardsville, KS 66111) with inset rows 17.8 cm to the interior of the bed and outer rows spaced 92 cm apart. Seeding rates of 19.7 to 23.0 seed per m row were used to achieve a desired final stand of at least 13.1 plants per m of row for the two twin rows combined. Plot dimensions were 5.4 m (6 rows) wide with lengths ranging from 274 to 415 m long. Production management decisions were based on the University of Georgia Cooperative Extension Service recommendations and were uniform across experiments excluding prohexadione calcium applications (UGA Extension, 2022).

Table 1. Year, planting date, prohexadione calcium application timing[a], dig date, and harvest dates used in 2021 and 2022 across large plot field trials conducted in Tifton, GA.

		Prohexadione calcium appl.[b]			
Year	Planting Date	First	Second	Inversion Timing	Harvest Timing
2021	5 May	55 DAP	70 DAP	153 DAP	165 DAP
2022	11 May	65 DAP	79 DAP	152 DAP	159 DAP

[a]DAP = days after planting

[b]Prohexadione calcium applications were applied with 1.2 L/ha of ammonium sulfate and 2.34 L/ha of crop oil concentrate in a carrier volume of 140 L/ha.

Experimental treatments consisted of prohexadione calcium OD at the manufacturer's recommended use rate of 140 g ai/ha (1.0x) along with reduced rates of 105 g ai/ha (0.75x) and 70 g ai/ha (0.5x). Prohexadione calcium WDG was applied at the current recommended reduced rate for runner market-type cultivars in Georgia at 105 g ai/ha (0.75x), and a non-treated control was included for comparison. All prohexadione calcium treatments were applied with 1.2 L/ha of ammonium sulfate (Amaze Gold, 34% Ammonium sulfate, Loveland Products, Inc. Greeley, CO 80632-1286) and 2.3 L/ha of crop oil concentrate (Maximizer, 83% Paraffin based petroleum oil, Loveland Products, Inc. Greeley, CO 80632-1286) per label recommendations. All prohexadione calcium treatments were applied with 140 L/ha of water using a 6-row tractor mounted sprayer equipped with TeeJet TP8004 Flat Fan Spray Tip - 110° (TeeJet Technologies, Springfield, Illinois, 62703). All treatments were made independently from other pesticide applications. Initial treatments were applied when 50% of the lateral vines from adjacent rows were touching in the row middles approximately 60 to 70 d after planting (DAP). A second application was applied 14 to 21 d later. The experimental design was a randomized complete block with four replications per site.

Plant growth response to prohexadione calcium treatments was determined by main stem height, number of internodes, and internode length. Main stems were measured at random in three locations in the plot. Main stem height was measured from the cotyledons to the tip of the plant (tissue below the cotyledons was excluded). Internode length was calculated by dividing the main stem height by the number of internodes on each main stem. Main stem measurements were taken at four intervals spaced 2 wk apart to assess growth response over time. The first sample date (SD1) was at 55 to 65 DAP (prior to the first application), SD2 at 70 to 79 DAP (prior to the second application), SD3 at 85 to 94 DAP (2 wk after the second application), and SD4 at 99 to 108 DAP (4 wk after the second application).

Peanuts were dug and inverted based on pod mesocarp color using the maturity profile board method (Williams and Drexler, 1981). Directly following inversion, *R. solani* incidence was measured within a randomly selected 18.3 m section of row in each plot. *Rhizoctonia solani* was assessed based on percent colonization of the fungus on the leaves, stems, roots, and pods of inverted plants from 0% colonization to 100% colonization. Plants were dried in windrows until pod moisture was reduced to 12 to 15%. Plots were harvested mechanically using commercial peanut combines. Pod yield was assessed at harvest and adjusted to 7% moisture. A subsample of pods from each plot was collected following harvest to assess market grade by the Georgia Federal State Inspection Service based on total sound mature kernels (%TSMK).

Return on investment was calculated using base loan value, yield (kg pods/ha), additional input costs ($/ha), and the cost of the prohexadione calcium applications ($/ha). Base loan value is established by the USDA each year and is $355/ton plus or minus any premiums or deductions in grade. Gross Revenue ($/ha) was calculated using the yield (kg/ha) of each treatment multiplied by the dollar value per metric ton. Net revenue ($/ha) was calculated by subtracting the cost of the prohexadione applications and additional pesticide costs from gross revenue.

Data was analyzed in SAS version 9.4 using the PROC GLIMMIX function (SAS 9.4, SAS Institute Inc. Cary, NC 27513-2414). A repeated measures analysis was used for main stem height, number of internodes, and internode length. Treatments were analyzed as a fixed effect. Year was treated as a random effect due to little variation between year and location. An analysis of variance (ANOVA) was used for yield, % *R. solani*, and economic return. Means of significant difference were separated using Tukey-Kramer least significant difference (LSD) post-hoc test at a 0.05 probability level.

RESULTS AND DISCUSSION

General Observations

Prohexadione calcium treatments (OD and WDG) in peanuts led to similar visual changes. Within 7–10 days, treated rows showed more defined canopy architecture, with prominent main stems forming a triangular shape, unlike the flat, indistinct canopies of untreated rows (Figure 1).

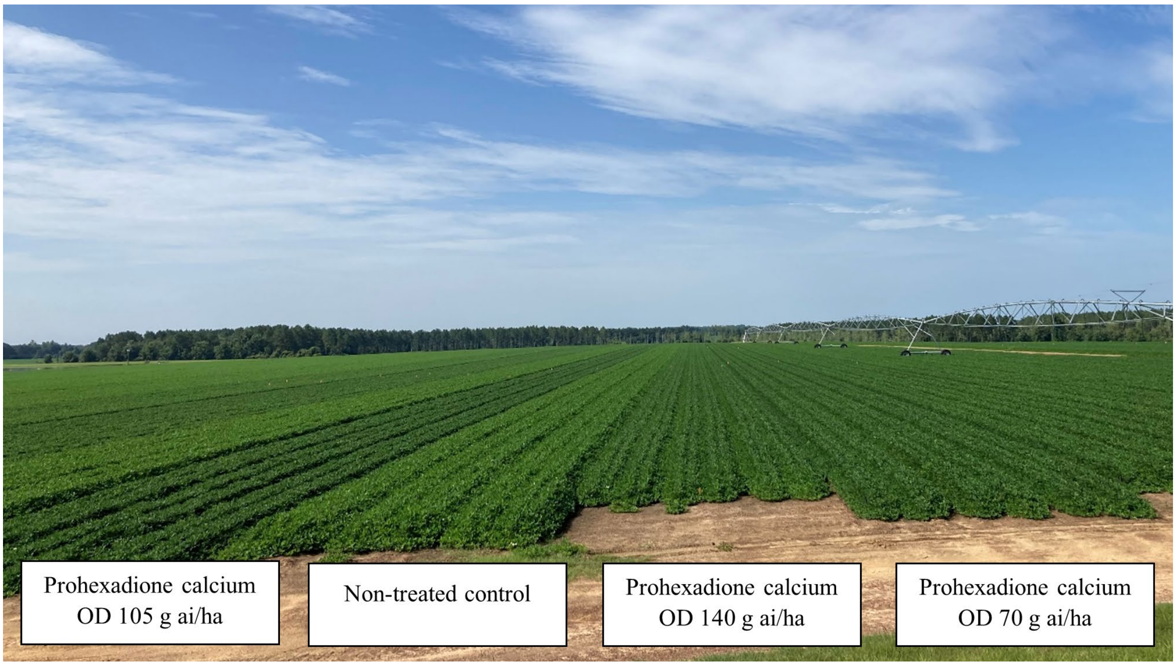

Figure 1. Vine growth response of Georgia-12Y to oil dispersion (OD) prohexadione calcium treatments in 2021 in Tift County, Georgia. Prohexadione calcium OD is formulated and sold by Fine-Americas Inc. under the trade name of Kudos®.

These effects were more noticeable in 2021 due to higher rainfall. Treated plants also had darker green leaves within a week, though this darkening faded 35–48 days post-application due to new growth. Prior studies support these findings, noting improved row visibility and more uniform windrows at digging (Figure 2), especially under high rainfall conditions (Mitchem *et al.*, 1996; Culpepper *et al.*, 1997; Jordan *et al.*, 2001; Faircloth *et al.*, 2005; Jordan *et al.*, 2008; Studstill *et al.*, 2020). Untreated plots had denser, less uniform canopies, causing vines to spill into row middles.

Figure 2. Inverted peanuts in 2021 with non-treated rows (left) and rows treated with two applications of prohexadione calcium at 105 g ai/ha (right) in Tift County, Georgia.

Vine Growth Suppression

Main stem height, number of internodes, and length of internodes were assessed over four SD to evaluate vine growth. The interaction of treatment by time was significant for main stem height but not significant for number of internodes or length of internodes (Table 2). Significant differences were observed for main stem height at SD2, SD3, and SD4 (Table 3). At SD2, all prohexadione calcium treatments significantly inhibited main stem height by 14 to 18% in comparison to the non-treated control. Similarly, all treatments of prohexadione calcium continued to inhibit main stem height at SD3 where main stem height was significantly less than the non-treated control by 16 to 28%. These findings are consistent with trials conducted by Studstill *et al.* (2020), where main stem height was significantly greater for non-treated plots than any rate of prohexadione calcium when sampled 2 wk following the second application. Monfort and Tubbs (2021) recorded similar responses in small plot trials to prohexadione calcium at all rates significantly reducing main stem height below the non-treated.

Table 2. Analysis of variance for mainstem height, number of internodes, and internode length in 2021 and 2022[a] on runner market-type cultivars.

	Mainstem Height (cm)		Number of Internodes		Internode Length (cm)	
Treatment	F	P value	F	P value	F	P value
Prohexadione calcium	51.26	<.0001	2.17	0.0761	21.12	<.0001
Time	110.38	<.0001	169.34	<.0001	26.26	<.0001
Prohexadione calcium x Time	2.54	0.0047	0.51	0.9048	1.40	0.1713

[a]Year was treated as a random effect for year and location; therefore, data were pooled across years.

Table 3. Effect of prohexadione calcium on mainstem height over time across field trials conducted in 2021 and 2022[a] in Tifton, GA.

	Mainstem Height (cm)			
Treatment	SD1[b]	SD2[c]	SD3[d]	SD4[e]
Non-treated control	34.5 a[f]	44.7 a	53.4 a	61.6 a
OD Formulation (140 g ai/ha)	34.8 a	36.5 b	38.4 c	49.2 c
OD Formulation (105 g ai/ha)	34.4 a	37.3 b	41.0 bc	48.5 c
OD Formulation (70 g ai/ha)	33.6 a	38.3 b	42.7 bc	51.8 bc
WDG Formulation (105 g ai/ha)	33.6 a	38.0 b	44.7 b	56.3 ab

[a]Year was treated as a random effect for year and location; therefore, data were pooled across years.
[b]SD1 = Sample Date 1 – Just prior to the first application of prohexadione calcium (55-65 DAP)
[c]SD2 = Sample Date 2 – Just prior to the second application of prohexadione calcium (70-79 DAP)
[d]SD3 = Sample Date 3 – 14 days after the second application of prohexadione calcium (85-94 DAP)
[e]SD4 = Sample Date 4 – 28 days after the second application of prohexadion calcium (99-108 DAP)
[f]Means followed by the same letter in a column are not significantly different at a 0.05 probability level.

At SD4, prohexadione calcium OD regardless of rate significantly reduced main stem height compared to the non-treated by 16 to 21%. Prohexadione calcium WDG was not significantly different from the non-treated control and had a significantly taller main stem height compared to the OD formulation at 140 g ai/ha and 105 g ai/ha. Prohexadione calcium OD had a greater effect on main stem height over time, consistently suppressing vine growth 2 and 4 wk after the second application of prohexadione calcium below the non-treated control. This could be attributed to a stronger physiological reaction within the plant with the OD formulation since the suppressive effects of the WDG formulation began to diminish 2 wk after the second application.

The main effect of prohexadione calcium treatment was significant for internode length, but not for number of internodes (Table 2). All prohexadione calcium treatments significantly reduced internode length by 0.5 to 0.9 cm compared to the non-treated control (Table 4). This resulted in a 12.0 to 14.0% reduction in internode length. Prohexadione calcium OD at any rate further reduced internode length by 11.5 to 13.4% compared to prohexadione calcium WDG. Reductions in internode length were also observed by Studstill (2021) when prohexadione calcium was applied at 105 g ai/ha. Internodes in the non-treated control were significantly longer than those treated with prohexadione calcium. No significant differences among treatments for number of internodes indicates that reductions in main stem height are attributed to changes in internode length not the number of internodes. This supports findings made by Mitchem *et al.* (1996) who concluded prohexadione calcium had no effect on the number of nodes on either the main stem or cotyledonary lateral branch and attributed the changes in growth to shortening of the internodes.

Table 4. E ffect of prohexadione calcium on number of mainstem internodes and internode length across field trials conducted in 2021 and 2022[a] in Tifton, GA.

Treatment	Number of Internodes[b]	Internode Length (cm)[c]
Non-treated control	12.5 a[d]	3.7 a
OD Formulation (140 g ai/ha)	12.2 a	2.8 c
OD Formulation (105 g ai/ha)	12.2 a	2.8 c
OD Formulation (70 g ai/ha)	12.6 a	2.8 c
WDG Formulation (105 g ai/ha)	12.3 a	3.2 b

[a]Year was treated as a random effect for year and location; therefore, data were pooled across years.
[b]Average number of internodes across all four sample dates
[c]Average internode length across all four sample dates.
[d]Means followed by the same letter in a column are not significantly different at a 0.05 probability level

Rhizoctonia Limb Rot

Rhizoctonia solani incidence was assessed based on percent colonization of the fungus on the leaves, stems, roots, and pods of inverted plants. Percent *Rhizoctonia solani* was significantly reduced (F-value = 11.67 with a P <.0001) in all prohexadione calcium treatments compared to the non-treated control by 9 to 15% (Figure 3). It is probable that the change in canopy architecture provided by prohexadione calcium treatments improved fungicide penetration and increased airflow within the canopy compared to the non-treated control. Greater disease severity has been observed in peanut with excessive vine growth due to reductions in air flow, increased moisture within the canopy, and reduced fungicide penetration (Bauman and Norden, 1971; Gorbet and Rhoads, 1975; Henning *et al.*, 1982). Reductions in *R. solani* may also be due to improved row visibility in treated rows where vines were less susceptible to mechanical damage. Excessive vine growth has been shown to increase vine damage by equipment during mid and late-season pesticide applications due to reductions in row visibility (Wu and Santelmann, 1977).

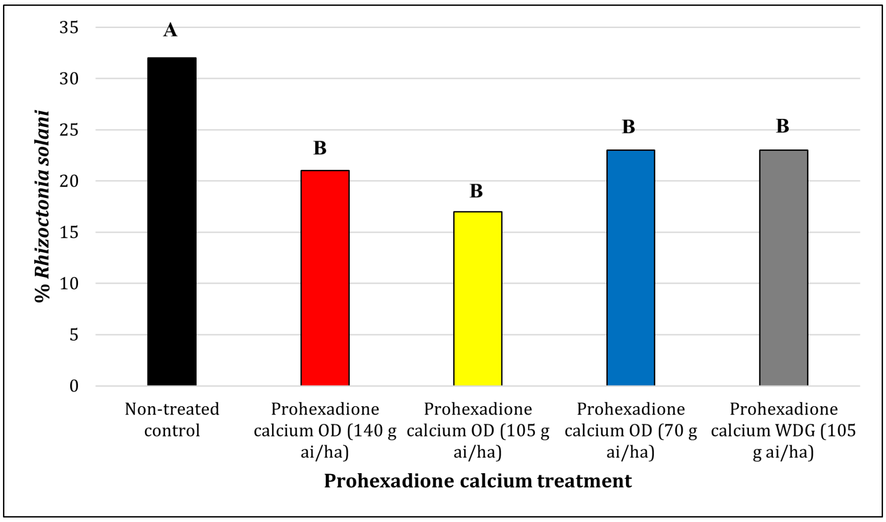

Figure 3. Percent incidence of Rhizoctonia solani on Georgia-12Y in response to prohexadione calcium treatments across field trials conducted in Tift County, GA in 2021 and 2022. Rhizoctonia solani incidence was evaluated following digging and inversion. Means followed by the same letter in a column are not significantly different at a 0.05 probability level.

Yield and Grade

Significant differences in yield were observed in the prohexadione calcium treatments (Table 5). Pod yield was significantly greater for prohexadione calcium OD at 70 g ai/ha and prohexadione calcium WDG at 105 g ai/ha than the non-treated control by 594-595 kg/ha (Table 6). The application of prohexadione calcium as a WDG at 105 g ai/ha has increased yield over the non-treated control across several experiments on runner market-type cultivars. Monfort and Tubbs (2021) observed prohexadione calcium applied at 105 g ai/ha in small plot trials increased yield over the non-treated control and in some instances over 140 g ai/ha. Similar observations were made in large plot trials on runner market-type cultivars (Studstill *et al.*, 2020; Monfort *et al.*, 2021). Conversely, when full and reduced rates were applied to virginia market-type cultivars, no yield differences were observed for small plot trials (Studstill *et al.*, 2020). Although the greatest vine growth suppression was exhibited by prohexadione calcium at 140 g ai/ha and 105 g ai/ha, further reduction in vine growth did not correlate to increased yield (Table 6). Prohexadione calcium OD at 70 g ai/ha and the WDG at 105 g ai/ha provided similar reductions in vine growth and subsequently produced similar yields (Table 6).

Table 5. Analysis of variance for yield, total sound mature kernels, loan value, gross return, and net return for prohexadione calcium treatments on peanut trials in 2021 and 2022[a] in Tift County, Georgia.

	Yield (kg/ha)		% TSMK[b]		Loan Value[c] ($/ton)		Gross Return[d] ($/ha)		Net Return[e] ($/ha)	
Treatment	F	P value	F	P value	F	P value	F	P value	F	P value
Prohexadione Calcium	3.62	0.0174	1.09	0.3814	0.93	0.4621	2.03	0.1190	1.14	0.3608

[a]Year was treated as a random effect for year and location; therefore, data were pooled across years.
[b]% TSMK = % total sound mature kernels (sound mature kernels + sound splits)
[c]Loan value = $355 ± premiums or deductions in grade.
[d]Gross Return = Gross dollar value per hectare was calculated based on yield (kg/ha) * the dollar values per metric ton.
[e]Net Return = Net dollar value per hectare was calculated based on gross return – cost of prohexadione calcium applications.

Table 6. Effect of prohexadione calcium on yield, total sound mature kernels, loan value, gross value, and net return for Georgia-12Y in 2021 and 2022[a] in Tift County, Georgia.

Treatment	Yield (kg/ha)	% TSMK[b]	Loan Value[c] ($/metric ton)	Gross Return[d] ($/ha)	Net Return[e] ($/ha)
Non-treated control	6460 b[f]	74 a	319 a	1023 a	1023 a
OD Formulation (140 g ai/ha)	6837 ab	73 a	316 a	1070 a	1024 a
OD Formulation (105 g ai/ha)	7009 ab	73 a	319 a	1110 a	1072 a
OD Formulation (70 g ai/ha)	7054 a	74 a	318 a	1113 a	1084 a
WDG Formulation (105 g ai/ha)	7055 a	73 a	312 a	1093 a	1056 a

[a]Year was treated as a random effect for year and location; therefore, data were pooled across years.
[b]% TSMK = % total sound mature kernels (sound mature kernels + sound splits)
[c]Loan value = $355 ± premiums or deductions in grade.
[d]Gross Return = Gross dollar value per hectare was calculated based on yield (kg/ha) * the dollar values per metric ton.
[e]Net Return = Net dollar value per hectare was calculated based on gross return – cost of prohexadione calcium applications – additional pesticide costs.
[f]Means followed by the same letter in a column are not significantly different at a 0.05 probability level.

No significant differences were observed among treatments for TSMK (Table 5). TSMK was 73 to 74%, varying by 1 point among all treatments (Table 6). Monfort *et al.* (2021) reported that prohexadione calcium increased TSMK by 0.1% on runner market-type cultivars, whereas Culpepper *et al.* (1997) observed a 2% increase in TSMK on virginia market-type cultivars. Other studies conducted on virginia market-type cultivars showed no increase in TSMK (Mitchem *et al.*, 1996; Jordan *et al.*, 2001).

Economic Return

Prohexadione calcium treatment had no effect on loan value, gross revenue, or net revenue (Table 5). This is opposite to the results of Monfort *et al.* (2021) that showed prohexadione calcium at 105 g ai/ha increased gross revenue and net revenue compared to the non-treated control. Similar studies evaluated multiple rates of prohexadione calcium on runner market-type cultivars in small and large plot trials. These studies concluded that prohexadione calcium at 70 g ai/h and 105 g ai/ha increased net revenue over the non-treated control, whereas 140 g ai/ha did not provide a significant increase in net revenue.

Lack of net revenue response to prohexadione calcium is likely due to excessive rainfall and number of rainy days in 2021 and 2022 that impacted yield and grade (Table 7). Yield and grade were negatively impacted in both years due to periods of abundant rainfall during pod development and maturity. Waterlogged conditions during pod development have been shown to reduce pod number, pod weight, and overall yield of peanut (Zeng *et al.*, 2020; Bishnoi and Krishnamoorthy, 1992). In 2022, reductions in yield and grade were also attributed to a 2 wk period of temperatures above 35 C in June where there was limited rainfall (W. S. Monfort, personal communication, October 2022). Temperatures above 35 C significantly reduce pollination, photosynthetic activity, and pod development (Ketring, 1984). Due to its indeterminate growth habit, new pegs did not develop during this period and the maturity of the already developing pods was delayed (W. S. Monfort, personal communication, October 2022). Therefore, plants had fewer pods and a greater percentage of the harvested pods were immature, reducing overall TSMK. The environmental stress coupled with the additional stress from the prohexadione calcium application likely attributed to the lack of differences in net revenue.

Table 7. Cumulative Rainfall (mm) and Number of Rainy Days in Tift County, Georgia - July 1 to September 1 from 2010 to 2022[a].

July 1 To September 1	Precipitation[mm]	Number of Rainy Days
2010	231.9	30
2011	148.3	17
2012	421.6	32
2013	335.5	37
2014	97.8	19
2015	370.8	23
2016	145.0	24
2017	131.3	24
2018	351.0	37
2019	306.8	25
2020	192.0	31
2021	365.0	41
2022	349.3	35
2010-2020	248.4	27

[a]Weather data was collected through the University of Georgia (UGA) Weather Station located at the UGA Ponder Farm at TyTy, Georgia.

Conclusion

This study examined the efficacy of prohexadione calcium OD at multiple rates on vine growth suppression, *R. solani*, yield and economic return on runner market-type cultivars. Prohexadione calcium OD at the labeled and reduced rates suppressed vine growth and reduced *R. solani* incidence for runner peanuts. Previous studies indicated that prohexadione calcium effectively reduced vegetative growth, improved canopy architecture, and reduced disease susceptibility (Mitchem *et al.*, 1996; Culpepper *et al.*, 1997). The OD formulation additionally provided longer growth suppression by 4 wk compared to the WDG formulation suggesting that the OD has increased efficacy over the WDG.

Greater suppression of vine growth did not contribute to increases in yield. Response to yield was dependent on prohexadione calcium OD rate. Prohexadione calcium OD at 70 g ai/ha provided a significant increase in yield by 595 kg/ha. The two higher rates of prohexadione calcium OD did not significantly influence yield response. Although the OD provides greater efficacy on vine growth, prolonged suppression of vine growth from greater application rates may hinder potential yield increases. Prohexadione calcium WDG increased yield similarly to other studies conducted on runner market-type cultivars (Monfort *et al.*, 2021; Studstill *et al.*, 2020). However, whereas these other studies observed increases in net revenue from reduced rates of prohexadione calcium, no differences in net revenue were seen in this study due to environmental constrains that affected yield and grade in 2021 and 2022.

The results indicate that although prohexadione calcium did not provide a monetary increase in net revenue due to environmental variations, improvements in row visibility, disease suppression, and digging efficiency are valuable to producers. Future research is necessary to quantify these benefits provided by prohexadione calcium and determine how they enhance overall production.

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