

New Rice Herbicide

Kassim Al-Khatib

University of California, Davis



Percent Proportion of Herbicide Resistance for each Herbicide Tested from 2015 to 2020

Herbicide	Total Samples Tested	-----%----- Resistant
Thiobencarb	495	44
Clomazone	459	6
Propanil	448	87
Cyhalofop	382	58
Bispyribac-sodium	380	85
Penoxsulam	379	83
Benzobicyclon/Halosulfuron-methyl	333	12
Carfentrazone	215	7
Bensulfuron-methyl ^a	104	99
Triclopyr	70	1
Halosulfuron-methyl	77	96

New Herbicides

- Pyraclonil
- Florpyrauxifen - benzyl
- TVE29
- Oxyfluorfen on Roxy rice

New Herbicide

- Pyraclonil (Zembu) is a PPO inhibitor from Nichino America
- Effective herbicide in continuous-flooding system
- Broad spectrum weed control - grasses, broadleaf and sedges
- Application timing is day of seeding

			YIELD (lbs/A)
Herbicide Program	Rate/Acre	Timing	
Untreated	-	-	4949
Zembru	14.9 lb	DOS	9,737
Propanil + COC	6 qt+2.5%v/v	5 LSR	
Zembru	14.9 lb	DOS	10,487
Butte	7.5 lb	1.5 LSR	
Propanil + COC	6 qt+2.5%v/v	5 LSR	
Cerano	6 lb	DOS	10,507
Zembru	14.9 lb	DOS	
Propanil + COC	6 qt+2.5%v/v	5 LSR	
Zembru	14.9 lb	DOS	9,935
Thiobencarb	23.3 lb	1.5 LSR	
Propanil + COC	6 qt+2.5%v/v	5 LSR	
Zembru	14.9 lb	DOS	10,014
Propanil + COC	6 qt+ 2.5%v/v	5 LSR	
Regiment + DyneAmic	0.8 oz+5 fl oz	Early-tiller	
Zembru	14.9 lbs	DOS	9,878
Granite	15 lb	3 LSR	
Propanil + COC	6 qt+ 2.5%v/v	5 LSR	
Zembru	14.9 lb	DOS	10,866
Propanil + COC	6 qt+ 2.5%v/v	5 LSR	
Loyant + MSO	21.9 fl oz + 0.5 pt	Early-tiller	
Zembru	14.9 lb	DOS	10,795
Clincher	2.5 oz	5 LSR	
Granite	15 lb	5 LSR	



Pyraclonil alone





Untreated

Bolero

Cerano

Butte

Pyraclozil

Zembu studies

- Effect of shallow water flooding on Zembu efficacy
- Water dispersion of Zembu in rice field
- Combination of Zembu with Cerano
- Combination of Zembu with Strada

New Herbicide

- Florpyrauxifen-benzyl, Loyant, Corteva
- Synthetic auxin
- Postemergence and broad window of application
- Broad spectrum weed control - grasses, broadleaf and sedges

Treatments

Treatment	Rate per acre	Timing
Loyant + MSO	1.33 pt+ 8 OZ	4 LSR
Loyant + Clincher + MSO	1.33 pt + 13 OZ + 8 OZ	4 LSR
Cerano/Loyant + MSO	7.5 lb/1.33 pt + 8 OZ	DOS/4 LSR
Butte/Loyant + MSO	7.5 lb/1.33 pt + 8 OZ	1 LSR/4 LSR
Butte/Granite GR	7.5 lb/15 lb	1 LSR/2.5 LSR
Butte/Granite SC + COC	7.5 lb/2.5 OZ + 2.5% v/v OZ	1 LSR/4 LSR
Untreated control		

Rice injury ratings at 20 and 40 DAS

Treatment	Stunting (20DAS)	Bleaching (20 DAS	Stunting (40DAS)	Bleaching (40 DAS
Loyant + MSO	3	0	0	0
Loyant + Clincher + MSO	3	0	0	0
Cerano/Loyant + MSO	4	35	2	0
Butte/Loyant + MSO	3	0	1	0
Butte/Granite GR	8	0	2	0
Butte/Granite SC + COC	4	0	2	0

Weed control 40 DAS

Treatment	Watergrass	Ricefield Bulrush	Smallflower	Ducksalad
Loyant + MSO	98	100	99	99
Loyant + Clincher + MSO	100	100	100	100
Cerano/Loyant + MSO	100	100	100	100
Butte/Loyant + MSO	100	100	100	100
Butte/Granite GR	100	100	100	100
Butte/Granite SC + COC	100	100	100	100

Yield

Treatment	Yield lb/A
Loyant + MSO	9,991
Loyant + Clincher + MSO	9,943
Cerano/Loyant + MSO	9,872
Butte/Loyant + MSO	9,871
Butte/Granite GR	9,831
Butte/Granite SC + COC	9,964
Untreated control	3,666

Loyant, florpyrauxifen-benzyl



TVE29 Research

- New grass control herbicide from FMC
- New mode of Action, dihydroorotate dehydrogenase (DHODH) - the fourth enzymatic step in de novo pyrimidine biosynthesis
- Several research studies were conducted at the rice experiment station since 2016
- Excellent activity on grasses including watergrass and sprangletop
- Our research showed that TVE29 has broad window of application, day of seeding to 5-leaf stage
- Low rate herbicide
- TVE29 will be available in granule form
- Evaluation of California rice variety showed excellent tolerance to TVE29

TVE29 is a good tools to manage herbicide resistant weeds



TVE29



Untreated control



TVE29