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title: “PEOP Data”

output: pdf\_document: includes: in\_header: “preamble.tex” html\_document: default —

We have a questionnaire and are looking at basic info (district, tehsil, psu, settlement name, neighborhood and hh id), as well as their assets, consumption, and crop sales.

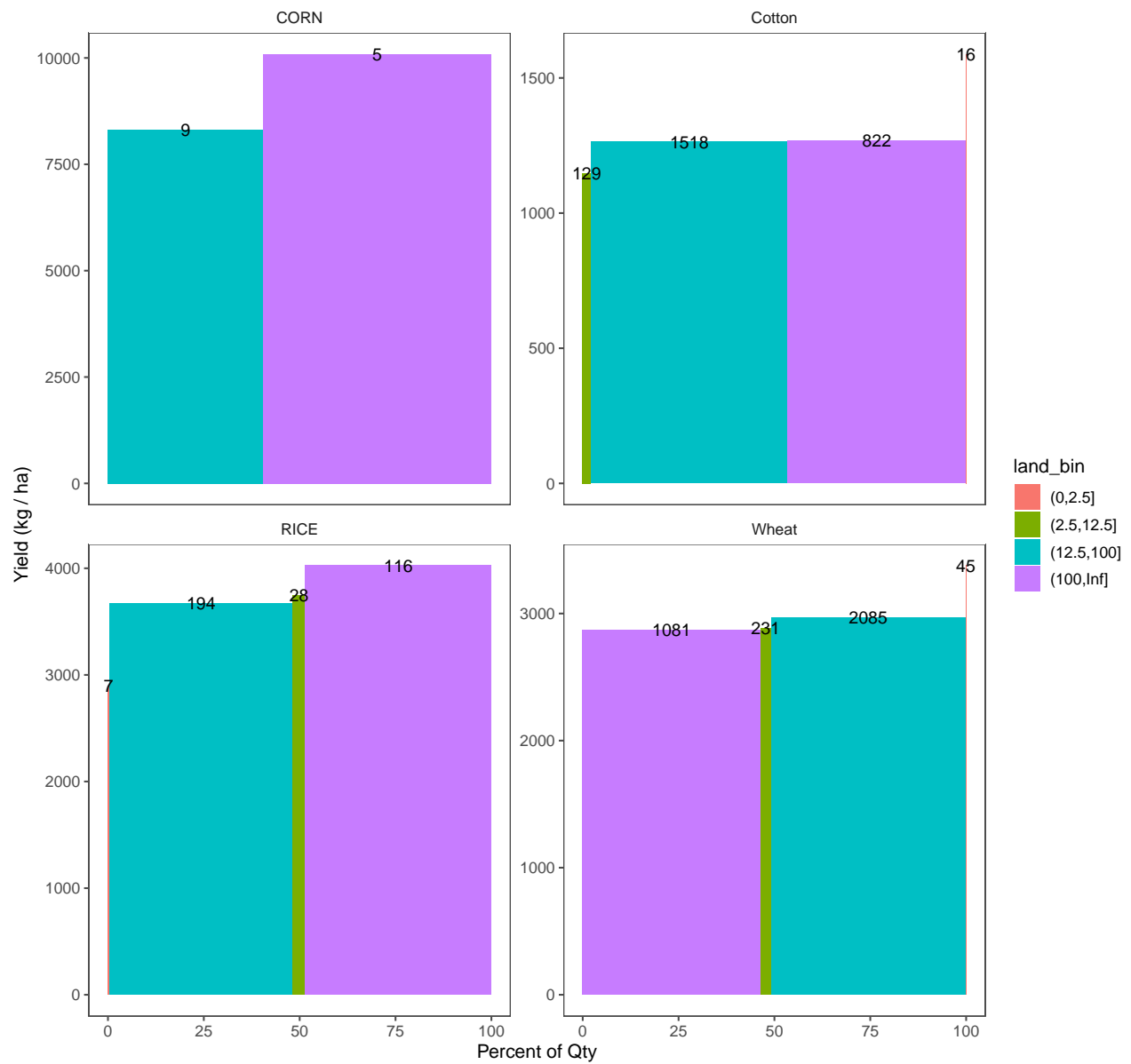
Resisting the other datasets for now.

```
## # A tibble: 3,442 x 5
##   hh_id crop_type land_cultvd qty_prod yield
##   <dbl> <chr>      <dbl>    <dbl> <dbl>
## 1    25 Wheat        1.82  74648. 40991.
## 2   128 Wheat        0.607 24261. 39966.
## 3   224 Wheat        0.101  3919. 38737.
## 4   157 Wheat        0.708 22581. 31885.
## 5   249 Wheat        4.05 119437. 29514.
## 6   236 Wheat        0.101  2799. 27669.
## 7     3 Wheat        2.02 46655. 23058.
## 8   220 Wheat        0.152  3359. 22135.
## 9     4 Wheat        0.202  3732. 18446.
## 10  149 Wheat        0.506  6569. 12986.
## # ... with 3,432 more rows
```

crop_type	land_bin	hh	land	qty	yield
BAJRA	(12.5,100]	1	0.405	447.890	1106.760
BAJRA	(100,Inf]	2	0.304	9704.292	31973.075
BRASICA	(12.5,100]	1	0.202	186.621	922.300
CHANY	(12.5,100]	1	0.809	373.242	461.150
CHARI	(12.5,100]	1	5.666	29859.360	5270.287
CORN	(12.5,100]	9	8.802	73155.432	8311.303
CORN	(100,Inf]	5	12.950	130634.700	10087.659
Cotton	(0,2.5]	16	3.996	6345.114	1587.757
Cotton	(2.5,12.5]	129	98.743	113390.920	1148.339
Cotton	(12.5,100]	1518	2427.256	3068198.537	1264.061
Cotton	(100,Inf]	822	2191.274	2778488.096	1267.979
DHAN	(12.5,100]	1	0.708	2239.452	3162.172
Fodder (Kharif)	(0,2.5]	44	8.397	491485.066	58529.396
Fodder (Kharif)	(2.5,12.5]	222	53.368	3247727.939	60855.381
Fodder (Kharif)	(12.5,100]	1828	558.113	31841498.965	57052.108
Fodder (Kharif)	(100,Inf]	917	353.696	20307649.330	57415.618
Fodder (Kharif) Bajhra	(12.5,100]	1	0.405	11197.260	27669.008
Fodder (Kharif) BAJRA	(100,Inf]	1	0.405	5598.630	13834.504
Fodder (Rabi)	(0,2.5]	50	8.954	539819.905	60290.299
Fodder (Rabi)	(2.5,12.5]	214	46.286	2947305.453	63676.013
Fodder (Rabi)	(12.5,100]	1870	536.917	31312204.485	58318.503
Fodder (Rabi)	(100,Inf]	932	345.551	20107106.403	58188.491
Fodder (Rabi) Losan	(12.5,100]	1	0.405	10450.776	25824.407
FRUITE	(12.5,100]	1	0.051	186.621	3689.201
GAWARA	(2.5,12.5]	1	1.518	1866.210	1229.734
GAWARA	(100,Inf]	1	0.202	2239.452	11067.603
GUAWA	(12.5,100]	1	1.214	335917.800	276690.076
GUAWA	(100,Inf]	1	1.619	29859.360	18446.005
JAWAR	(12.5,100]	1	0.101	6718.356	66405.618

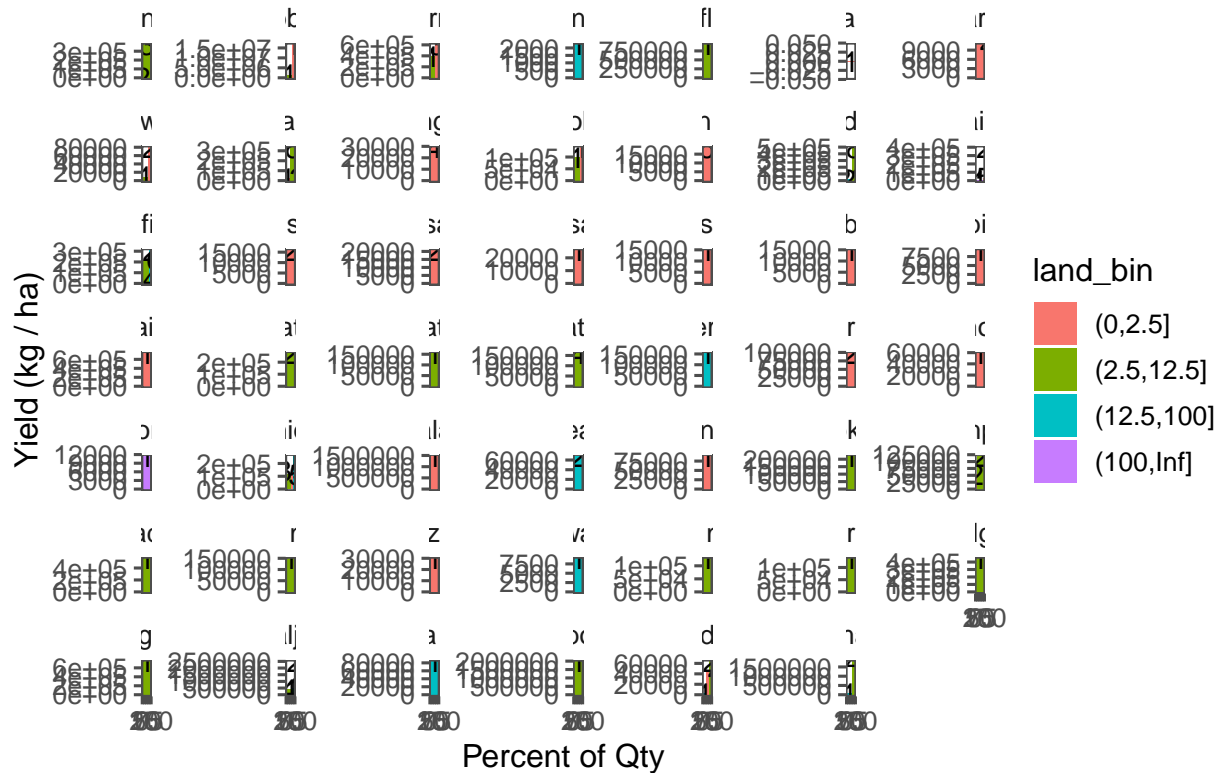
crop_type	land_bin	hh	land	qty	yield
KORIA	(12.5,100]	1	0.101	2239.452	22135.206
MANGO	(0,2.5]	1	0.607	5598.630	9223.003
MANGO	(2.5,12.5]	5	2.226	25455.104	11436.523
MANGO	(12.5,100]	8	4.755	34524.885	7260.662
MANGO	(100,Inf]	1	0.405	4665.525	11528.753
MONG	(2.5,12.5]	1	0.202	74.648	368.920
MONG	(12.5,100]	20	20.690	8920.484	431.158
MONG	(100,Inf]	11	31.414	46505.953	1480.433
MUSTARD	(12.5,100]	1	1.214	2351.425	1936.831
PEARS	(100,Inf]	1	0.202	186.621	922.300
RAYA	(12.5,100]	2	0.809	746.484	922.300
RAYA	(100,Inf]	3	3.237	3919.041	1210.519
RICE	(0,2.5]	7	2.074	6009.196	2897.373
RICE	(2.5,12.5]	28	17.857	66884.966	3745.636
RICE	(12.5,100]	194	254.851	935643.046	3671.334
RICE	(100,Inf]	116	258.493	1040486.723	4025.200
SARSO	(2.5,12.5]	1	0.809	746.484	922.300
SARSO	(12.5,100]	18	12.849	17131.808	1333.341
SARSO	(100,Inf]	9	8.296	9890.913	1192.242
STRAWBERRY	(2.5,12.5]	1	0.809	9331.050	11528.753
STRAWBERRY	(12.5,100]	2	2.023	25380.456	12543.283
STRAWBERRY	(100,Inf]	3	3.642	57479.268	15781.582
SUGARCANE	(2.5,12.5]	12	7.993	473270.856	59214.011
SUGARCANE	(12.5,100]	104	118.522	6575516.287	55479.096
SUGARCANE	(100,Inf]	50	101.121	4425754.339	43766.953
SUN FLOWER	(12.5,100]	4	9.308	13436.712	1443.600
SUN FLOWER	(100,Inf]	1	0.405	1007.753	2490.211
SWEET POTATO	(100,Inf]	1	0.405	298.594	737.840
TIL	(12.5,100]	12	15.125	3657.772	241.834
TIL	(100,Inf]	7	11.938	4590.877	384.552
TOBACCO	(12.5,100]	1	0.152	298.594	1967.574
WATER MELON	(2.5,12.5]	2	3.339	103761.276	31078.724
WATER MELON	(12.5,100]	4	3.743	37622.794	10050.580
Wheat	(0,2.5]	45	12.444	42027.049	3377.269
Wheat	(2.5,12.5]	231	168.703	486632.920	2884.546
Wheat	(12.5,100]	2085	3094.431	9188471.556	2969.357
Wheat	(100,Inf]	1081	2828.957	8125590.313	2872.291
ZEERA	(12.5,100]	1	0.607	410.566	676.354

# Changes in Yield by Type of Farm 2016



Lets recreate for vegetables

## Changes in Yield by Type of Farm



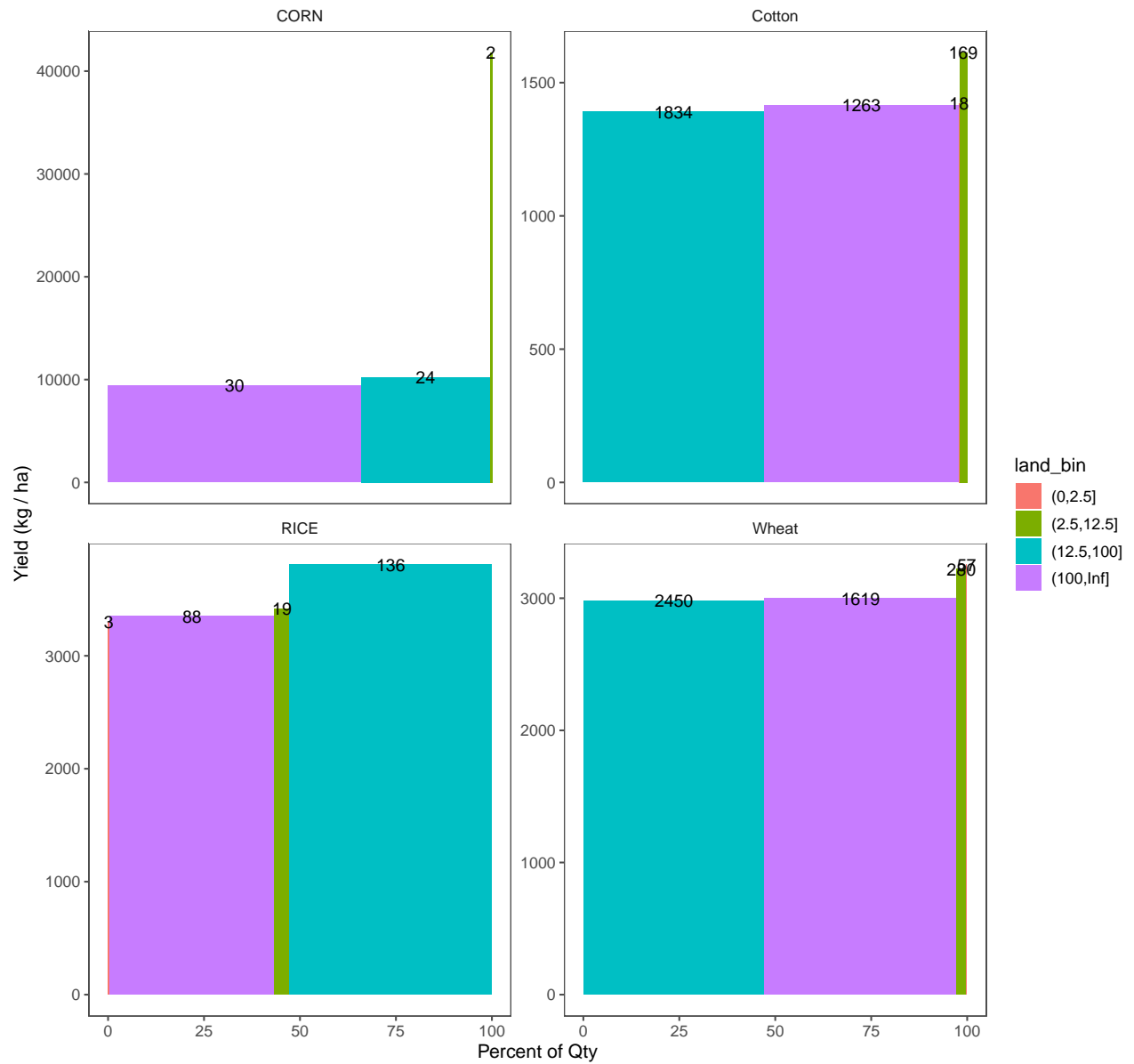
Lets look at 2019 data

crop_type	land_bin	hh	land	qty	yield
AMROD	(12.5,100]	1	2.378	186621.000	78493.639
AMROD KAY BAGH	(100,Inf]	1	2.428	139965.750	57643.766
AMROOD	(100,Inf]	1	0.809	67183.560	83007.023
BAJRA	(12.5,100]	4	3.946	15116.301	3831.093
BALANGO	(12.5,100]	1	0.202	149.297	737.840
BALANGU	(12.5,100]	1	0.202	149.297	737.840
BARSEEM	(0,2.5]	2	0.202	10077.534	49804.214
BARSEEM	(2.5,12.5]	9	2.175	192033.009	88283.438
BARSEEM	(12.5,100]	67	13.456	504473.887	37491.159
BARSEEM	(100,Inf]	25	4.148	204723.237	49354.311
BARSEEN	(2.5,12.5]	1	0.051	746.484	14756.804
BARSEEN	(12.5,100]	1	0.101	11197.260	110676.030
BARSEM	(12.5,100]	2	0.152	8584.566	56567.749
BASRSEEM	(12.5,100]	1	0.101	5598.630	55338.015
CANOLA	(12.5,100]	1	2.023	2799.315	1383.450
CANOLA	(100,Inf]	1	0.405	559.863	1383.450
CHARA	(100,Inf]	1	4.452	16422.648	3689.201
CHAWAL	(0,2.5]	1	0.304	298.594	983.787
CHAWAL	(12.5,100]	5	3.086	13474.036	4366.563
CHAWAL	(100,Inf]	3	7.082	27619.908	3900.012
CORN	(2.5,12.5]	2	0.304	12690.228	41810.945
CORN	(12.5,100]	24	20.740	212561.319	10248.780
CORN	(100,Inf]	30	40.722	383954.045	9428.773
Cotton	(0,2.5]	18	5.008	7128.922	1423.510

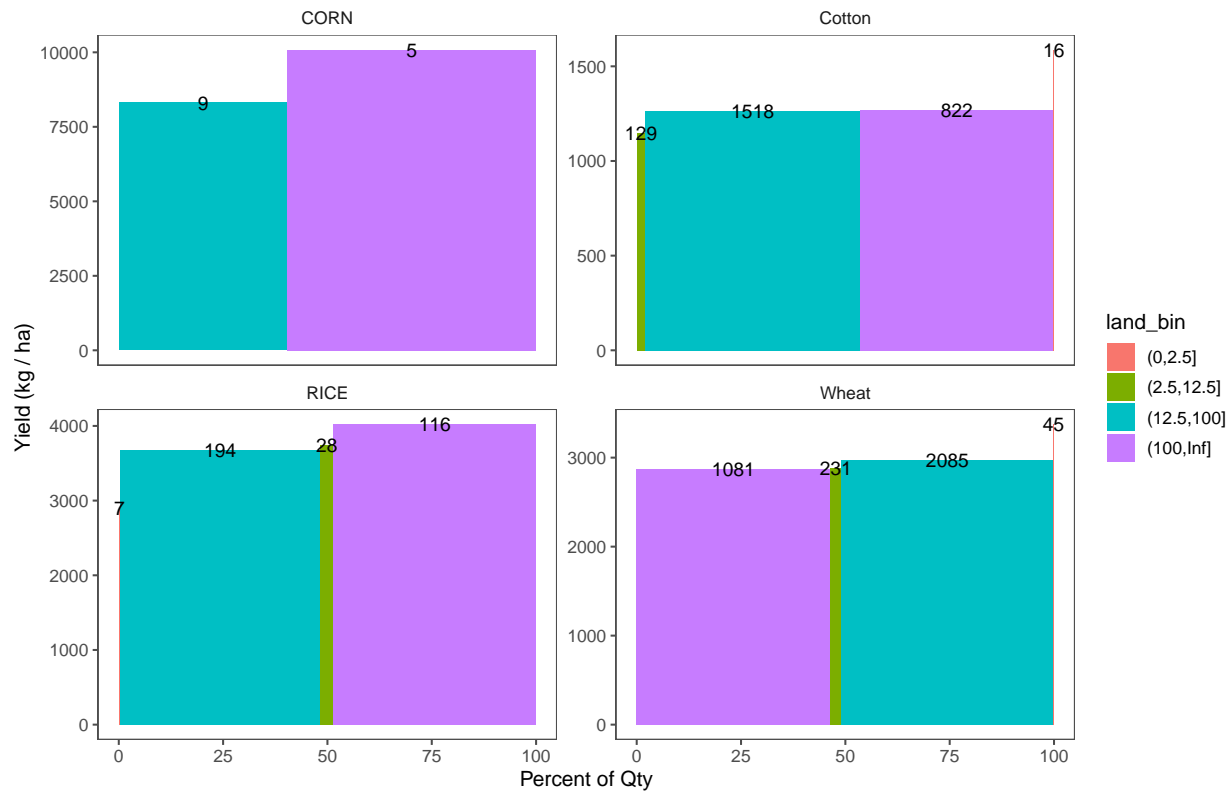
crop_type	land_bin	hh	land	qty	yield
Cotton	(2.5,12.5]	169	116.044	187180.863	1613.020
Cotton	(12.5,100]	1834	2688.633	3739660.895	1390.916
Cotton	(100,Inf]	1263	2905.848	4110887.388	1414.695
DAHAN	(12.5,100]	13	12.039	44229.177	3673.700
DAHAN	(100,Inf]	7	24.484	57665.889	2355.296
DAYA	(12.5,100]	1	0.405	634.511	1567.910
DAYA	(100,Inf]	1	0.405	933.105	2305.751
DHAAN	(2.5,12.5]	1	0.202	746.484	3689.201
DHAAN	(12.5,100]	11	13.001	51171.478	3936.105
DHAAN	(100,Inf]	8	11.331	45348.903	4002.124
DHAN	(2.5,12.5]	5	4.148	10488.100	2528.452
DHAN	(12.5,100]	32	40.317	157508.124	3906.757
DHAN	(100,Inf]	18	35.157	131269.211	3733.790
Feed	(0,2.5]	119	19.374	750515.014	38737.574
Feed	(2.5,12.5]	370	87.867	3572597.776	40658.946
Feed	(12.5,100]	2760	824.194	34990205.801	42453.866
Feed	(100,Inf]	1694	641.478	28554170.050	44513.101
FLOWER	(12.5,100]	1	0.405	1679.589	4150.351
FODDER	(2.5,12.5]	1	0.101	5598.630	55338.015
FODDER	(12.5,100]	2	0.506	14929.680	29513.608
FODDER , BARSEEM	(100,Inf]	1	0.101	5971.872	59027.216
FODDER LOSAN	(12.5,100]	4	0.455	21237.470	46647.897
FOOD	(12.5,100]	1	0.809	16795.890	20751.756
GANA	(12.5,100]	2	0.506	29859.360	59027.216
GANAH	(12.5,100]	4	2.023	92937.258	45930.553
GANNA	(12.5,100]	7	7.588	405900.675	53493.415
GANNA	(100,Inf]	6	5.261	183560.416	34891.328
GOWARA	(100,Inf]	1	2.630	0.000	0.000
GRAPES	(12.5,100]	1	0.101	261.269	2582.441
JANTAR	(12.5,100]	1	0.405	13436.712	33202.809
JANTAR	(100,Inf]	2	2.630	26126.940	9932.464
JO	(12.5,100]	1	0.405	11197.260	27669.008
KAMAAD	(12.5,100]	1	0.809	0.000	0.000
KAMAAD	(100,Inf]	1	0.809	7464.840	9223.003
KAMAD	(12.5,100]	8	17.503	1869195.936	106794.906
KAMAD	(100,Inf]	5	6.627	462820.080	69841.363
KUMAD	(12.5,100]	1	5.666	313523.280	55338.015
KUMAD	(100,Inf]	5	9.712	746484.000	76858.354
LOSAN	(0,2.5]	2	0.202	4665.525	23057.506
LOSAN	(2.5,12.5]	1	0.101	1492.968	14756.804
LOSAN	(12.5,100]	28	5.514	199311.228	36147.401
LOSAN	(100,Inf]	3	0.253	13063.470	51648.814
LOSANI CHARA	(12.5,100]	1	0.152	2612.694	17216.271
LOSON	(100,Inf]	1	0.202	2985.936	14756.804
LOSUN	(2.5,12.5]	1	0.051	933.105	18446.005
MAIZE	(2.5,12.5]	1	0.202	7464.840	36892.010
MAIZE	(100,Inf]	2	1.922	5598.630	2912.527
MAIZE FODDER	(12.5,100]	1	0.202	1866.210	9223.003
MAKAI, BARSEM	(12.5,100]	1	4.047	134367.120	33202.809
MANGI	(12.5,100]	1	0.405	373.242	922.300
MKAAI	(12.5,100]	2	2.023	10077.534	4980.421
MKAAI	(100,Inf]	2	1.012	5412.009	5349.341

crop_type	land_bin	hh	land	qty	yield
MONGI	(2.5,12.5]	2	1.669	1791.562	1073.222
MONGI	(12.5,100]	6	4.502	4665.525	1036.292
MONGI	(100,Inf]	6	9.662	12055.717	1247.761
MOUNGI	(12.5,100]	1	0.152	261.269	1721.627
MUNGI	(12.5,100]	1	1.214	223.945	184.460
MUNGI	(100,Inf]	2	0.809	1343.671	1660.140
MUSTARD	(100,Inf]	1	1.214	2239.452	1844.601
MUSTARD OIL	(100,Inf]	1	2.833	5225.388	1844.601
PARALI	(12.5,100]	1	0.304	298.594	983.787
PHOOL	(12.5,100]	1	0.202	559.863	2766.901
PUTSAN	(100,Inf]	1	0.101	1119.726	11067.603
RABI	(100,Inf]	1	0.101	7464.840	73784.020
RAI	(100,Inf]	1	0.405	933.105	2305.751
RAYA	(12.5,100]	3	3.845	4926.794	1281.512
RAZKA	(0,2.5]	1	0.051	2985.936	59027.216
Rice	(100,Inf]	1	1.619	3732.420	2305.751
RICE	(0,2.5]	3	0.860	2836.639	3298.580
RICE	(2.5,12.5]	19	9.308	31800.218	3416.521
RICE	(12.5,100]	136	124.390	473420.153	3805.923
RICE	(100,Inf]	88	101.526	340135.435	3350.243
SARSO	(12.5,100]	17	15.985	27769.205	1737.193
SARSO	(100,Inf]	22	18.211	26761.451	1469.532
SARSO/ CANOLA	(100,Inf]	1	1.518	22394.520	14756.804
SARSON	(12.5,100]	15	18.211	33106.565	1817.956
SARSON	(100,Inf]	17	16.390	29523.442	1801.332
STRAWBERRY	(0,2.5]	1	0.809	2239.452	2766.901
STRAWBERRY	(2.5,12.5]	1	0.405	821.132	2029.061
STRAWBERRY	(12.5,100]	1	0.405	933.105	2305.751
STRAWBERRY	(100,Inf]	4	2.833	10824.018	3820.958
SUGAR CANE	(12.5,100]	16	15.327	706845.700	46116.230
SUGAR CANE	(100,Inf]	16	43.504	3491940.179	80267.576
SUGARCANE	(0,2.5]	1	0.607	59718.720	98378.694
SUGARCANE	(2.5,12.5]	6	5.868	395636.520	67423.329
SUGARCANE	(12.5,100]	49	61.057	3596335.967	58901.288
SUGARCANE	(100,Inf]	24	35.865	1525813.296	42542.888
SUGARCANS	(100,Inf]	1	3.237	298593.600	92230.025
SURAJ MUKHI	(12.5,100]	2	5.666	10450.776	1844.601
TAMBACO	(100,Inf]	1	0.101	186.621	1844.601
TARBOZ	(12.5,100]	2	1.821	26126.940	14346.893
TEEL	(12.5,100]	4	2.226	783.808	352.151
TEEL	(100,Inf]	1	1.214	223.945	184.460
TIL	(12.5,100]	2	0.759	373.242	491.893
TIL	(100,Inf]	2	0.607	410.566	676.354
TILL	(2.5,12.5]	1	1.012	447.890	442.704
TILL	(12.5,100]	8	8.397	3695.096	440.037
TILL	(100,Inf]	4	2.175	2650.018	1218.294
WATER MILLON	(12.5,100]	1	0.202	1866.210	9223.003
Wheat	(0,2.5]	57	15.580	50686.264	3253.205
Wheat	(2.5,12.5]	280	185.801	598605.520	3221.748
Wheat	(12.5,100]	2450	3391.522	10105452.502	2979.622
Wheat	(100,Inf]	1619	3590.678	10769785.937	2999.374

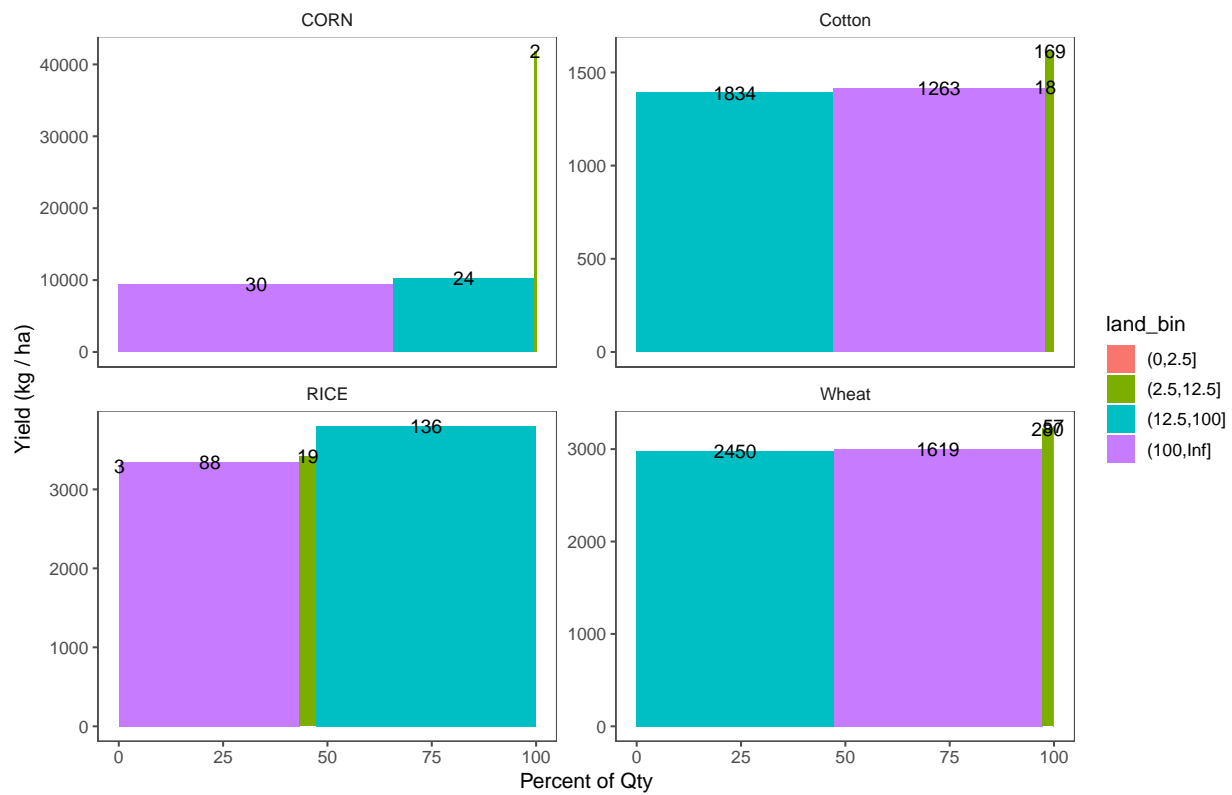
# Changes in Yield by Type of Farm 2019



Changes in Yield by Type of Farm  
2016



Changes in Yield by Type of Farm  
2019





Lets focus on 2019 and things that can tell us about where productivity differences come from.

Table 3:

	Dependent variable:			
	Wheat (1)	Cotton (2)	Rice (3)	Corn (4)
land_worked_acre	0.00003 (0.0003)	-0.0005 (0.0003)	0.001 (0.002)	-0.038 (0.152)
land_cultvd	-0.003*** (0.0004)	-0.001*** (0.0004)	-0.012* (0.007)	-0.319 (0.629)
fmly_wrkr_num	0.040*** (0.013)	0.017 (0.013)	-0.090 (0.090)	-5.335 (4.743)
hired_wrkr_num	0.011*** (0.002)	0.002 (0.002)	0.013 (0.011)	0.510 (0.567)
seed_acreB	-0.002 (0.002)	0.021*** (0.005)	-0.006 (0.013)	
seed_acreC	-0.004** (0.002)	-0.002 (0.005)	0.003 (0.005)	-0.905 (0.607)
kg_fert_acrea	0.001 (0.001)	0.003*** (0.001)	-0.007* (0.004)	-0.336 (0.252)
kg_fert_acreb	-0.0003 (0.0005)	0.003*** (0.0004)	-0.004 (0.002)	-0.026 (0.147)
kg_fert_acrec	0.0002 (0.001)	0.001 (0.001)	0.007* (0.004)	-0.066 (0.323)
rel_area_tractor	0.015 (0.085)	0.061 (0.058)	-0.033 (2.836)	3.651 (56.167)
rel_area_landlevel	-0.075* (0.045)	-0.345*** (0.049)	0.257 (0.272)	-20.285 (15.864)
rel_area_harvester	0.408** (0.159)	0.401 (0.255)	0.392 (0.259)	-27.479 (40.090)
D_orgnc_mnreNo	0.026 (0.038)	0.088** (0.042)	-0.477** (0.235)	-10.045 (15.933)
D_micro_ntrntsNo	-0.185** (0.076)	-0.047 (0.072)	-0.242 (0.258)	2.009 (15.810)
irr_methdFurrow	0.224 (0.229)	0.244*** (0.044)	-0.441 (0.661)	-3.332 (16.959)
irr_methdBed and furrow	0.201 (0.126)	0.290*** (0.062)	-0.067 (0.652)	-32.629 (20.798)
irr_methdOther (Specify)	-1.784 (1.128)			
soil_qualModerate	0.215*** (0.055)	0.238*** (0.064)	0.404 (0.504)	4.393 (18.840)
soil_qualLoam	0.238*** (0.068)	0.255*** (0.078)	0.360 (0.567)	-4.767 (22.261)
soil_qualClay loam	0.224*** (0.067)	0.354*** (0.077)	0.686 (0.534)	30.524 (23.237)
soil_qualClay	0.430*** (0.065)	0.457*** (0.074)	0.875 (0.539)	16.386 (21.347)
soil_qualOther (Specify)	0.123 (0.172)	0.292 (0.194)	-0.876 (1.000)	
land_fert_typeVery poor	-0.216 (0.217)	-0.233 (0.233)	3.543 (2.252)	
land_fert_typePoor	-0.218 (0.171)	-0.342* (0.192)	-0.175 (1.453)	
land_fert_typeModerate	0.106 (0.153)	-0.168 (0.166)	-0.314 (1.292)	
land_fert_typeVery Fertile	0.232 (0.165)	-0.083 (0.177)	-0.360 (1.338)	6.342 (41.626)
soil_fert_rank	0.029* (0.016)	0.059*** (0.017)	0.102 (0.095)	1.886 (5.089)
land_steep_typeSlight slope	0.005 (0.061)	0.042 (0.068)	0.347 (0.413)	-26.744 (19.390)
land_steep_typeModerate slop	-0.225** (0.089)	-0.115 (0.092)	0.001 (0.816)	-32.414 (44.585)
land_steep_typeSteep Slope	0.204 (0.191)	0.050 (0.233)	-0.195 (1.464)	-15.039 (32.339)
access_canal_waterNo	0.172*** (0.041)	0.434*** (0.047)	0.301 (0.307)	30.338* (15.385)
access_tubewellDo not own a tubewell but have access to tubewell water	-0.136*** (0.039)	0.088** (0.044)	-0.027 (0.226)	9.507 (13.830)
access_tubewellNeither own nor have access to a tubewell water	-0.143 (0.105)	0.092 (0.107)	-0.796 (0.662)	
land_suffer_waterlogNo	-0.012 (0.062)	0.180** (0.075)	-0.101 (0.287)	-22.537 (46.710)
land_suffer_salinityNo	0.194*** (0.060)	0.101 (0.072)	-0.433 (0.298)	21.929 (45.494)
land_suffer_erosionMild Erosion	0.041 (0.045)	0.136*** (0.049)	0.406 (0.317)	-11.385 (19.131)
land_suffer_erosionSevere Erosion	-0.023 (0.114)	-0.098 (0.156)	-0.600 (0.710)	13.813 (43.043)
D_more_fert_qtyNo	0.114*** (0.039)	0.148*** (0.043)	-0.076 (0.220)	-5.148 (12.644)
soil_cmprd_othersSame	-0.223*** (0.064)	-0.272*** (0.069)	0.332 (0.373)	-8.877 (40.770)
soil_cmprd_othersWorse	-0.492*** (0.099)	-0.386*** (0.113)	0.199 (0.670)	-2.464 (45.252)
Constant	3.520*** (0.278)	0.778*** (0.245)	5.193 (3.326)	74.217 (90.205)
Observations	4,314	3,150	227	49
R <sup>2</sup>	0.080	0.174	0.231	0.734
Adjusted R <sup>2</sup>	0.072	0.164	0.071	0.088
Residual Std. Error	1.125 (df = 4273)	1.041 (df = 3110)	1.413 (df = 187)	27.664 (df = 14)

Note:

\*p<0.1; \*\*p<0.05; \*\*\*p<0.01