

Current Status On Direct Seeding In Paddy In The State Of Andhra Pradesh

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Abstract

Rice, a primary cereal crop cultivated all over the India over the years confronting dynamic changes in socio-economic patterns of the society. Direct seeding is becoming an important alternative of rice transplanting and spreading rapidly in Andhra Pradesh due to unforeseen weather conditions with reduced rainy days, labour shortage along with escalating cost of production. Present study is to identify the potential areas for different direct seeded methods of rice cultivation in Andhra Pradesh.

Context:

Rice stands out as a major consumer of water among various crops, utilizing roughly 80% of the total fresh water resources allocated for irrigation in Asia. However, as water resources are becoming increasingly scarce and facing heightened competition from various sectors, the availability of water for agricultural purposes, including rice cultivation, is on the decline. In India alone, there are 45 million hectares dedicated to rice production, traditionally grown in flooded conditions. Total Consumptive Water Use (TCWU) of 221.2 km³ (221 BCM) per year for rice production in India. In Andhra Pradesh it accounts for 15.5 km³ Total Consumptive Water Use (TCWU) (Sharma et al., 2018). The rising demand for water resources, driven by a growing population, underscores the need to explore water-efficient methods for rice cultivation without compromising yields. Irrigated lowland rice not only exhibits high water consumption but also results in water wastage and land degradation. In recent years, various cultivation methods have been developed to address this challenge.

Depending on the land preparation method used, direct seeding can be either Dry Direct seeding or Wet Direct seeding. Dry direct seeding represents an alternative method for establishing rice crops, holding the potential to conserve both water and labour in rice farming. This system eliminates the need for raising seedlings, puddling the field, and transplanting seedlings into the puddled soil. Instead, primed seeds are directly sown by hand or using a seeder onto the dry, cultivated land, sometimes even without prior tillage. The adoption of direct seeding can reduce the labour required for crop establishment by up to 50%, with the potential for even greater labour savings when machinery is employed for seeding. Furthermore, dry direct seeding can yield comparable or even higher crop yields than traditional puddle-transplanted rice (Rahman., 2019, Bhagavathi et al., 2020 and Shrestha et al., 2021). It also contributes to a reduction in greenhouse gas emissions, the accumulation of substances like arsenic and heavy metals, and enhances soil health when compared to conventional practices. The adoption of a dry direct seeding system for rice-based cropping offers the opportunity to increase cropping diversity, intensity, and ultimately, farm income.

Direct Seeding of the paddy crop is being practiced in the state of Andhra Pradesh in an area of 3,21,415 ha, accounting for 20.61 percent of the total paddy area in the state during Kharif season (15.59 lakh ha). The practice of direct seeding is increasing at a fast pace, replacing the traditional method of transplanting of paddy crop, mainly, due to severe shortage and increased cost of labour, in addition to availability of effective herbicides for control of weeds in direct sown plots (Pathak et al., 2011). The other advantages of direct sowing are early maturity of the crop and saving of about Rs. 5,000 – 6,000/- per acre in the cost of cultivation, compared to the traditional transplanting method, without any significant yield penalties. The DSR method incurred a cultivation cost of 30,994 per hectare, while the TPR method had a higher cost at 35,810 per hectare (Tripathi et al., 2014).

The reduced cultivation cost in the DSR method primarily resulted from lower expenditures on human

labor (6.62%), machinery usage (41.34%), and irrigation (22.45%). Furthermore, the benefit-cost ratio was 2.92 for the DSR method, surpassing the TPR method's ratio of 2.61. Further, the practice of direct seeding of paddy crop is prevalent in different forms in the state of Andhra Pradesh. Dry Direct Seeding is one of the forms, wherein the seed is sown in ploughed fields, either by broadcasting (99,267 ha) or by sowing with seed drill (1,72,378 ha). Dry direct seeding is more prevalent, compared to the other form of direct seeding, namely, wet direct seeding (45,036 ha.) carried out, either by direct broadcasting of sprouted seeds in well puddled and levelled soils (44,369 ha) or by sowing in lines with drum seeder (667 ha.) in puddled and levelled soils. Dry direct seeding in paddy is prevalent in an area of about 2,76,200 ha. of which Dry direct seeding with broadcasting is more popular in the districts of Srikakulam, while dry direct seeding with seed drill is prevalent widely in the districts of Bapatla, Guntur and Krishna. Dry Direct Seeding with broadcasting is practiced in an area of 99,267 ha. in the state, mostly in the district of Srikakulam (79,010 ha.). The other districts in the state in which Dry Direct Seeding with broadcasting is increasing rapidly are Eluru (9474 ha.), P. Manyam (9427 ha.), Vizainagaram (1256 ha.) and Alluri Sita Ramaraju (100 ha.).

Area under Dry Direct Seeding of Paddy crop by broadcasting of seed in AP

S.No.	District	Area (ha.)	Important Mandals
1	Srikakulam	79010	Gara, Sarubujli, Srikakulam, Narasannapeta, and Kotabommali, Amadalavalasa, Etcherla
2	Eluru	9474	Mudinepalli, Mandavalli Kaikaluru, Kalidindi, Pedapadu, Chintalapudi
3	Parvathipuram Manyam (P. Manyam)	9427	Bobbili
4	Vizainagaram	1256	Denkada, Santhakaviti, Bobbili, Badangi, Therlam
5	Alluri Sitharama Raju (ASR)	100	Paderu
	Total	99267	

Source : ANGRAU DAATTC's and KVK's

Dry Direct Seeding with seed drill is adopted in the state in an area of 1,76,933 ha. and is widely prevalent in the district of Bapatla (76,418 ha.), Guntur (51443 ha.) and Krishna (44207 ha.). The other districts wherein the practice is catching up are Nandyal (4390 ha.), Srikakulam (200 ha.), Anakapalle (192 ha.), Tirupati (41 ha.), Vishakapatnam (34 ha.) and Vizianagaram (8 ha.). Several Farmer Based Organizations (FBO) and Non-government organizations (NGO) are taking up the dry direct seeding with seed drill on custom hiring basis along with other operations, starting from land preparation to harvesting, including, weeding and need based plant protection, resulting in complete seed to seed mechanization and thereby, resulting in reduced cost of cultivation, ranging from Rs. 15,000/- to 20,000/- per acre.

Area under Dry Direct Seeding of Paddy crop by Seed Drill in AP

S.No.	District	Area (ha.)	Important Mandals
1	Bapatla	76418	Bapatla, Karlapalem, PV Palem, Repalle, Cherukupalle, Battiprolu, Nagaram, Nizampatna, Amrathulluru, T Tsundur, Kolluru, Vemuru

2	Guntur	51443	Guntur, Peddakakani, Tenali, Duggirala, Kolliparra, Vatticherukuru, Mangalagir, Ponnuru, Chebrolu and Kakamanu
3	Krishna	44207	Nagayalanka, Avani gadda, Bantumilli, Kruthivennu, Pamidimukkala
4	Nandyal	4390	Kaanala, Pandurangapuram, Nandyala
5	Srikakulam	200	Etcherla, Sarbujili, Srikakulam, Narsannapeta, Gara, Kotabommali, Amdalavalasa
6	Anakapalle	192	Butchaipeta, K.Kotapadu, Deverapalli, Cheedikada, Anakapalle, Munagapaka, Yellamanchili, V. Madugula
7	Tirupati	41	Sattivedu, Vardayapalem
8	Visakhapatnam	34	Padmanabham, Pendurti, Anandapuram
9	Vizainagaram	8	Gorla, Nellimarla
	Total	176933	

Source : ANGRAU DAATTC's and KVK's

Wet Direct Seeding in the state is prevalent in an area of 45,215 ha. during *Kharif* season, mostly in the district of Kakinada. Broadcasting of sprouted paddy seed in the puddled and levelled soil is more widely practiced, compared to sowing with the drum seeder in puddled soils. Further, wet direct seeding is more prevalent during *Rabi* season, compared to *Kharif* season in the state. Wet seeding by broadcasting during *Kharif* season is practiced in an area of 29,338 ha. in Kakinada district; 6,045 ha. in East Godavari; 4,820 ha. in Nellore; 3,572 ha in Konaseema; 408 ha in West Godavari; 179 ha. in Tirupati, 112 ha in Anakapalle, 54 ha. in Vishakhapatnam and 20 ha. in NTR district.

Area under Wet Direct Seeding of Paddy crop by Broadcast in AP

S.No.	District	Area (ha.)	Important Mandals
1	Kakinada	29338	Jaggampeta, Peddapuram, Gollaprolu, Pithapuram
2	East Godavari	6045	Biccavolu, Rangampeta, Anaparthi, Gokavaram, Nidadavolu, Kovvuru and Korukonda
3	Nellore	4820	Indukurpeta and Ananthasagaram
4	Konaseema	3572	Rayavaram, Kapileswarapuram, Alamuru, Ramachandrapuram and K.Gannavaram
5	West Godavari	408	Akiveedu, Tanuku, T.P. Gudem
6	Tirupati	179	Gudur, Naidupeta, Sulurpeta
7	Anakapalle	112	K. Kotapadu, Cheedikada, Munagapaka, Deverapalli
8	Visakhapatnam	54	Padmanabham and Pendurti

9	NTR	20	Penchuganciprolu, Kanchikacerla, Nandigama, Vastavai, Candarlapadu
	Total	44548	

Source : ANGRAU DAATTC's and KVK's

Wet Direct Seeding with drum seeder is practiced in about 667 ha. of the state, mostly in the districts of Nellore (250 ha) and Chittoor (240 ha). The other districts in which the practice is spreading are NTR (100 ha.), Anakapalle (22 ha), Vizainagaram (18 ha), Annamayya (17 ha.), Vishakapatnam (15 ha.) and Kadapa (5 ha.).

Area under Wet Direct Seeding of Paddy crop by Drum Seeder in AP

S.No.	District	Area (ha.)	Important Mandals
1	Vizainagaram	18	Bobbili, Ramabhadrapuram
2	Visakhapatnam	15	Padmanabham and Pendurti
3	Anakapalle	22	K. Kotapadu, Cheedikada, Munagapaka,
4	Nellore	250	Muthukur, Anantasagaram
5	Chittoor	240	Nagiri, Nildra, Vijayapuram, Palasamudram, SR Puram, Penumuru, Irala, Puthalapattu
6	Kadapa	5	Porumamilla, Vallur
7	Annamayya	17	Kalikiri, Vayalpadu, Piler and Rayachoti
8	NTR	100	Penchuganciprolu, Kanchikacerla, Nandigama, Vastavai, Candarlapadu
	Total	667	

Source : ANGRAU DAATTC's and KVK's

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