



2021 PEANUT WEED SCIENCE REPORT

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Peanut weed management trials were conducted at the Oklahoma State University Caddo Research Station near Fort Cobb in 2021. Spanish peanut 'Ole' was planted on May 6, 2021, in 36-inch rows. The average temperature for May was 66 F and June was 77 F. The average minimum temperature was 57 F for May (10 d <60 F, 5 d < 50 F) and 66 F for June (7 d <60). This combined with 4.43 inches of rain in May and 7.37 inches in June led to slow development of peanut growth during the late spring and early summer. Additionally, in some situations, poor nodule development was observed and thus plants exhibiting nitrogen deficiency. Under these circumstances, weed control was a challenge. Preemergence (PRE) treatments were applied immediately after planting. For the Gramoxone Tolerance study, the entire trial received an overlay of Prowl (1 qt/A) preplant incorporated (PPI), Valor (2 oz/A) PRE, Cobra (12.5 fl oz/A) + Basagran (1 qt/A) + Butyrac 200 (1 pt/A) + Warrant (1 qt/A) + Shadow (1 pt/A) + Dyne-Amic (6 oz/A) POST, and a mid-season application of nitrogen (120 lb/A 46-0-0). This trial was maintained weed free throughout the growing season. All weed management trials were irrigated and managed for disease throughout the growing season. Trials were visually evaluated for peanut response and weed control. Peanuts were dug (Oct. 8), field dried and harvested (Oct. 19). Peanuts received 3.85 inches of rain between digging and thrashing.

Trial PFCS21-01 was established to evaluate preemergence combinations of Valor (2 oz/A), Outlook (12.8 fl oz/A) and Pursuit for weed control in peanuts. Pursuit was either applied PRE at 4 fl oz/A or as a split treatment PRE (2 fl oz/A) + At-Crack (2 fl oz/A). All treatments included the following applications: PRE-Prowl H2O (32 fl oz/A), At-Crack-Gramoxone (16 fl oz/A) + Zidua (1.75 fl oz/A) + Agri-Dex (1% v/v), POST1-Cobra (12.5 fl oz/A) + 2,4-DB (21 fl oz/A) + Agri-Dex (1% v/v), POST2-Select Max (16 fl oz/A) + Agri-Dex (1% v/v).

All treatments that included Pursuit in combination with Valor and/or Outlook controlled Palmer amaranth (pigweed) at least 95% except Outlook + Pursuit PRE season long (Table 1). Treatments that included Pursuit either PRE or PRE + AC (At-Crack) controlled Texas panicum (Coloradograss) over 90% except Pursuit PRE in combination with Valor or Valor + Outlook (Table 2). The only treatments that controlled ivyleaf morningglory at least 90% season long were Pursuit PRE alone or with Valor and Valor + Outlook + Pursuit PRE + AC (Table 3).

Yellow nutsedge populations were highly variable in this trial (Table 4). The only treatments that controlled yellow nutsedge at least 80% late season was Pursuit PRE alone and Pursuit PRE + AC alone and in combination with Outlook. Peanut injury was less than 10% with any treatment combination season long (Table 5). All treatments yielded higher than the untreated check (1990 lb/A), while there were no other differences between treatments (Table 5). Pursuit PRE alone and Pursuit PRE + AC alone or in combination with Outlook or Valor + Outlook all yielded greater than 4,000 lb/A. This research indicates the needs of a residual program that includes multiple modes of action, especially across a diverse weed spectrum.

Trial PFCS21-03 was established to evaluate the response of peanut to POST applications of

Gramoxone alone and in combination with Dual Magnum. Gramoxone 3.0 SL was applied at 10.8 (1X) and 21.6 (2X) fl oz/A either alone or in combination with Dual Magnum at 21.3 (1X) and 42.6 (2X) fl oz/A. Applications were made at 14 days after crack (DAC), 28 DAC, or 14 + 28 DAC. All treatments were applied with Induce (non-ionic surfactant) at 0.25% v/v except the treatment that included Agri-Dex.

Peanut stands were not affected by any treatment throughout the growing season (Table 6). All treatments resulted in approximately 10% burning after the initial application (Table 7). Herbicide rate or the addition of Dual Magnum did not routinely contribute to an increase peanut leaf burn. Peanut stunting was less than 10% during the first 47 DAP with all single applications applied at 14 DAC (Table 8). Two applications of Gramoxone alone or in combination with Dual Magnum at the 2X rate resulted in at least 10% stunting of plants season long. Peanut injury was at least 10% with all 14 DAC on initial evaluation (Table 9).

Peanut injury evaluated after the 28 DAC applications was at least 10% with all treatments except the 14 and 28 DAC applied at the 1X rate. Peanut injury was 10-16% when Gramoxone was applied twice (14 + 28 DAC) alone or in combination with Dual Magnum at the 2X rate. These were also the only treatments that reduced yield when compared to the weed-free check (3490 lb/A). The addition of Dual Magnum or Agri-Dex did not result in an increase in injury when compared to similar treatments that did not include these products. This research indicates that while substantial injury may be observed with Gramoxone, this does not necessarily translate into a yield loss. Additionally, the addition of Dual Magnum to assist in providing residual weed control does not increase the potential for injury.

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Table 1. Palmer amaranth control with combinations of Valor, Outlook, and Pursuit at Fort Cobb, 2021.

PRE Treatments ^a	18	28	47	77	92
	DAP	DAP	DAP	DAP	DAP
	% Control				
Valor®	100	100	100	75	75
Outlook®	100	100	97	96	93
Pursuit®	100	100	99	96	94
Pursuit ® (PRE + AC)	100	100	98	95	93
Valor® + Pursuit®	100	100	100	100	100
Valor® + Pursuit® (PRE + AC)	100	100	100	100	98
Outlook® + Pursuit®	100	100	97	95	93
Outlook® + Pursuit® (PRE + AC)	100	100	96	97	96
Valor® + Outlook® + Pursuit®	100	100	99	99	99
Valor® + Outlook® + Pursuit® (PRE +AC)	100	100	99	99	97
LSD P=.10	NS	0.4	4	18	19
CV	0	0.4	4	17	18
Treatment Prob (F)	1.0000	0.0001	0.0001	0.0001	0.0001

^aAll treatments included the following applications: PRE - Prowl® H2O (32 fl oz/A), At-Crack - Gramoxone® (16 fl oz/A) + Zidua® (1.75 fl oz/A) + Agridex® (1% v/v), POST1 - Cobra® (12.5 fl oz/A + 2,4-DB (21 fl oz/A) + Agridex® (1% v/v), POST2 - Select Max® (16 fl oz/A) + Agridex® (1% v/v). PRE = preemergence, AC = at-crack, DAP = days after planting, LSD = least significant difference, CV = coefficient of variation, NS = not significant



Table 2. Texas panicum control with combinations of Valor, Outlook, and Pursuit at Fort Cobb, 2021.

PRE Treatments ^a	18	28	47	77	92
	DAP	DAP	DAP	DAP	DAP
	% Control				
Valor®	93	97	76	69	67
Outlook®	97	99	89	100	99
Pursuit®	97	99	97	100	100
Pursuit ® (PRE + AC)	90	99	97	98	97
Valor® + Pursuit®	95	97	75	93	92
Valor® + Pursuit® (PRE + AC)	95	97	97	98	98
Outlook® + Pursuit®	98	99	93	100	99
Outlook® + Pursuit® (PRE + AC)	97	99	96	98	97
Valor® + Outlook® + Pursuit®	97	97	87	98	99
Valor® + Outlook® + Pursuit® (PRE +AC)	95	99	96	100	98
LSD P=.10	3	2	15	18	18
CV	3	2	15	17	18
Treatment Prob (F)	0.0001	0.0001	0.0001	0.0001	0.0001

^aAll treatments included the following applications: PRE - Prowl® H2O (32 fl oz/A), At-Crack - Gramoxone® (16 fl oz/A) + Zidua® (1.75 fl oz/A) + Agridex® (1% v/v), POST1 - Cobra® (12.5 fl oz/A + 2,4-DB (21 fl oz/A) + Agridex® (1% v/v), POST2 - Select Max® (16 fl oz/A) + Agridex ®(1% v/v). PRE = preemergence, AC = at-crack, DAP = days after planting, LSD = least significant difference, CV = coefficient of variation, NS = not significant



Table 3. Ivyleaf morningglory control with combinations of Valor, Outlook, and Pursuit at Fort Cobb, 2021.

PRE Treatments ^a	18	28	47	77	92
	DAP	DAP	DAP	DAP	DAP
	% Control				
Valor®	97	87	80	72	71
Outlook®	97	83	81	97	95
Pursuit®	99	98	91	96	95
Pursuit® (PRE + AC)	93	95	86	96	96
Valor® + Pursuit®	100	98	95	98	98
Valor® + Pursuit® (PRE + AC)	96	96	86	97	99
Outlook® + Pursuit®	95	89	75	98	96
Outlook® + Pursuit® (PRE + AC)	93	84	71	95	95
Valor® + Outlook® + Pursuit®	97	95	76	98	98
Valor® + Outlook® + Pursuit® (PRE +AC)	97	97	95	97	95
LSD P=.10	5	10	15	17	17
CV	4	10	17	17	17
Treatment Prob (F)	0.0001	0.0001	0.0001	0.0001	0.0001

^aAll treatments included the following applications: PRE - Prowl® H2O (32 fl oz/A), At-Crack - Gramoxone® (16 fl oz/A) + Zidua® (1.75 fl oz/A) + Agridex® (1% v/v), POST1 - Cobra® (12.5 fl oz/A + 2,4-DB (21 fl oz/A) + Agridex® (1% v/v), POST2 - Select Max® (16 fl oz/A) + Agridex® (1% v/v). PRE = preemergence, AC = at-crack, DAP = days after planting, LSD = least significant difference, CV = coefficient of variation, NS = not significant



Table 4. Yellow nutsedge control with combinations of Valor, Outlook, and Pursuit at Fort Cobb, 2021.

PRE Treatments ^a	28	47	77	92
	DAP	DAP	DAP	DAP
	% Control			
Valor®	73	24	49	54
Outlook®	92	49	70	63
Pursuit®	85	81	83	80
Pursuit ® (PRE + AC)	94	79	91	89
Valor® + Pursuit®	65	13	63	54
Valor® + Pursuit® (PRE + AC)	83	50	70	68
Outlook® + Pursuit®	91	45	70	69
Outlook® + Pursuit® (PRE + AC)	93	79	84	80
Valor® + Outlook® + Pursuit®	80	24	64	60
Valor® + Outlook® + Pursuit® (PRE +AC)	76	46	68	60
LSD P=.10	11	19	16	17
CV	12	37	20	23
Treatment Prob (F)	0.0001	0.0001	0.0001	0.0001

^aAll treatments included the following applications: PRE - Prowl® H2O (32 fl oz/A), At-Crack - Gramoxone® (16 fl oz/A) + Zidua® (1.75 fl oz/A) + Agridex® (1% v/v), POST1 - Cobra® (12.5 fl oz/A + 2,4-DB (21 fl oz/A) + Agridex ®(1% v/v), POST2 - Select Max® (16 fl oz/A) + Agridex® (1% v/v). PRE = preemergence, AC = at-crack, DAP = days after planting, LSD = least significant difference, CV = coefficient of variation, NS = not significant



Table 5. Peanut response to combinations of Valor, Outlook, and Pursuit at Fort Cobb, 2021.

PRE Treatments ^a	18 DAP	28 DAP	47 DAP	77 DAP	92 DAP	Yield lb/A
	% Control					
Valor®	8	5	3	3	3	3610
Outlook®	8	5	4	3	1	3390
Pursuit®	8	5	5	1	1	4060
Pursuit® (PRE + AC)	9	5	3	3	1	4110
Valor® + Pursuit®	9	5	6	1	3	3780
Valor® + Pursuit® (PRE + AC)	9	5	5	1	1	3590
Outlook® + Pursuit®	9	5	5	1	1	3680
Outlook® + Pursuit® (PRE + AC)	9	5	5	1	3	4110
Valor® + Outlook® + Pursuit®	9	6	5	1	3	3640
Valor® + Outlook® + Pursuit® (PRE +AC)	8	6	5	3	3	4150
LSD P=.10	2	1	3	NS	NS	1010
CV	26	25	55	1000	85	23
Treatment Prob (F)	0.0001	0.0001	0.034	0.5041	0.2612	0.0690

^aAll treatments included the following applications: PRE - Prowl® H2O (32 fl oz/A), At-Crack - Gramoxone® (16 fl oz/A) + Zidua® (1.75 fl oz/A) + Agridex® (1% v/v), POST1 - Cobra® (12.5 fl oz/A + 2,4-DB (21 fl oz/A) + Agridex® (1% v/v), POST2 - Select Max® (16 fl oz/A) + Agridex® (1% v/v). PRE = preemergence, AC = at-crack, DAP = days after planting, LSD = least significant difference, CV = coefficient of variation, NS = not significant



Table 6. Gramoxone® rates, timings, and combinations effects on peanut stand at Fort Cobb, 2021.

Treatments ^a	Rate (fl oz/A)	Timing	% Stand Reduction				
			33 DAP	47 DAP	61 DAP	77 DAP	92 DAP
Gramoxone®	10.8	14 DAC	1	1	1	1	0
+ Dual Magnum®	21.3	14 DAC	3	4	4	3	0
Gramoxone®	10.8	28 DAC	-	-	4	4	0
+ Dual Magnum®	21.3	28 DAC	-	-	1	1	0
Gramoxone®	21.6	14 DAC	1	1	1	1	0
+ Dual Magnum®	42.6	14 DAC	1	1	1	1	0
Gramoxone®	21.6	28 DAC	-	-	3	3	0
+ Dual Magnum®	42.6	28 DAC	-	-	3	3	0
Gramoxone®	10.8	14 + 28 DAC	1	1	1	1	0
+ Dual Magnum®	21.3	14 + 28 DAC	1	1	1	1	0
Gramoxone®	21.6	14 + 28 DAC	3	3	3	3	0
+ Dual Magnum®	42.6	14 + 28 DAC	4	4	4	4	0
GM® + DM® + Agri-Dex®	10.8 + 21.3 + 1%	28 DAC	-	-	3	1	0
GM® + DM® + Basagran®	10.8 + 21.3 + 16	28 DAC	-	-	3	3	0
LSD P=.10			NS	NS	NS	NS	NS
CV			148	135	125	135	0
Treatment Prob (F)			0.6311	0.4109	0.7112	0.8039	1.0000

^aAll treatments applied with Induce (0.25 %v/v) except where Agri-Dex® was applied. GM - Gramoxone®, DM = Dual Magnum®, DAC = days after cracking, LSD = least significant difference, CV = coefficient of variation, DAP = days after planting, NS = not significant



Table 7. Gramoxone rates, timings, and combinations effects on peanut necrosis at Fort Cobb, 2021.

Treatments ^a	Rate (fl oz/A)	Timing	33 DAP	47 DAP	61 DAP	77 DAP	92 DAP
Gramoxone®	10.8	14 DAC	10	10	5	1	0
+ Dual Magnum®	21.3	14 DAC	11	8	5	1	0
Gramoxone®	10.8	28 DAC	-	-	9	1	0
+ Dual Magnum®	21.3	28 DAC	-	-	9	1	0
Gramoxone®	21.6	14 DAC	10	10	5	1	0
+ Dual Magnum®	42.6	14 DAC	11	10	6	1	0
Gramoxone®	21.6	28 DAC	-	-	10	1	0
+ Dual Magnum®	42.6	28 DAC	-	-	10	1	0
Gramoxone®	10.8	14 + 28 DAC	10	10	10	3	0
+ Dual Magnum®	21.3	14 + 28 DAC	10	10	9	1	0
Gramoxone®	21.6	14 + 28 DAC	10	10	10	5	0
+ Dual Magnum®	42.6	14 + 28 DAC	10	10	9	4	0
GM® + DM® + Agri-Dex®	10.8 + 21.3 + 1%	28 DAC	-	-	9	3	0
GM® + DM® + Basagran®	10.8 + 21.3 + 16	28 DAC	-	-	10	1	0
LSD P=.10			2	2	2	NS	NS
CV			13	19	25	136	0
Treatment Prob (F)			0.0001	0.0001	0.0001	0.4101	1.0000

^aAll treatments applied with Induce (0.25 %v/v) except where Agri-Dex® was applied. GM - Gramoxone®, DM = Dual Magnum®, DAC = days after cracking, LSD = least significant difference, CV = coefficient of variation, DAP = days after planting, NS = not significant



Table 8. Gramoxone rates, timings, and combinations effects on peanut stunting Fort Cobb, 2021.

Treatments ^a	Rate (fl oz/A)	Timing	% Stunting				
			33 DAP	47 DAP	61 DAP	77 DAP	92 DAP
Gramoxone®	10.8	14 DAC	1	8	9	5	4
+ Dual Magnum®	21.3	14 DAC	3	8	9	8	6
Gramoxone®	10.8	28 DAC	-	-	5	5	3
+ Dual Magnum®	21.3	28 DAC	-	-	5	6	4
Gramoxone®	21.6	14 DAC	3	9	10	9	5
+ Dual Magnum®	42.6	14 DAC	6	9	14	9	8
Gramoxone®	21.6	28 DAC	-	-	10	6	6
+ Dual Magnum®	42.6	28 DAC	-	-	8	9	5
Gramoxone®	10.8	14 + 28 DAC	4	8	11	8	6
+ Dual Magnum®	21.3	14 + 28 DAC	1	6	8	9	8
Gramoxone®	21.6	14 + 28 DAC	1	8	13	11	10
+ Dual Magnum®	42.6	14 + 28 DAC	3	9	15	20	16
GM® + DM® + Agri-Dex®	10.8 + 21.3 + 1%	28 DAC	-	-	9	8	5
GM® + DM® + Basagran®	10.8 + 21.3 + 16	28 DAC	-	-	6	8	6
LSD P=.10			2	3	4	4	3
CV			76	35	35	40	41
Treatment Prob (F)			0.0035	0.0008	0.0001	0.0001	0.0001

^aAll treatments applied with Induce (0.25 %v/v) except where Agri-Dex® was applied. GM - Gramoxone®, DM = Dual Magnum®, DAC = days after cracking, LSD = least significant difference, CV = coefficient of variation, DAP = days after planting, NS = not significant



Table 9. Gramoxone rates, timings, and combinations effects on peanut injury and yield at Fort Cobb, 2021.

Treatments ^a	Rate (fl oz/A)	Timing	% Stand Reduction					Yield lb/A
			33 DAP	47 DAP	61 DAP	77 DAP	92 DAP	
Gramoxone®	10.8	14 DAC	11	11	9	6	4	3410
+ Dual Magnum®	21.3	14 DAC	11	11	9	8	6	3330
Gramoxone®	10.8	28 DAC	-	-	9	6	3	3570
+ Dual Magnum®	21.3	28 DAC	-	-	9	9	4	3490
Gramoxone®	21.6	14 DAC	11	13	13	10	6	3340
+ Dual Magnum®	42.6	14 DAC	14	13	15	9	8	3350
Gramoxone®	21.6	28 DAC	-	-	13	8	6	3460
+ Dual Magnum®	42.6	28 DAC	-	-	11	10	5	3510
Gramoxone®	10.8	14 + 28 DAC	11	11	13	9	6	3330
+ Dual Magnum®	21.3	14 + 28 DAC	10	10	11	11	8	3330
Gramoxone®	21.6	14 + 28 DAC	11	10	16	14	10	2980
+ Dual Magnum®	42.6	14 + 28 DAC	13	13	20	25	16	2700
GM® + DM® + Agri-Dex®	10.8 + 21.3 + 1%	28 DAC	-	-	13	10	5	3370
GM® + DM® + Basagran®	10.8 + 21.3 + 16	28 DAC	-	-	10	10	6	3440
LSD P=.10			3	3	5	4	3	400
CV			23	25	36	32	35	10
Treatment Prob (F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0705

^aAll treatments applied with Induce (0.25 %v/v) except where Agri-Dex® was applied. GM - Gramoxone®, DM = Dual Magnum®, DAC = days after cracking, LSD = least significant difference, CV = coefficient of variation, DAP = days after planting, NS = not significant