

Lhj {k.k dfrk eaeDdk cphbz ; a-kadk e/; Hkkjr dh dkyh enk ea ryukRed v/; ; u

I h ih I kor*1] ds ih fl g1] vkj- , I - fl g1] ct yky ydkfj; k1] vuqkx i Vy1] vft rk xrk1] vftkthr [Mrdj1 , oaeukt dckj1

Hkk—vuqi -&clbæh; —f'k vftk; kfi=ch I kFku] uchckx] c]fl ; k jkM Hkky&462 038] e/; insk] Hkkjra

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I kjkã

bl v/; ; u eaeDdk dh mi t] Åtkzvks ykxr ij uk&fvy lykã/I zt] & buDykbMM lyv/ lykã/j , oaczM cM 'ki j&de&lykã/j dscHkko dh ryuk i kjãfjd I hM&de&QfVykbtj fMy dsl kfk vkbã h, vkj&daeh; —f'k vftk; kfi=ch I kFku] Hkky ky ds vuq ddku QkeZ ea dh x; hA eDdk dh I d] fdLe DMRH-1301 dks 2019 ds [kjhQ I ht u ea buDykbMM lyv/ lykã/j vks czM cM 'ki j&de&lykã/j I si mZeayh x; h xgn/HD-1544½ dh QI y ds MBy 1/8 q/ha½ ds I kfk cks k x; kA bl I sigys dEckbu gkoLVj }kjk xgn dh dVkbz dh xbz vks bl ds MBy JMj dk mi ; ks dj ds Nks/sfd; sx; A buDykbMM lyv/ lykã/j] czM cM 'ki j&de&lykã/j vks I hM&de&QfVykbtj fMy dh okLrfod {ks= {kerk vks {ks= n{krk Øe'k%0.31,0.32 vks 0.39 gDVs j@?k/k vks 51.67, 58.18 vks 76.46% çkr gq A Lhj {k.k —f'k eae buDykbMM lyv/ lykã/j }kjk eDdk dk mri knu 5.57 t/ha] czM cM 'ki j&de&lykã/j }kjk 5-58 t/ha , oal hM&de&QfVykbtj fMy }kjk 4-90 t/ha çkr gq rFk QI y vo'kks mri knu buDykbMM lyv/ lykã/j }kjk 8-23 t/ha] czM cM 'ki j&de&lykã/j }kjk 9-27 t/ha , oal hM&de&QfVykbtj fMy }kjk 6.06 t/ha] çkr gq A xgn ds QI y vo'kks çdku dsfy, JMj dh Åtkz [ki r 399.31 MJ/ha FkA I cl svf/kdre Åtkz dh [ki r i kjãfjd I hM&de&QfVykbtj fMy 1/4 966.15 MJ/ha) dh Fk D; kãd bl ea tehu r]kj djus dsfy, jks/koVj , oadYVhoVj nkska dks, d&, d ckj pyk; k x; k Fk] bl dscn Åtkz dh [ki r Øe'k% buDykbMM lyv/ lykã/j (468.77 MJ/ha) vks czM cM 'ki j&de&lykã/j (792.39 MJ/ha) ea FkA buDykbMM lyv/ lykã/j vks czM cM 'ki j&de&lykã/j ea i kjãfjd I hM&de&QfVykbtj fMy dh ryuk ea Øe'k%319% vks 148% Åtkz dh cpr çkflr gqA buDykbMM lyv/ lykã/j (664 Rs/ha) vks czM cM 'ki j&de&lykã/j 1/652 Rs/ha) ds mi ; ks I st rkbz , oai kjãfjd I hM&de&QfVykbtj fMy (2017 Rs/ha) dh ryuk eaeDdk cphbz ea 67% ykxr cphbz x; hA

'Kn dck h%uk&fvy lykã/j] I j {k.k —f'k] eDdk&xgn QI y ç.kkyh] Åtkz foKku] ykxrA

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Comparative Evaluation of Maize Planters in Conservation Agriculture under Black Cotton Soil of Central India

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ABSTRACT

The present study was conducted at ICAR-Central Institute of Agricultural Engineering, Bhopal research farm to study the effect of no-till planters such as inclined plate planter and broad bed shaper-cum-planter on yield, energetics and economics of maize crop production and compared with conventional practices of maize sowing using seed-cum-fertilizer drill. The maize hybrid variety of DMRH-1303 was sown in kharif season of 2019 using inclined plate planter and broad bed shaper-cum-planter under wheat residue load 8 t/ha (HI-1544). The wheat was harvested by combine harvester and its residue was chaffed using shredder. The actual field capacity and field

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1Hkk—vuqi -&clbæh; —f'k vftk; kfi=ch I kFku] Hkky ky&462 038] e/; insk]

2Hkk—vuqi -& Hkkjrh; enk foKku I kFku] Hkky ky&462 038] e/; insk]

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efficiency of inclined plate planter, broad bed shaper-cum-planter and seed-cum-fertilizer drill were observed as 0.31, 0.32 and 0.39 ha/h and 51.67, 58.18 and 76.47%, respectively. The energy consumption for shredding of wheat straw was 399.31 MJ/ha. The energy consumption was maximum in case of sowing with convention seed drill (1965.30 MJ/ha) including single pass of each cultivator and rotavator, which was followed by broad bed shaper-cum-planter under permanent bed condition (792.39 MJ/ha) and inclined plate planter under permanent bed condition (468.77 MJ/ha). The broad bed shaper-cum-planter and inclined plate planter saved energy consumption by 59.7% and 76.14%, respectively as compared to conventional seed-cum-fertilizer drill. The use of inclined plate planter (Rs. 652/ha) or broad bed former-cum-planter (Rs. 664/ha) could save 67% in cost of operation compared to tillage followed by seed-cum-fertilizer drill (Rs. 2017/ ha).

Key words: No-till planter, Conservation agriculture, Maize-wheat cropping system, Energetics, Cost economics.

çLrkouk

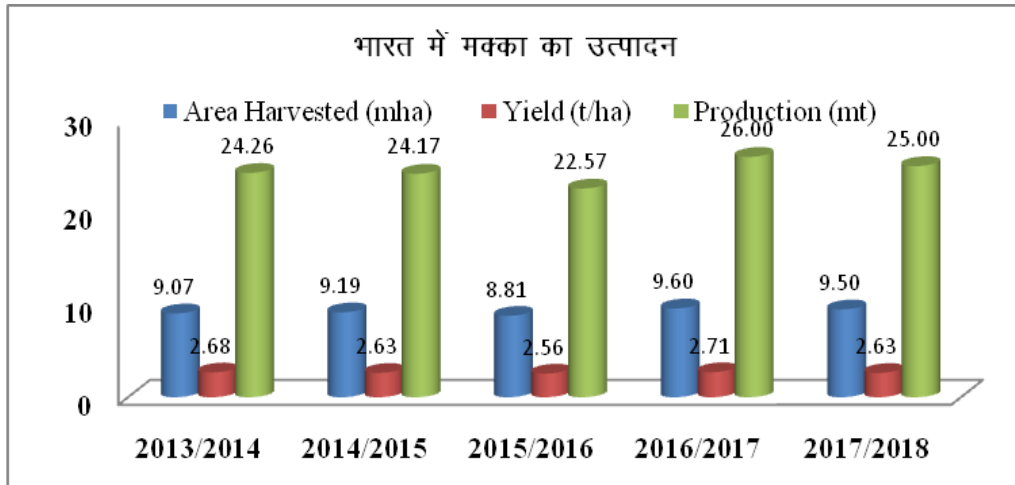
eDdk (Zea mays) fo' o dh , d çed'k [kk | klu Ql y gA Hkkjr eaeDdk dk mi ; kx [kk | klu Ql ykaea /kku , oaxgudscn rhl jsLFkku ij fd; k tkrk gA nsk ea eDdk dk mi ; kx [kk | klu , oapkjsdsfy, fd; k tkrk gA oS seDdk dh Ql y /kku;] pkjk , oavkSj kfxd n'V l sHk egRoikZgA ; g eç; : i l s [kjhQ dh Ql y gA yxHkx 85% eDdk dh Ql y [kjhQ eayh tkrh gS , oa 15% Ql y jch eayh tkrh gA eDdk dksvukt dh jkuh dgk tkrk gS; kAd eDdk dk gj Hkx mi ; kxh gkrk gA eDdk ds gjsHkpsdksvxk eaHku dj [kk; k tkrk gA gjsM. By dks i 'kpkjk ea mi ; kx fd; k tkrk gS rFkk bl dk vkukt cgmi ; kxh gA or'eku ea bl dk mi ; kx ekuo vkgkj ds vykok d'p'dv vkgkj] i 'kqvkgkj] LVkpZ 'kjk vksj cht ds : i eafd; k tk jgk gA xjhckad Hkstu eDdk vc vi us i kS'Vd xqkka ds dkj .k vehjkads [kkusdest dh 'kku c<kus yxk gA vc eDdk dksduç i , i dkuç LohV d, uç cch d, uç vkfn vudka : i ea igpu fey pph gA fo' o ds vud nskks ea eDdk dh [krh çp'yr gS ftuea {k=Qy , oa mRi knu dsfgl kc l sl a ç jk'V^a vesj dk] phu vksj çkthy dk fo' o ea Oe'k%çFke] f}rh; , oar'h; LFkku gA fi Nys dN o'kk'aeDdk mRi knu ds {k= eaHkkjr usu; sdhfr'eku LFkfi r fd; sgSft l l so'kz2017&18 eaeDdk dk mRi knu 250-00 yk[k Vu dsmPp Lrj ij i gpp x; k gS, oamRi kndrk 2630 fd-xk@gS ds Lrj ij gA o'kz2015&16 ds v'kdMka dsfgl kc l snsk eaeDdk mRi knu 160-53 yk[k Vu [kjhQ vksj 65-15 yk[k Vu jch ekS e dh Ql y dk jgk ft l l s dny eDdk mRi knu dh 225-67 yk[k Vu v⁹ r mi t ntZ dh xbl (fp= f-)A

eDdk , d i kS'Vd vkgkj gS rFkk i Uka ea fyi Vs jgusdsdkj .k dhVuk'kd j l k; ukadsçHkko l syxHkx eçj gkrk gA bl ea QkLQkjl çpç ek=k eamiyç/k gkrk gA

eDdk ds nkus ea 7&14% çkS/hu] 69&75% dkckçkbM/S] 4&7% ol k] 0 8&2-5% ØM Qkbcj] 0-7&1-3% jk[k rFkk 1&3% 'kDdj ik; k tkrk gS(Cortez and Wild-Altamirano, 1972; Panzeri, 2011)A ikpu ds-f'V l sHk ; g , d vPNk vkgkj gA bl sdPpk ; k i dk dj [kk; k tk l drk gA bl l s vud çdkj ds 0; at u cuk, tkrS gA tS sHkçt; k] y i ç gyok] vkgkj] dSMh] eççk] cQhç tS BR; kfnA nsk ea yxHkx gj txg eDdk dh çp'kbl ikjç fj d ; æ k l s dh tkrh gS ft l dsfy, [kr dh t'p'kbl t#jh gkrh gA ikjEi fj d ; æ k s dh n{krk , oa {kerk dk Qh de gkrh gS vfi rqbuds mi ; kx ea Å tkZ dh vf/kd [kir gkrh gA bl fy, eDdk dh çp'kbl vksj mRi knu dsfy, vk/kfud ; æ , oardfudh tS sl çf{kr [krh dk mi ; kx djuk pkfg, A u; scp'kbl ; æ tS sbu DykbM lys/ lykç/j] thjksfv y lykç/j] çM çM lykç/j] l; eS'Vd lykç/j vkfn dsek/; e l seDdk dh mRi knu ykx eadeh dh tk l drh gS vksj bu ; æ k s dh n{krk vksj {kerk vf/kd gkrh gA vr%bl vuq' dku yçk eal çf{kr [krh ea eDdk dh çp'kbl ds vk/kfud ; æ ka dh rgyuk ikjç fj d ; æ l sfoLrç : i eaçLrç dh gA

l kexh , oa i jh{k.k fof/k

l ç {k.k [krh ds v'lrçZ] eDdk ds Ql y ij v/ ; ; u tçykbZ 2018 l s vkbZ h, vkgj & dæh; -f'k v'fkk; kfi=dh l Hkku] Hkksi ky eafd; k tk jgk gA çM ij e'khuks }kjk eDdk dh çp'kbl dsfy, rhu e'khu dk ç; kx fd; k x; k rFkk çp'kbl ds l kFk l kFk moç d ds vkonu dk i jh{k.k] çn'kZu , oa eV; kAdu fd; k x; kA bl sç; kx'kkyk vksj {k= dh lLFkr ds rgr e'khu ds çn'kZu eV; kAdu l sl çç/kr fofHku eki nMka ds fjd, MZdj us dsfy, mi ; çj eki rdudh Hk 'kkfey gA cht , oamoç d ds fofHku njkavksj fHkurk ds xqkka ds fu/kkZ .k dsfy, ç; kx'kkyk ea e'khuks dk



fp= 1% Hkkjr eadDk dk {ks-} mi t , oamRiknu (NCML, 2017)

x.kuk fd; k x; k FkA eDdk dh Ql y ij e'khu ds {ks-} ij h{k.k fd, x, vj\$ bl ds n'ku eki nMka dks n tZfd; k x; kA e'khu }jkk cht dh dqky i ekb'k ds fy, Hkksrd xqkka t\$ s vdkj] yEckbz rFkk cht , oamo]d dk otu c; kx'kkyk eafu/kkZjr fd; k x; kA

eDdk dscht ds vuq kj e'khu dh VkbZu l s vkbZu vj\$ cht l scht dh njih dk fu/kkZ .k fd; k x; kA Vkbv vj\$ Qjks vki uj dh l jpuK ds fy, feeh ds cdkj] feeh ds cfrjksku] feeh dh ueh vj\$ dkyh feeh ds ?kuRo dks e[; dkjd ekuk x; k FkA eDdk Ql y eac; kx'kksokys fuEu e'khuks dk foj.k [kkn , oacht x.kuk] ueh dh ek=k feVvh dk ?kuRo] 'kadq] pdkad] e'khu dh xfr] 'kfa dh vko'; drk] i fg; k dk fQl yu] {ks-} {kerk] {ks-} n{krk , oabZku dh [kir dk folRr v/; ; u fd; k x; k gA

eDdk cPkbZ ds fy, mUur ; a-

V\$Vj pkyr ikjafjd l HM&de&QfVykbtj fMy%
 ikjafjd l HM&de&QfVykbtj fMy l s cPkbZ ds igys [kr dh , Ek-ch- lykA] jks/koVj , oadYVhoVj l s tPkbZ dh tkrh gA bl ; a- eacht , oamo]d dh mfpr ek=k dks [kr eack s ds fy, vj\$ fMyM jksj Vkbi ehVfjx ; fuV gkrk gA bl ; a- ds mi ; kx l seDdk , d drkj c\$ k tkrk gS , oabl eadrkj l s drkj njih cukbZj [kh tkrh gS ij i k\$ l s i k\$ njih ugha cukbZ tk l drhA

thjksfVy fMy% fi Nyh Ql y dh dVkbZ ds mi jkr fcuk tPkbZ fd; sgq [kr eae'khu }jkk eDdk dh cPkbZ djus dh c.kkyh dks thjksfVy fMy dgrs gA bl fof/k l s cPkbZ djus ij [kr dh tPkbZ djus dh vko'; drk ugha i MfH gS rFkk [kkn , oacht dh , d l kFk cPkbZ dh tk l drh gA bl rduhd l s fpuh feeh ds vykok vl; l Hkh cdkj dh enkvkae eDdk dh [krh dh tk l drh gA thjksfVy fMy

e'khu l k/kk .k fMy dh rjg gh g\$ ijUrqb l ea b loVM Vh&Vki dh Vkbv gkrh gA ; g Vkbv feeh ea iryh l h ykbu cukh g\$ ft l ea [kkn , oacht mfpr ek=k ea l gh xgjkBz ij i gpp tkrk gA thjksfVyst ea'kkfey cPkbZ; a-ka dk foj.k fuEu cdkj gA

V\$Vj pkyr buDykbM lyV lykVj% eDdk dh ykbu l sykbu vj\$ i k\$ l s i k\$ dh njih cukdj cPkbZ djus ds fy, buDykbM lyV lykVj dk mi ; kx vf/kd fd; k tkrk gA V\$Vj pkyr est lykVj l sjch es 2-0&3-0 cm rFkk tk; n o [kjhQ ea 3-5&5-0 cm dh xgjkBz ij cht c\$ k tkrk gA bl e'khu }jkk cPkbZ djus l s [kkn vj\$ cht dks , d l kFk Mkyk tkrk gA fd l kuks }jkk eDdk dh cPkbZ gsrqbl e'khu dk c; kx vf/kd fd; k tk jgk gA

V\$Vj pkyr cM cM 'kij&de&lykVj% eDdk dh cPkbZ l kekl; r% drkjs ea dh tkrh gA bl rduhd ea eDdk dks eMka ij , d i fa eack k tkrk gA fi Nys dN o'kkae; g ik; k x; k gfd bl rduhd l s [kkn , oai kuh dh dkQh cpr gkrh gsvj\$ mRiknu Hkh cHkfor ugh gkrk gA eDdk cPkbZ; a-ka dk folRr foj.k rkfydk% eafd; k x; k gA

[kkn , oacht x.kuk% l dj eDdk (DMRH-1301) dh cPkbZ gsrq cfr gDVs j 23 kg cht , oad y Mst ea 75 kg ukbVst u] 60 kg QkLQkj l , o 60 kg i k\$ /k'k dh x.kuk dh x; hA [kkn , oacht x.kuk vko'; drk ds vuq kj dh ft l l s [kkn , oacht dk uq l ku uk g l ds , oag ml ek=k ds vuq kj mo]d , oacht dks Mkyk tk l dA e'khu ds i fg; s dks vk/kk ds l kFk mBkdj j [kk vj\$ ml ds ckgj h l rg ij fu'kku cukdj ml ds , a pDdj yxk , x, A e'khu i fg; sdh , a i f f/k eaftruk {ks-} uki rh gS ml ds vk/kk ij , d gDVs j ea 23 kg cht , oa 180

Hkkjrh; d'f'k vuq dku if=dk



fp= 1%ikjäfjd I hM&de&QfVlykbtj fM'y] buDykbDM lyV lyk&j , oaczM cM lyk&j e'khu }kjk eDdk dh c&pkbA

rkfydk1%eDdk c&pkbZ ; a=ka dk foLrr foj .ka

Ø-l a e'khu ds Hkkx	buDykbDM lyV lyk&j	cM dM 'kij&de&lyk&j	I hM&de&QfVlykbtj fM'y
1 i koj 'kfä U; wg,yM&3630	VØVj pkfyr	VØVj pkfyr	VØVj pkfyr
2 'kfä dh vko'; drk ¼ Pk-lk-½	55	55	55
3 QjksVkbi	buoVM Vh Vkbi	' 'kwVkbi	' 'kkoy Vkbi
4 Qjksvki uj I d; k	02	02	02
5 dk; Zdjusdh pkMkb] mm	1500	1500	1500
6 Vkbu I sVku dh njh] mm	750	750	750
7 i k&k I s i k&k dh njh] cm	20	20	--
8 e'khu i jkehVj			
yEckb] mm	1380	1360	2150
pkMkb] mm	2500	2100	1320
Äpkb] mm	1070	1000	1250
9 cht i k&k'k mi dj .k	buDykbDM lyV	buDykbDM lyV	¶lywM jkyj

kg [kkn ¼75 kg ukbM/stu] 60 kg QkLQjI , oa 60 kg i k&k'k½ nj fuf'pr fd; k x; kA eDdk ea150 I s180 kg ukbM/stu] 60&70 kg QkLQkj I] 60&70 kg i k&k'k rFkk 25 kg ftad I YQV çfr gDVsj nuk mi; ä ik; k x; k (Mohamadi NK, 2017)A rhuks; a=ks I s, d gDVsj [kr ea eDdk c&pkbZ dh x; hA c&pkbZ ds I e; ; a=ka ds fofHku çn'kzu eki nM/ka dh x.kuk dh x; h tS s; a=ka dh dk; Z{kerk] dk; Zn{krk] b&ku [ki r] fLyi vkfnA bl h ds I kFk feeh ds fofHku eki nM/ka dh x.kuk dh x; h ft I eseeh eaueh dh ek=k] dny ?kuRo] 'kadqI pdkad vkfn 'krfey gA

i fj .ke , oa foopuk

I j{k.k —f'k ea eDdk dh c&pkbZgrqrhu ; a=ks dk ç; ks fd; k x; k gSft I dk foLrr foj .k rkfydk%2 ea fn; k x; k gA c&pkbZdjrs I e; feeh eaueh dh ek=k 15%

Fkh] feeh dk dny ?kuRo 1.6 g/cm³ Fkk , oafeeh dk 'kadq I pdkad 1.8 MPa FkkA

eDdk c&pkbZ ; a=ks ds fofHku çn'kzu eki nM%eDdk c&pkbZ ds fy, drkj I s drkj , oacht I s cht dk varj Øe'k%75 cm v& 20 cm j [kk x; k FkkA buDykbDM lyV lyk&j v& cM cM 'kij&de& lyk&j dks 2.5 km/h rFkk I hM&de&QfVlykbtj fM'y dks 3.0 km/h dh xfr I spyk; k FkkA cht dh xgjkbZ 4-5 cm , oa, d t xg ij e'khu 1-2 cht gh fxjk i k, , d se'khu dks I ek; kf-tr fd; k FkkA eDdk c&pkbZ ea buDykbDM lyV lyk&j] cM cM lyk&j , oa I hM&de&QfVlykbtj fM'y dh {ks= {kerk , oa {ks= n{krk Øe'k% 0.31, 0.32 v& 0.39 ha/h , oa 51.67, 58.18 v& 76.46% ik; h x; hA I hM&de&QfVlykbtj fM'y vPNs I s t qrs gq [kr ea FkkMk T; knk rsth I s pyk; k

rkydk 2%cpkbz; a=ks dsfofklku çn' kzu eki nmlka dk foLr'r fooj.k

Ø-l a	e'khu ds Hkkx	buDykbDM ly/ lyk/j	czM cM 'kij&de&lyk/j	I hM&de&QfVykbtj fMy
1	cht nj] kg/ha	23	23	23
2	e'khu dh xfr, km/h	3-0	3-0	2-5
3	cht dh xgjkbl] mm	40&50	40&50	40&50
4	cht dh l [; k@fgy	01&02	01&02	--
5	{k= {kerk] ha/h	0-31	0-32	0-39
6	{k= n{krk] %	51-67	58-18	76-46
7	i fg; k dk fQl yu] %	5-30	3-63	6-0
8	bzku dh [ki r] l/h	4-5	5-0	4-5
9	e'khu dh yxHkx dher] Rs.	60]000	80]000	60]000
10	e'khu dh ykxr] Rs/ha	652-02	664-92	2017]k/koVj , oadYVhoVj½

rkydk 3%eDdk Ql y dh eki , oamRi knuA

eki nml	buDykbDM ly/ lyk/j	czM cM 'kij&de&lyk/j	I hM&de&QfVykbtj fMy
i ksk dh l [; k@eh ²	9	13	11
i ksk dh Åpkbl] mm	51	56	58
vukt mRi knu (t/ha)	5-57	5-58	4-90
Ql y vo' ksk mRi knu ¼t/ha½	8-23	9-27	6-06
Å tkZeW; kdu ¼MJ/ha½	468-77	792-39	1966-15]k/koVj , oadYVhoVj½

x; k Fkk vj] ml esxgWdsvo' ksk de Ql sFksbl dsdkj.k ml dh {k= {kerk , oa{k= n{krk ckdh thjksfVyst e' khuka l scgrj i k; h x; hA ml h çdkj I hM&de&QfVykbtj fMy eabuDykbDM ly/ lyk/j vj] czM cM 'kij&de&lyk/j dh ryuk ea i fg; k dk fQl yu T; knk i k; k x; kA ftl sde djusdsfy, ml dh xfr de j [kh x; h] D; kfd xfr ds l kFk i fg; k dk fQl yu de ; k T; knk gkrk gS(Mamkagh, 2019)A rhukscpkbze' khuka eabzku dh [ki r yxHkx 4.5 l s 5.0 l /h FkA

e'khu dh ykxr dk vuëku% xgW dh dVkbz ds ckn Ql y vo' ksk ççaku , oa eDdk dh cpkbz grq mi ; kx fd; s x; VDVj pkfyr e'khu dh ykxr dh x.kuk dh x; hA VDVj pkfyr LV^a eYpj dh ykxr : 726-96/ha] , oa eDdk dh cpkbz ea ç; kx dh xbz e' khuka dh ykxr ftl eabuDykbDM ly/ lyk/j dh ykxr : - 664-92/ha , oaczM cM 'kij&de&lyk/j dh ykxr 652-02 Rs/ha , oal hM&de&QfVykbtj fMy dh ykxr 2017 Rs/ha gS D; kfd bl es jk/koVj rFkk dYVhoVj dh ykxk Hkh tkMh xbz gA buDykbDM ly/ lyk/j vj] czM cM 'kij&de&lyk/j ds mi ; kx l s i k j ä f j d I hM&de &QfVykbtj fMy dh ryuk ea eDdk cpkbz ea 67% ykxr cpkbz x; hA

eDdk mRi knu%l jf{kr —f'k ea buDykbDM ly/ lyk/j }kjk eDdk dk mRi knu 5-57 t/ha] czM cM lyk/j }kjk 5-58 t/ha , oal hM&de&QfVykbtj fMy }kjk 4-90 t/ha çklr gWk rFkk Ql y vo' ksk mRi knu buDykbDM ly/ lyk/j }kjk 8-23 t/ha] czM cM 'kij&de&lyk/j }kjk 9-27 t/ha , oal hM&de&QfVykbtj fMy }kjk 6-06 t/ha] çklr gWk ¼rkydk%3¼A bl çdkj eDdk vukt , oa Ql y vo' ksk dk mRi knu buDykbDM ly/ lyk/j , oa czM cM 'kij&de&lyk/j }kjk I hM&de&QfVykbtj fMy dh ryuk ea Øe'k%11-85] 15-15] 12-03 vj] 11.22% vf/kd çklr gWkA

e'khu dh Å tkZ dk eW; kdu% eDdk dh cpkbz l si wZ xgW dsvo' ksk ççaku djusdsfy, LV^a eYpj dk ç; kx fd; k x; kA eYpj ds mi ; kx l s xgWdsvo' ksk dk ççaku djus grW 399.31 MJ/ha Å tkZ dh [ki r gksh gS, oal k j ä f j d fof/k l scpkbz dsfy, QhYM dh rS kjh grq dYVhoVj \$ jk/koVj \$ I hM&de&QfVykbtj fMy dh mtZ dh [ki r 1966.15 MJ/ha ds vf/kdre gS ftl ds ckn Å tkZ dh [ki r ea buDykbDM ly/ lyk/j ¼468-77 MJ/ha½ vj] czM cM 'kij&de&lyk/j ¼792-39 MJ/ha½ }kjk jgh ¼rkydk%3¼A i k j ä f j d I hM&de&QfVykbtj fMy dh ryuk eabuDykbDM ly/ lyk/j vj] czM cM 'kij&de&lyk/j }kjk Øe'k%319 vj] 148% Å tkZ dh [ki r cphA

fu"d"l'z

mijka v/; ; u l s ; g i k ; k x ; k dh ikja fjd
 [krh ea cphbz l sigys [kr dh t'rbz vko'; d gkrh gS
 ft l l sdh ikja fjd [krh ea Atkzdh [ki r , oamRiknu dh
 ykxr l j {k.k [krh dh rgyuk ea vf/kd gks tkrh gA
 l hM&de&QfVlykbtj fMy }kjk eDdk dh cphbz djust s
 buDykbMM lyv lykaj , oaczM cM 'kij&de&lykaj dh
 rgyuk ea eDdk dk mRiknu de gkrk gS Atkzdh [ki r
 vf/kd gkrh gS, oa ykxr Hkh T; knk vkrh gA buDykbMM
 lyv lykaj vksj czM cM 'kij&de&lykaj ikja fjd
 l hM&de&QfVlykbtj fMy dh rgyuk ea Øe'k%319 vksj
 148% Atkzdh cpr djrs gA buDykbMM lyv lykaj
 vksj czM cM 'kij&de&lykaj t'rbz , oa ikja fjd
 l hM&de&QfVlykbtj fMy dh rgyuk ea eDdk cphbz ea
 67% ykxr dh cpr gkrh gA vr% buds mi ; kx dks
 c<kok ndj eDdk dh Ql y l s vf/kd mRiknu o ykHk
 fy; k tk l drk gA

l nHkz

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