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## Research Article

### National release – A high yielding, short duration, non – lodging and bold seeded prosomillet variety TNPm 230 as ATL1

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#### Abstract

A high yielding and early maturing prosomillet culture TNPm 230 was developed at the Centre of excellence, Athiyandal, Tamil Nadu Agricultural University and released TNPm 230 as ATL1 at national level. It is a derivative of the cross involving TNAU 164 x IPM 19. It yields on average grain yield of 2152 kg/ha and straw yield of 5970 kg/ha under rainfed condition. This variety has registered 12 and 15 per cent increased grain yield over the checks TNAU145 and GPUP 21 respectively in All India Coordinated trials. Proposed variety has given Eight and 11 per cent increased grain yield over the qualifying varieties TNPm 228 and DHPmV 2721 respectively. TNPm 230 has semi-compact panicle, bold seeds and exhibited better grain quality than the checks; on par for a response to agronomic practices, susceptible to banded blight in AP only. Therefore, the entry **TNPm 230 as ATL1** is recommended for the national level release except in Andhra Pradesh.

#### Keywords

Proso millet new early maturing variety

## INTRODUCTION

A member of sub-family Panicoideae of the family Poaceae, Panivaragu (*Panicum miliaceum*) is widely cultivated as a cereal across the India, Nepal, Western Burma, Sri Lanka, Pakistan and South-East Asian countries. It is grown both in the tropics and sub-tropics and even at an altitude of 2700 feet (Hussain Sahib, 1997). The crop is hardy and provides a reasonable harvest even in degraded soils under unfavourable weather conditions. Nutritionally the grains are comparable or even superior to major cereals. The grain protein is rich in essential amino acids. Prosomillet is a warm-season grass and highly nutritious cereal grain used for human consumption, birdseed, and/or ethanol production. Unique characteristics, such as drought and heat tolerance, make prosomillet a promising alternative cash crop (Haider, 1997). There is a need to develop the prosomillet varieties

adapted to dryland farming regions of India could give growers a much-needed option for diversifying their predominantly under cropping systems. With this objectivity the breeding work was initiated and a new high yielding variety TNPm 230 as ATL 1 was developed to increase the production and productivity of prosomillet in Tamil Nadu and India where panivaragu is grown predominantly under double-cropped rainfed situation.

## MATERIALS AND METHODS

The prosomillet culture TNPm 230 was evolved at Centre of excellence, Athiyandal, Tamil Nadu Agricultural University and released as ATL 1. The cross was made between TNAU 164 x IPM 19. Elite plants with desirable characters which contribute towards high grain yield were selected from F<sub>2</sub> generation onwards. They were

evaluated for their sustained performance, homozygosity and the culture TNPM 230 was identified as the best. The culture was evaluated from 2013-2015 under Coordinated Varietal Trials. TNPM 230 was evaluated under different trials *viz.*, station trials, Multi-Location Trials and On-farm trials during 2011-2013. Besides the reaction of the culture against important pests and diseases were also screened. Based on the standard procedures the grain qualities and its acceptability were also analyzed.

## RESULTS AND DISCUSSION

The overall performance of the Proso millet culture TNPM 230 in coordinated trials was presented in Table 1. Coordinated trials were conducted from *Kharif* 2013 to

*Kharif* 2015. This variety has registered 12, 15 and 8 per cent increased grain yield over the checks TNAU145, GPUP 21 and TNAU151 respectively in All India Coordinated trials. Proposed variety has given Eight and 11 per cent increased grain yield over the qualifying varieties TNPM 228 and DHPMV 2721 respectively. This culture ranked second under All India trials during 2013-14 and placed the third rank during 2014-15 (Table 1).

Centre wise and year wise performance of proso millet culture TNPM 230 was presented in Table 2. Totally four states were under testing *viz.*, Andhra Pradesh, Bihar, Karnataka and Tamil Nadu. Under Andhra Pradesh and Tamil Nadu. This culture performed well with the weighted mean of 22.83 and 25.59 (Table 2)

**Table 1. Summary yield data of Coordinated Varietal Trials (2013-15) Proso millet, CEM, Athiyandal**

Name of proposed variety: TNPM230			Adaptability Zone: National Production conditions: Rainfed					
	Year of testing	No. of trials/ locations	Proposed Variety TNPM230	National Check TNAU145	Zonal Check GPUP21	Latest released Check TNAU151	Qual. Var. 1 TNPM228	Qual. Var.2 DHPMV2721
Mean yield (Q/ha)	2013-14	6	22.55	18.18	16.59	-	18.26	19.55
	2014-15	6	23.34	20.67	20.61	20.34	21.15	21.37
a) Zonal	2015-16	6	18.67	18.63	19.63	18.30	20.89	17.43
b) across Zones (If applicable)	<b>Weighted Mean</b>	<b>Total of 18</b>	<b>21.52</b>	<b>19.16</b> (12.32%)	<b>18.94</b> (13.62%)	<b>19.32</b> (11.39%)	<b>20.10</b> (7.06%)	<b>19.45</b> (10.64%)
Percentage increase or decrease over the checks & qualifying varieties	2013-14	6		24.04	35.93	-	23.49	15.35
	2014-15	6		12.92	13.25	14.75	10.35	9.22
	2015-16	6		0.2	-4.89	2.02	-10.63	7.11
	<b>Weighted mean</b>	<b>Total of 18</b>		<b>12.39</b>	<b>14.76</b>	<b>8.37</b>	<b>7.74</b>	<b>10.56</b>
Frequency in the top three groups (pooled for three years)	2013-14	6	2	1	-	-	1	-
	2014-15	6	1	-	1	-	1	-
	2015-16	6	2	1	1	1	2	-
	<b>Pooled</b>	<b>Total of 18</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>-</b>
<b>All India Rank</b>	2013-14(14)		2	11	12	-	10	5
	2014-15(18)		3	14	13	15	10	8
	2015-16(10)		7	8	4	9	2	10

### Note:

1. Qualifying variety is one which has completed three years of testing in coordinated trials
2. Centre- wise and year -wise data must be appended, otherwise proposal will not be considered

State trials were conducted during *Kharif* 2011-13, the culture recorded a mean grain yield of 2583 kg/ha with 16% increase over TNAU 145 and 19% over CO(PV) 5 and mean straw yield of 3108 kg/ha which is 8% over TNAU 145 and CO (PV) 5 (Table 3, Fig.1). The performance of yield contributing traits was presented in Table 4. The profusely tillering and non-lodging culture is highly suitable for drylands of India. The panicle is large, semi-compact and branched. Proso millet culture TNPM 230 recorded less incidence of leaf spot, Rust

and Leaf blight incidence when compared with the National check varieties GPUP21 and TNAU 151 and Qualifying varieties TNPM 228 and DHPMV2721. (Table 5).

Proso millet culture TNPM 230 recorded less dead heart symptom due to shoot fly incidence and tolerant to shoot fly incidence when compared with the check varieties National check varieties GPUP21 and TNAU 151 and Qualifying varieties TNPM 228 and DHPMV2721. (Table 6).

Table 2. Centre- wise and Year -wise data of Proso millet (Grain Yield q/ha)

State	Centres	Year	Proposed Variety TNPm230	Checks			Qualifying varieties	
				TNAU 145	GPUP 21	TNAU 151	TNPm228	DHPmV2 721
Andhra Pradesh	Nandyal	2013-14	20.37	8.46 (140.78)	9.20 (121.41)	-	10.74 (89.66)	15.12 (34.72)
		2014-15	31.11	20.99 (48.21)	31.85 (-2.32)	16.05 (93.83)	21.36 (45.65)	23.70 (31.27)
		2015-16	34.26	24.07 (34.65)	32.48 (5.48)	26.54 (29.09)	32.41(5.71)	31.79 (7.77)
		<b>Mean</b>	<b>28.58</b>	<b>17.84 (60.20)</b>	<b>24.51 (16.61)</b>	<b>21.30 (34.18)</b>	<b>21.50 (32.93)</b>	<b>23.54 (21.41)</b>
	Guntur	2013-14	-	-	-	-	-	-
		2014-15	-	-	-	-	-	-
		2015-16	5.56	2.95 (88.47)	6.5 (-14.59)	2.36 (135.60)	6.64 (-16.27)	5.83 (-4.63)
		<b>Mean</b>	<b>5.56</b>	<b>2.95 (88.47)</b>	<b>6.5 (-14.59)</b>	<b>2.36 (135.60)</b>	<b>6.64 (-16.27)</b>	<b>5.83 (-4.63)</b>
	<b>Mean</b>	2013-14	20.37	8.46 (140.78)	9.20 (121.41)	-	10.74 (89.66)	15.12 (34.72)
		2014-15	31.11	20.99 (48.21)	31.85 (-2.32)	16.05 (93.83)	21.36 (45.65)	23.70 (31.27)
		2015-16	19.91	13.51 (47.38)	19.50 (2.10)	14.45 (37.79)	19.53 (1.95)	18.18 (5.85)
		<b>State Mean</b>	<b>23.80</b>	<b>14.32 (66.20)</b>	<b>20.18 (17.94)</b>	<b>15.25 (56.06)</b>	<b>17.21 (38.29)</b>	<b>19.21 (23.89)</b>
	<b>Weighted state mean</b>		<b>22.83</b>	<b>14.12 (61.69)</b>	<b>20.01 (14.09)</b>	<b>14.98 (52.40)</b>	<b>14.23 (60.44)</b>	<b>19.11 (19.47)</b>
	Bihar	Dholi	2013-14	-	-	-	-	-
			2014-15	-	-	-	-	-
<b>Mean</b>			<b>8.33</b>	<b>9.26 (-10.04)</b>	<b>6.33 (31.60)</b>	<b>8.80 (-5.34)</b>	<b>15.28 (-45.48)</b>	<b>5.86 (42.15)</b>
<b>State mean</b>		<b>8.33</b>	<b>9.26 (-10.04)</b>	<b>6.33 (31.60)</b>	<b>8.80 (-5.34)</b>	<b>15.28 (-45.48)</b>	<b>5.86 (42.15)</b>	
		2013-14	16.56	6.83 (142.46)	16.00 (3.50)	-	14.37 (15.24)	18.31 (-9.56)
		2014-15	29.38	29.14 (0.82)	28.05 (4.74)	31.95 (-8.04)	28.99 (1.35)	31.21 (-5.86)
Bangalore	2015-16	26.60	35.69 (-25.47)	25.39 (4.77)	33.15 (-9.76)	24.16 (10.10)	25.99 (-3.93)	
	<b>Mean</b>	<b>24.18</b>	<b>23.89 (1.21)</b>	<b>23.15 (4.45)</b>	<b>33.55 (-27.93)</b>	<b>22.51 (7.42)</b>	<b>25.17 (-3.93)</b>	
	2013-14	21.93	12.64 (73.50)	14.91 (47.08)	-	22.47 (-2.40)	14.91 (47.08)	
Karnataka	Hagari	2014-15	18.12	7.80 (132.31)	6.42 (182.24)	11.06 (63.83)	9.78 (85.28)	15.28 (18.59)
		2015-16	8.76	18.67 (-53.08)	16.92 (-48.23)	13.58 (-35.49)	20.74 (-57.76)	9.92 (-11.69)
		<b>Mean</b>	<b>16.27</b>	<b>13.04 (24.25)</b>	<b>12.75 (27.69)</b>	<b>12.32 (32.14)</b>	<b>17.66 (-7.81)</b>	<b>13.37 (21.77)</b>
	Hanumana-matti	2013-14	30.15	26.33 (14.51)	23.96 (25.83)	-	27.95 (7.87)	27.66 (9.00)
2014-15		25.98	29.57 (-12.14)	21.18 (22.66)	23.03 (12.81)	20.43 (27.17)	21.47 (26.01)	
<b>Mean</b>		<b>28.07</b>	<b>27.95 (0.43)</b>	<b>22.57 (24.37)</b>	<b>23.03 (21.88)</b>	<b>24.19 (0.43)</b>	<b>24.57 (14.25)</b>	
<b>State mean</b>	2013-14	17.42	15.27 (14.08)	18.29 (-4.76)	-	21.60 (-19.35)	20.29 (-14.14)	
	2014-15	24.49	22.17 (10.46)	18.55 (32.02)	22.01 (11.27)	19.73 (24.13)	22.65 (8.12)	
	2015-16	17.68	27.18 (-34.95)	21.16 (-16.46)	23.37 (-24.35)	22.45 (-21.25)	17.96 (-1.56)	
	<b>Weighted state mean</b>	<b>19.86</b>	<b>21.54 (-7.8)</b>	<b>19.33 (2.74)</b>	<b>22.69 (-12.47)</b>	<b>21.26 (-6.59)</b>	<b>20.30 (-2.17)</b>	
<b>Weighted state mean</b>		<b>22.19</b>	<b>20.83 (6.53)</b>	<b>19.10 (16.18)</b>	<b>22.55 (-1.60)</b>	<b>21.11 (5.12)</b>	<b>20.59 (7.77)</b>	
Tamil Nadu	Coimbatore	2013-14	22.68	29.24 (-22.44)	19.10 (18.74)	-	13.26 (71.04)	18.13 (25.1)
		2014-15	26.25	35.22 (-25.47)	26.58 (-1.24)	32.55 (-19.35)	36.94 (-28.94)	31.58 (-16.88)
		<b>Mean</b>	<b>24.47</b>	<b>32.23 (-24.08)</b>	<b>22.84 (7.14)</b>	<b>32.55 (-24.82)</b>	<b>25.10 (-2.51)</b>	<b>24.86 (-1.57)</b>
	Pudukottai	2013-14	23.58	25.58 (-7.92)	22.11 (6.65)	-	20.78 (13.47)	23.17 (1.77)
		2014-15	-	-	-	-	-	-
		<b>Mean</b>	<b>23.58</b>	<b>25.58 (-7.92)</b>	<b>22.11 (6.65)</b>	<b>-</b>	<b>20.78 (13.47)</b>	<b>23.17 (1.77)</b>
	Athiyandal	2013-14	-	-	-	-	-	-
		2014-15	26.89	16.30 (64.97)	25.79 (4.27)	22.74 (18.25)	23.32 (15.31)	19.94 (34.85)
		2015-16	28.53	21.12 (35.09)	30.21 (-5.56)	25.41 (12.28)	26.12 (9.23)	25.2 (13.17)
		<b>Mean</b>	<b>27.71</b>	<b>18.71 (48.10)</b>	<b>28.00 (-1.04)</b>	<b>24.08 (15.07)</b>	<b>24.72 (12.10)</b>	<b>22.58 (22.72)</b>
<b>State Mean</b>	2013-14	23.13	27.41 (-15.61)	20.61 (12.23)	-	23.13 (0.0)	20.65 (12.01)	
	2014-15	26.57	25.76 (3.14)	26.19 (1.45)	27.65 (-3.91)	30.13 (-11.82)	25.76 (3.10)	
	2015-16	28.53	21.12 (35.09)	30.21 (-5.56)	25.41 (12.28)	26.12 (9.23)	25.21 (13.17)	
	<b>State Mean</b>	<b>26.08</b>	<b>24.76 (5.33)</b>	<b>25.67 (1.60)</b>	<b>16.53 (-1.70)</b>	<b>26.46 (-1.44)</b>	<b>23.87 (9.26)</b>	

Table 3. Performance of prosomillet variety TNPm 230 in state trials (2011-2013)

Sl. No	Name of the trial	No. of trials	Grain yield (kg/ha)				Straw yield (kg/ha)			
			TNPm 230	TNPm 228	TNAU 145	CO (PV) 5	TNPm 230	TNPm 228	TNAU 145	CO (PV) 5
1	Station trials	4	2870	2743	2430	2313	3208	3020	3003	2997
2	Multi-Location Trial	2	2365	2246	2054	1937	3006	2980	2898	2620
3	On-farm trials	2	2227	2320	2003	2101	3010	2795	2617	2810
	<b>Total no. of trials/Mean</b>	<b>8</b>	<b>2583</b>	<b>2513</b>	<b>2229</b>	<b>2166</b>	<b>3108</b>	<b>2954</b>	<b>2880</b>	<b>2856</b>
	<b>Per cent increase over</b>			<b>2.79</b>	<b>15.87</b>	<b>19.25</b>		<b>5.22</b>	<b>7.91</b>	<b>8.82</b>

Table 4. Performance of yield contributing traits

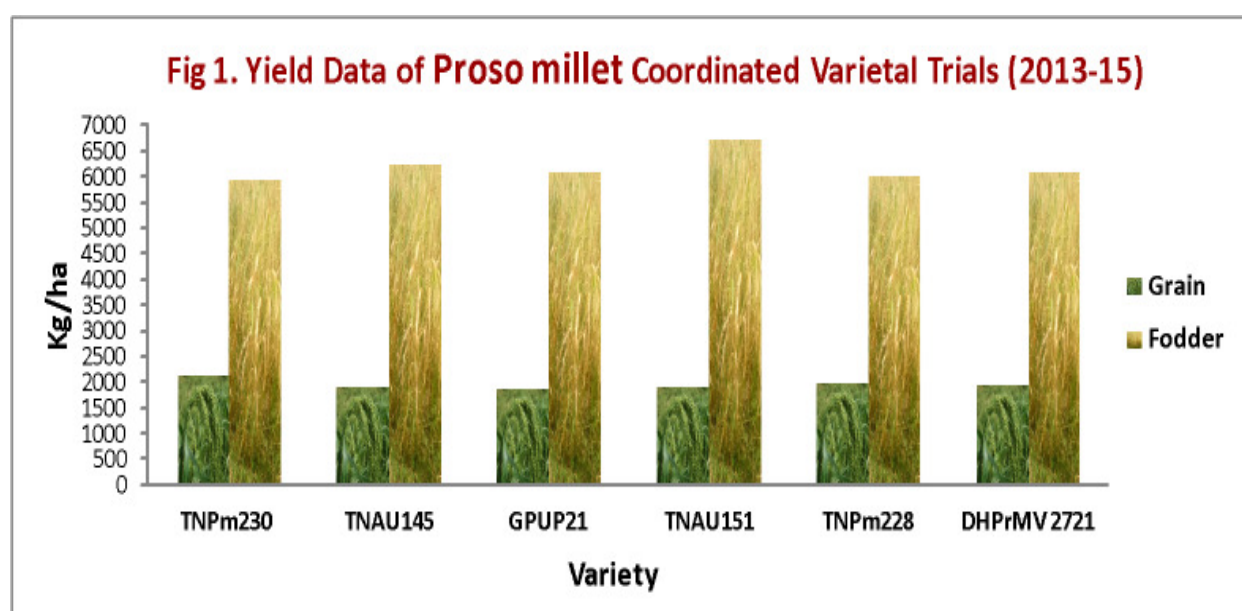
S.No.	Name of proposed variety: TNPm230		Adaptability Zone: National Production condition: Rainfed							
			Characters	Year	Proposed Variety		National Checks		Qualifying varieties	
					TNPm230	TNAU 145	GPUP 21	TNAU 151	TNPm228	DHPmV2721
1.	Plant height(cm)	2013-14	78.40	99.50	84.40	-	77.90	82.90		
		2014-15	88.50	110.20	99.10	106.50	92.30	92.10		
		2015-16	97.00	137.90	104.80	123.40	96.00	101.40		
		<b>State Mean</b>	87.97	115.87	96.10	114.95	88.73	92.15		
2.	Number of productive tillers	2013-14	6	6	5	-	6	6		
		2014-15	6	5	5	5	6	6		
		2015-16	5	5	5	3	5	5		
		<b>State Mean</b>	5.67	5.33	5	4	5.67	5.67		
3.	Days to 50% flowering	2013-14	35	39	38	-	27	37		
		2014-15	38	43	40	41	39	39		
		2015-16	37	43	41	44	39	39		
		<b>State Mean</b>	36.67	41.67	39.67	42.50	38.33	38.33		
4.	Days to maturity	2013-14	72	77	75	-	74	74		
		2014-15	74	77	77	76	74	74		
		2015-16	73	76	76	77	76	75		
		<b>State Mean</b>	73	76.67	76	76.5	74.67	74.33		
5.	1000 grain weight(g)	2013-14	-	-	-	-	-	-		
		2014-15	-	-	-	-	-	-		
		2015-16	5.77	5.6	5.35	-	5.62	5.53		
		<b>State Mean</b>	<b>5.77</b>	<b>5.6</b>	<b>5.35</b>	-	<b>5.62</b>	<b>5.53</b>		
6.	Fodder yield (t/ha)	2013-14	5.10	5.40	4.70	-	5.20	5.20		
		2014-15	5.90	5.80	6.40	5.70	5.90	6.10		
		2015-16	6.90	7.50	7.20	7.80	7.00	7.00		
		<b>State Mean</b>	<b>5.97</b>	<b>6.23</b>	<b>6.10</b>	<b>6.75</b>	<b>6.03</b>	<b>6.10</b>		
7.	Harvest index (%)	2013-14	-	-	-	-	-	-		
		2014-15	-	-	-	-	-	-		
		2015-16	53.57	58.17	58	-	63.13	57.71		
		<b>State Mean</b>	<b>53.57</b>	<b>58.17</b>	<b>58</b>	-	<b>63.13</b>	<b>57.71</b>		

Table 5. Reaction to major diseases

Name of proposed variety: TNPm230				Adaptability Zone: National				
Disease name	Screening condition	Year	Proposed Variety	Production condition: Rainfed				
				National Checks		Qualifying Varieties		
			TNPm230	TNAU145	GPUP21	TNAU151	TNPm228	DHPmV 2721
Leaf Spot(0-5)	Natural	2013-14	1.5	2.2	1.5	-	2.0	2.7
		2014-15	1.8	1.5	1.8	1.7	1.7	1.5
		2015-16	1.2	1.0	1.8	1.7	1.0	1.2
	<b>Mean</b>		<b>1.5</b>	<b>1.57</b>	<b>1.7</b>	<b>1.7</b>	<b>1.57</b>	<b>1.8</b>
Rust(G)	Natural	2013-14	0.0	0.0	0.7	-	0.0	0.0
		2014-15	0.0	0.0	0.3	0.3	0.3	0.0
		2015-16	0.0	0.0	0.0	0.0	0.0	0.3
	<b>Mean</b>		<b>0</b>	<b>0</b>	<b>0.33</b>	<b>0.15</b>	<b>0.1</b>	<b>0.1</b>
Leaf blight(G)	Natural	2013-14	3.0	4.0	3.0	-	4.0	5.0
		2014-15	3.3	3.0	3.7	3.3	3.0	2.3
		2015-16	2.0	2.0	3.0	3.0	2.0	2.0
	<b>Mean</b>		<b>3.15</b>	<b>3.15</b>	<b>3.15</b>	<b>3.15</b>	<b>3.15</b>	<b>3.15</b>
Banded Blight(%)		2014-15	46.2	42.2	47.5	40.3	40.9	37.2
		2015-16	14.7	16.6	20.9	13.7	18.9	25.4
	<b>Mean</b>		<b>30.45</b>	<b>29.4</b>	<b>34.2</b>	<b>27</b>	<b>29.9</b>	<b>31.3</b>

Table 6. Reaction to insect pests

Name of proposed variety: TNPm230				Adaptability Zone: National				
Insect name	Screening condition	Year	Proposed Variety	Production condition: Rainfed				
				National Checks		Qualifying Varieties		
			TNPm230	TNAU145	GPUP21	TNAU151	TNPm228	DHPm V2721
Shoot fly(% incidence)	Natural	2013-14	19.67	49.27	63.1	-	30.57	12.5
		2014-15	56	59.6	39.1	60.75	55	55.2
		2015-16	12.8	16.9	11.0	18.0	23.5	8.75
	<b>Mean</b>		<b>29.49</b>	<b>41.92</b>	<b>37.73</b>	<b>39.38</b>	<b>36.36</b>	<b>25.48</b>





**Table 7. Grain quality characteristics of proposed variety TNPm 230, qualifying varieties TNPm 228, national checks GPUP 21 and TNAU 145.**

S. No	Quality characteristics	Proposed variety (TNPm 230)	Qualifying variety (TNPm 228)	Check 1 (GPUP 21)	Check 2 TNAU 145
<b>Parameters</b>					
<b>a) Nutritional Quality</b>					
1.	Protein ( g/100g)	<b>12.9</b>	12.7	12.5	12.8
2.	Carbohydrate(g /100g)	<b>70.4</b>	71.5	71.7	72.3
3.	Oil (g/100g)	<b>3.3</b>	3.3	3.4	3.6
4.	Crude fiber (g/100g)	<b>7.5</b>	7.7	7.3	7.1
5.	Mineral matter (g/100g)	<b>2.7</b>	2.4	2.1	2.3
9.	Potassium (g/100g)	<b>2.2</b>	2.0	1.8	2.0
7.	Phosphorus (mg/100g)	<b>210</b>	208	205.0	209.0
8.	Calcium (mg/100g)	<b>17.1</b>	16.4	15.6	16.5
9.	Iron (mg/100g)	<b>11.6</b>	11.0	11.2	11.3
10.	□-carotene (□g/g)	<b>127</b>	119	110.0	115
11.	1000 grain weight (g)	<b>5.89</b>	5.70	3.3	3.6
12.	1000 grain volume (ml)	<b>7.0</b>	6.0	4.2	4.3
<b>b) Cooking qualities</b>					
1.	Water uptake (ml)	<b>963</b>	958	945	950
2.	Cooking time (min)	<b>25</b>	28	26	27
3.	Initial Volume (ml)	<b>114</b>	112	100	100
4.	Cooked volume (ml)	<b>796</b>	786	710	740
5.	Initial weight (g)	<b>100</b>	100	100	100
6.	Cooked weight (g)	<b>786</b>	772	700	725
<b>c) Sensory evaluation score (1-10 score)9.0</b>					
1.	Colour& appearance	<b>9.5</b>	9.0	8.0	9.0
2.	Flavour	<b>9.5</b>	9.0	8.5	9.0
3.	Texture	<b>10.0</b>	9.5	8.0	9.0
4.	Taste	<b>9.5</b>	9.0	8.5	9.0
<b>d) Fodder Characteristics</b>					
1	Dry matter (%)	<b>23.81</b>	22.4	20.56	21.43
2	Crude protein (%)	<b>7.97</b>	7.08	6.95	7.02
3	Crude fibre (%)	<b>18.16</b>	19.32	20.68	19.53
4	Potassium (%)	<b>2.87</b>	2.70	3.10	2.95
5	Phosphorus (%)	<b>0.20</b>	0.16	0.15	0.18
6	Mineral matter (%)	<b>2.31</b>	2.27	2.00	2.15

\* Regarding grain quality characteristics, prosomillet culture TNPm 230 excels the check varieties GPUP 21 and TNAU 145 and Qual.variety TNPm 228. TNAU 230 was found to be the best during cooking and sensory evaluation.

**Fig. 2. Field view of TNPm 230 as ATL 1**



The grain of TNPm 230 as ATL 1

Regarding grain quality characteristics, prosomillet culture TNPm 230 excels the check varieties GPUP 21 and TNAU 145 and variety TNPm 228. TNAU 230 was found to be the best during cooking and sensory evaluation (Table 7). Grains are also nutritionally superior and bold and golden yellow in colour.

The proposed Prosomillet culture TNPm 228 has semi-compact and large panicle, Oblong shaped bold grains, Golden yellow grains and tolerant to shoot - flyincident. It

is drought tolerant. It is endured with special attributes like easy threshability, synchronized maturity and non-lodging growth habit.

In view of stable yield performance across seasons and locations and special attributes, with drought tolerance, the Prosomillet culture TNPm 228 is recommended for National release by CVRC during 2018, TNPm 228 as ATL 1 to ensure the nutritional security of small farmers in All India level.

## REFERENCES

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