RESEARCH ARTICLE Bhartiya Krishi Anusandhan Patrika, Volume Issue : ()

VDVj lpkfyr xUuk iÙkh fLVij dk fMtkbu vkj fodkl

vujkx iVy] “khu Dykbu ekl l] ç”kkr ,e- fMl tk] jk.kk ,u- vkye

lkjk”k

i‘BHkfe% Hkkjr nfu;k e xUu dk nljk lcl cMk mRiknd gA Hkkjrh; jkT;k e xUu dk vf/kdre mRiknu] mÙkj çn”k] egkjk”V] itkc vkj fcgkj e g¨rk gA 2019 d n©jku] Hkkjr e yxHkx 307 yk[k Vu xUu dk mRiknu fd;k x;k Fkk] tk of”od xUuk mRiknu dk yxHkx 11-8 çfr”kr gA xUu dh Qly e cgr ych ifÙk;k gkrh gA xUu dh ifÙk;k dk Nhyuk ,d cMh leL;k g] tkfd dkQh Je ;ä dk; gA bl leL;k dk gy dju d fy,] ,d VDVj pfyr xUuk fLVij e”khu dk dl;Vj ,MM fMtkbu ¼CAD½ l¶Vo;j dk mi;kx djd fMtkbu fd;k x;k gA

fof/k;% e”khu d e[; Hkkx] Ýe] i,oj Vklfe”ku fllVe] Vkl ikV”ku fllVe] QhM g,ij duo;j] xUuk Mh&V,ij vkj ,d fLVij fllVe gA e”khu l xUu dh fNykb dju l ekuo dk gku okyh n?kVuk de gk tk,xA bl xUuk fLVij e”khu dk jk”V;kih cgr vPNh Loh—fr fey jgÊ gA fLVij e”khu dk —f”k vfHk;kf=dh lHkkx] le fgfxuc,Ve ;fuoflVh v,Q ,xhdYpj VDuky,th ,M lkbl t] ç;kxjkt] mÙkj çn”k] Hkkjr e “kk/k dk; fd;k tk jgk gA

ifj.kke% bl e”khu d mi;kx l dk;okgh dh ykxr vkj le; dk de dju e Hkh enn feyxhA Hkfo’; e] ;g e”khu fLVfix dh x.koÙkk e l/kkj dju d lkFk&lkFk llk/kuk d çHkkoh mi;kx dk lfuf”pr dju e enn djxhA xUuk iÙkh fLVij dk fMtkbu vkj fodkl ,d egRoi.k Hkfedk fuHkk,xkA

“kCndth% iÙkh fLVij] ekuo n?kVuk dk de djuk] xUuk] VDVjA

Design and Development of Sugarcane Leaf Stripper

Anurag Patel, Sheen Cline Moses, Prashant M. D’souza, Rana N. Aalam **10.18805/BKAP463**

ABSTRACT

Background: India is the second largest producer of sugarcane in the world. Uttar Pradesh, Maharashtra, Punjab and Bihar are Indian states have maximum production of sugarcane. During 2019, approximately 307 lakh tonnes of sugarcane was produced in India, which is nearly 11.8 per cent of the global sugarcane production. Sugarcane crop has very long leaves. Stripping of sugarcane leaves is a major problem, which requires labor-intensive effort. Therefore, to resolve this problem, a tractor operated sugarcane stripper machine was designed using the computer aided design (CAD) software.

Methods: In main frame of CAD design, a power transmission system, transportation system, feed hopper conveyer, sugarcane de-topper and a stripper system were designed. This machine will reduce human drudgery. Currently, this sugarcane stripper machine is getting very good acceptance nationwide. Further research has been undertaken at Department of Farm Machinery and Power Engineering, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj, Uttar Pradesh, India. This machine was designed.

Result: Use of this machine will also help in reducing the cost and time of operation. In future, this machine will help in improving quality of stripping as well as ensuring effective utilization of the resources. The Design and development of sugarcane leaf stripper machine will play a significant role.

Key words: Leaf stripper, Reduce human drudgery, Sugarcane, Tractor.

çLrkouk

Hkkjr dh yxHkx nk frgkb tul[;k d fy, —f’k gh ,d ek= lk/ku gA Hkkjrh; —f’k Hkkxkfyd {k= dk yxHkx 43 çfr”kr vkj thMhih e yxHkx 16 çfr”kr ;kxnku nRkh gA fdlkuk }kjk mxkbZ tku okyh Qlyk dh l[;k ,o bue vyx&vyx Ø,i “kkfey gA xUuk] Hkkjr e mxkbZ tku okyh egRoi.k 0;kolkf;d Qlyk e l ,d g tkfd jk’Vª; vFk0;oLFkk e ,d fu.kk;d Hkfedk fuHkkrh gA —f’k dk;k e Jfedk dh deh d dkj.k xHkhj pukfr;k dk lkeuk djuk iM jgk g] u doy ihd lhtu e] cfYd

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vlkekU; le; e Hkh gA Hkkjr e yxHkx 22 fefy;u gDV;j e xUu dh [krh dh tkrh g] rFkk mRiknu yxHkx 70 Vu@gDV;j vkj mRikndrk 300 yk[k Vu gA gkykfd] db dkjdk d dkj.k fiNy dN o'kk e xUu d {k= e mrkj&p<ko n[kk x;k gA mit Lrj e fxjkoV dk dkjd mRikndrk vkj gky d o'kk e mRiknu ykxr e of) ,o fdlkuk vkj fey ekfydk l i;kIr xUu dk eY; dk u feyuk vkfn dkj.k gA

;g ,d ych vof/k dh Qly g vkj bl Hkkxkfyd fLFkfr;k d vk/kkj ij ifjiDo gku e yxHkx 10&18 eghu rd dh vko";drk gkrh gA bld fy, vkIr 21&27°C rkieku vkj 75&150 leh- o'kk d lkFk xe vkj vkn tyok; dh vko";drk gkrh gA Hkkjr nfu;k d lcl vf/kd xUuk mRiknd n"kk e l ,d g tkfd yxHkx 18-52 çfr"kr {k= dk doj djrk g vkj nfu;k d 18-45 çfr"kr xUuk mRiknu e ;kxnku nrk gA Hkkjr dk lcl cMk xUuk mRiknd jkT; mÙkj çn"k g ft ldk 2013&14 vkdMk d vulkj dy xUuk mRiknu e 38-61 çfr"kr fgLlk gA nlj ,o rhlj lcl cMk jkT; egkjk'V vkj dukVd ¼Mawla *et al.*, 2014½ gA Hkkjr d vU; e[; xUuk mRiknd jkT;k e fcgkj] vle] gfj;k.kk] xtjkr] vk/k çn"k vkj rfeyukM "kkfey gA

Hkkjr e xUu dh [krh ,d Jfed xgu çfØ;k gA fdlku e[; :i l ekuo "kfä ij fuHkj jgr g vkj xUu dh Qly d fy, ij Qly pØ e Je dh fujrj Hkkxhnkjh dh vko";drk gkrh gA —f'k {k= e Je dh deh vDlj egll dh tkrh gA mfpr etnjh ij i;kIr Je dh pkg d fy,] vf/kdk"k dk; lpkyu e njh gkrh g] ft ld ifj.kke Lo:i mRiknu vkj mRikndrk de gkrh gA ,lk vueku g fd] mRikfnr phuh d çfr ehfVd Vu ij 134 ekuo çfr ?kV dh vko";drk gkrh gA ble l ,d frgkb mRiknu d fy, vko";d g tcfd "k'k nk frgkb dk mi;kx dVkb] fNykb] lQkb vkj ynku d fy, fd;k tkrk gA blfy, xUu dh fNykb] dk e"khuhdj.k u doy mRiknu ykxr dk de dju d fy, vko";d g] cfYd euvy fNykb d dk;k e "kkfey ekuo n?kVuk dk de dju d fy, vkj x.koÙkk lfuf"pr dju d fy, Hkh vko";d gA Je dh deh ,d dkj.k g fd db fdlku bl Qly l nj py x, gA e"khuhdj.k d¨ Je dh deh dh leL;k dk gy dju d fy, ,d fodYi d :i e ekuk tkrk gA

ub vk; l tu d volj] xUuk d ek/;e l ink fd, tku dh t:jr gA ;g Hkfe m0kjd {kerk] c<rh mRiknu ykxr dk de dju] ck tkj l egxk vknku [kjhnuk vkj l;= iMh ç.kkyh fVdkÅ cuku e mi;kxh gA nfu;k dh yxHkx 80 çfr"kr phuh dk mRiknu xUu l m'.kdfVc/kh; vkj mik'.kdfVc/kh; tyok; e gkrk g] "k'"k 20 çfr"kr phuh dk mRiknu pdnj l çkIr gkrk g] tk T;knkrj mÙkjh xkyk/k d le"khrk'.k {k=k e mxk;k tkrk gA ¼Yadav *et al.*, 2002½ xUu d fy, ik/k dh jkikb] fujkb] dVkb] iÙkh gVkuk] c/kkb ,o ynkb vkfn —f'k dk; vkr gA fdlkuk dk vf/kdre Jfed "kfä] i;kIr /ku dh vko";drk gkrh g vkj ;g vf/kd le; yu okyh çfØ;k gA xUu dh dVkb] fNykb ,o <ykb dh çfØ;k e ge fofHkUu leL;kvk dk lkeuk djr g vkj ; vklkuh l gy ugh gkr gA

lkexh ,o ijh{k.k fof/k

mÙkj çn"k xUuk mRiknu dk çe[k jkT; gA xUu dh gkofLVx dk;okgh e xUu dh dVkb] fNykb ,o <ykb vkfn dk; vkr g D;kfd ble Hkkjh Åtk dh vko";drk gkrh gA mÙkj çn"k e xUu dh fNykb d rjhd e[; :i l euvy gA xUu dh fNykb d fy, fLVij dk fMtkbu vkj fodkl dk dk; mÙkj çn"k d ç;kxjkt fty d —f'k vfHk;kf=dh lHkkx] le fgfxuc,Ve ;fuoflVh v,Q ,xhdYpj VDuky,th ,M lkblt e fd;k tk jgk gA

xUuk fLVij e"khu d Hkkx

VDVj pfyr fLVij e"khu d fuEu Hkkx Ýe] gkij] LVhij jkyj] fLçx ykMM jkyj vkj ,;j Cykvj vkfn gA

euvy xUu dh fNykb

mÙkj çn"k e xUu dh fNykb d fy, LFkkuh; Lrj ij gkFkk l pyk;k tku okyk vktkj dk mi;kx djd ;k gkFkk }kjk eU;vy :i l iÙkh dh fNykb dk dke fd;k tkrk gA fdlku vkerkj ij xUu dh fNykb d fy, ykg l cu ijku fMtkbu d njkrh vkj pkd dk bLreky djr gA ¼fp= 2½] xUu dh gkofLVx e xUu dh dVkb] fNykb ,o xUu dk Åijh ¼iÙkh okyk½ Hkkx vyx djuk vkfn "kkfey gA gLr pfyr ;=k dk ç;kx ekuo d fy, dkQh ?kkrd ,o udlkun; gkrk g] tkfd ,xkukfeddyh vPNh ugh gkrh gA ft ll Jfed dk gku okyh n?kVuk vf/kd gkrh gA blfy, Jfedk dk ljf{kr :i l xUu fNykb d fy, fLVij dk ç;kx djuk pkfg,A

VDVj pfyr fLVij l xUu dh fNykb

xUu dh dVkb d mijkr iÙkh dh fNykb d fy, fLVij dk fodkl fd;k x;k g tkfd VDVj d ih- Vh- vk- i,oj l pfyr fLVij e'khu gA bl e"khu e xUu dh dVkb d ckn iÙkh dh fNykb d fy, xUu dk fLVij e"khu e yxk;k tkrk g tlfd xUu dk jl fudyu d fy, xUuk yxk;k tkrk gA e"khu e yx jcj d fQxj }kjk iÙkh dh fNykb dh tkrh gA bl e"khu e vkx ,o ihN fLçx ykMM jkyj yx gkr g ¼fp= 1½] tk xUu dk idMu ,o vkx c<ku dk dke djrk g vkj mij ,;j Cykvj yxk;k x;k g tk iÙkh dk gVku dk de djrh gA bl e"khu l Jfed dk gku okyh n?kVuk dk de fd;k tk ldrk g] vkj iÙkh dh fNykb de le; e fd;k tk ldrk gA ¼Suresh *et al.*, 2015½ bl e"khu dk ,d LFkku l nlj LFkku rd vklkuh l y tk;k tk ldrk gA ;g fdlkuk d fy, cgr mi;kxh lkfcr gkxhA

ifj.kke ,o foopuk

fNykb e yxu oky le;

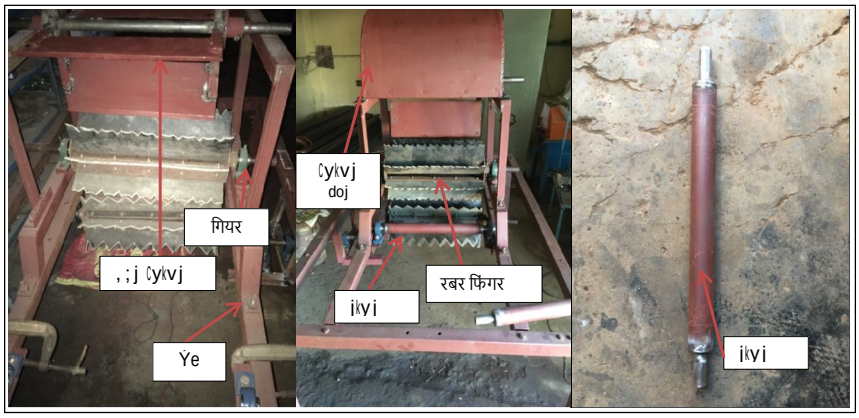
xUu dh fNykb e yxu oky le; dk Kkr dju d fy, LV,io,p dk mi;kx djd Qly dh fNykb e yxku oky le; dk ekik tkrk gA xUu dh fNykb dk dk; ;kf=dh ,o eU;vy nkuk fof/k }kjk fd;k tkrk gA euvy fof/k }kjk xUu dh fNykb dju l vf/kd ekuo "kfä] le; yxkrh g vkj n?kVuk Hkh vf/kd gkrh gA tc fd fLVij }kjk xUu dh fNykb e le; ykxr dh cpr gkrh g vkj e"khu e yx l¶Vh fMokbl }kjk n?kVuk l cpk tk ldrk gA

xUu dh fdLe

fLVij }kjk xUu dh fNykb e fuEu rhu fdLek dk fy;k x;k g tk fuEu çdkj l gA MCO-238, K-269 vkj R-94184A

xUu dh ekVkb vkj yEckb Kkr dju k

xUu dk Øe"k eU;vy :i l [krk dh fofHkUu ifä;k l



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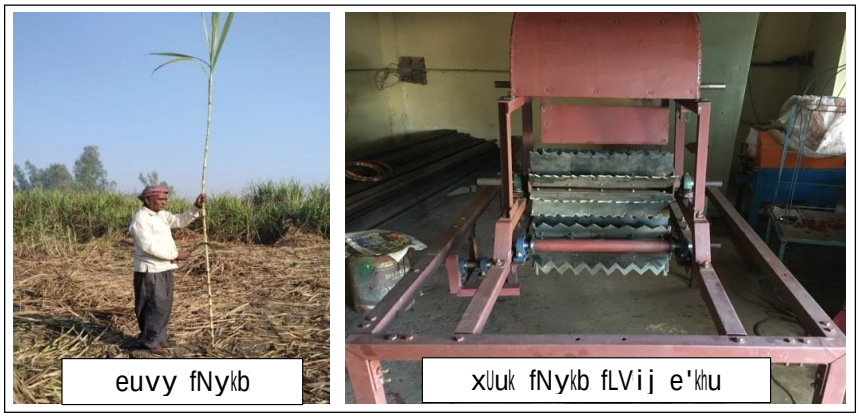

fp= 2% euvy ,o fLVij l xUu dh fNykbA

;k–fPNd :i l puk tkrk gA xUu dh yckb ekiu d fy, etfjx Vi dk ç;kx fd;k tkrk g rFkk xUu d 0;kl dk Ldy@ouh;j dfyi"k dk mi;kx djd ekik tkrk gA

xUuk fNykb {kerk dk fu/kkj.k

xUuk dh {k= {kerk Kkr dju d fy, dk;okgh e "kkfey dy {k= g tk fNykb e yxk dy le; ;kf=d vkj euvy fNykb nkuk ijh{k.kk d nkjku igy l gh ukV fd;k x;k FkkA ;kf=d vkj euvy nkuk ijh{k.kk e fNykb d fy, dy le; d lkFk fNykb d lpkyu e "kkfey {k= dk foHkkftr djd {k= dh dk; {kerk çkIr dh tkrh g ¼Pawar *et al*., 2005½A

{k= dh dk; {kerk ¼g-@?kVk½ =

$$\frac{\text{vkPNkfnr \{k= ¼g-½}}{\text{fNykb e yxk dy le; ¼?kVk½}}$$

ykxr dh x.kuk

;kf=d fof/k }kjk fNykb d vk/kkj ij dy fNykb ykxr e e"khu ykxr] Je ykxr rFkk xUu dk ykM djuk vkj ifjogu djuk "kkfey gA euvy xUu dh fNykb dh ykxr d fy, Je ykxr rFkk xUu dk ykM djuk vkj ifjogu djuk "kkfey gA {k= l m|kx dh njh d lkFk ifjogu ykxr fHkUu gk ldrh ¼Patel *et al*., 2018½ gA xUu dh fNykb ij dy Qly dh ykxr #-¾ xUu dh dVkb $ xUu dh fNykb$ ifjogu ykxr $ Je ykxr] vkfn "kkfey gA

ifj.kke

[kr dh {kerk

;g ,d gYdh vkj VDVj ih- Vh- vk- pfyr e"khu g ft l ,d LFkku l nlj LFkku rd vklkuh l y tk;k tk ldrk gA bl e"khu dk {k= e y tkdj {k= Vk;y 1 dh ;kf=d vkj euvy Qly dh {k= {kerk Øe"k% 0-171 g-@?kVk vkj 0-042 g-@?kVk Fkh] {k= ijh{k.k 2 e ;g Øe"k% 0-182 g-@?kVk vkj 0-049 g-@?kVk Fkk] {k= ijh{k.k 3 e ;g 0-178 g-@?kVk vkj Øe"k% 0-039 g-@?kVk Fkh] {k= ijh{k.k 4 e ;g Øe"k% 0-171 g-@?kVk vkj 0-045 g-@?kVk Fkh rFkk {k= ijh{k.k 5 e ;g Øe"k% 0-177 g-@?kVk vkj 0-041 g-@?kVk ik;k x;k FkkA

dy Qly dh ykxr

fLVij e"khu }kjk fNykb l dy fNykb ykxr e VDVj dh ykxr] e"khu dh ykxr] Je ykxr vkj ifjogu ykxr "kkfey g] tl fd fp= 1]2]3 e fn[kk;k x;k gA QhYM Vk;y 1]2]3]4 vkj 5 d fNykb e yxu okyk le; eU;vy fof/k l fNykb e vklr 726-8 g-@?kVk vkj fLVij }kjk fNykb vklr 31 g-@?kVk yxrk ¼fp= 3½ gA [kr dh {kerk eU;vy fof/k l fNykb e vklr 0-043 g-@?kVk vkj fLVij }kjk fNykb vklr 0-17 g-@?kVk ¼fp= 4½ yxrk g rFkk {k= ijh{k.kk dh euvy vkj fLVij dVkb e dy Qly dh ykxr eU;vy fof/k l fNykb e vklr 2575 # çfr Vu vkj fLVij }kjk fNykb vklr 1242 # çfr Vu ¼fp= 5½ gA

fopkj&foe"k

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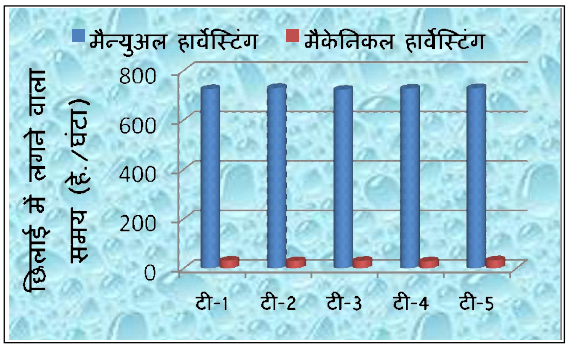

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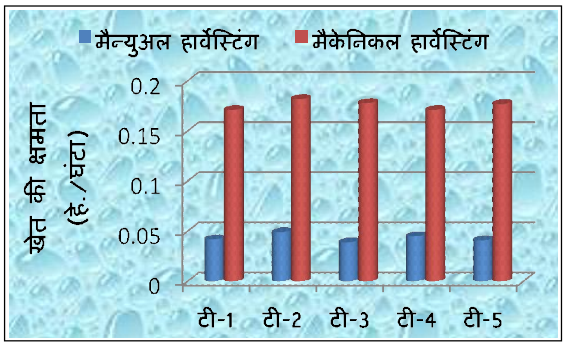

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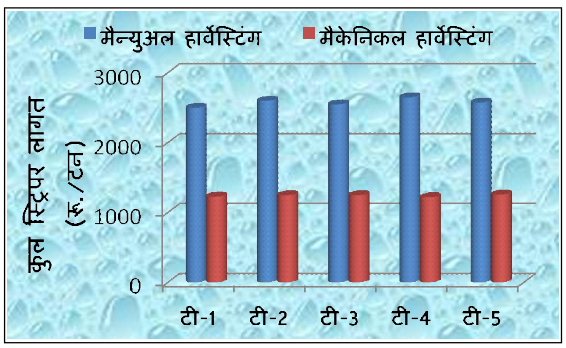

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dk;k e gku okyh n?kVuk dk de dju d fy,] vkj x.koÙkk dh mit lfuf"pr dju d fy, Hkh vko";d gA euvy vkj ;kf=d fLVij dk eY;kdu bld çn"ku dk tkuu d fy, fd;k x;k FkkA v/;;u l irk pyrk g fd Qly d fy, le;] {k= dh {kerk vkj xUu dh dy ykxr d :i e fuEukulkj fu'd'k fudkyk x;k gA

- e"khu d }kjk ,d gDV;j xUu dh fNykb e vkl ru 32 ?kVk@gDV;j dk le; yxrk g tcfd eU;vy fNykb e vkl ru 726-8 ?kVk@gDV;j dk le; yxrk gA
- ;kf=d fNykb d fy, çkIr {k= {kerk dk vkl r 0-17 gDV;j@?kVk rFkk eU;vy fNykb dk vkl r 0-043 gDV;j@?kVk gA
- Qly fNykb dh ykxr dk ikp vyx&vyx {k= ijh{k.kk l x.kuk dh tkrh g] ft le vkl ru ykxr 1242 # çfr Vu vkj eU;vy fNykb e vkl ru ykxr 2575 # çfr VuA

fu'd'k

v/;;u e ;g n[kk x;k fd xUu dh euvy fof/k dh ryuk e ;kf=dh fNykb l le; vkj Jfed dh cpr gkxh rFkk xUu d [krh d dk;k dk le; l lekIr fd;k tk ldrk gA bl e"khu }kjk xUu dh fNykb e gku okyh n?kVuk l cpk tk ldrk gA

1- fLVij l de le; vkj de ykxr e vf/kd xUu dh fNykb dh tk ldrh gA
2- bl e"khu dk mi;kx djd ekuo dk gku okyh n?kVuk l cpk tk ldrk gA
3- xUuk fNykb e"khu dk ,d LFkku l nlj LFkku rd vkIkuh l y tk;k tk ldrk gA
4- bl e"khu d ç;kx l xUu dh lhtu e Jfed dh deh l futkr ik;k tk ldrk g rFkk de le; e vf/kd xUu dh fNykb dh tk ldrh gA

lnHk

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