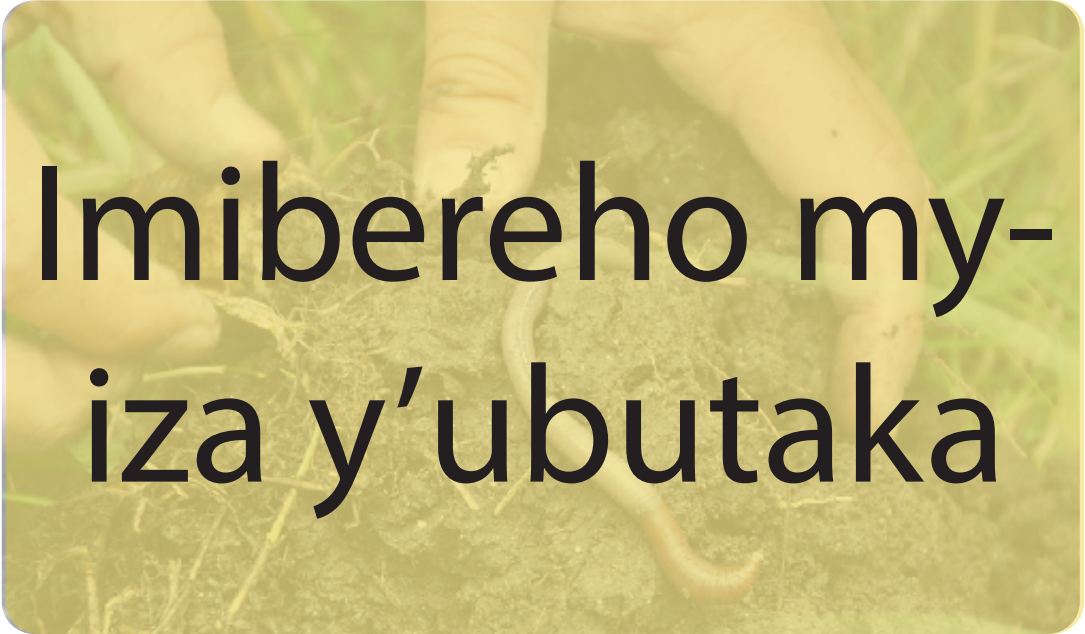
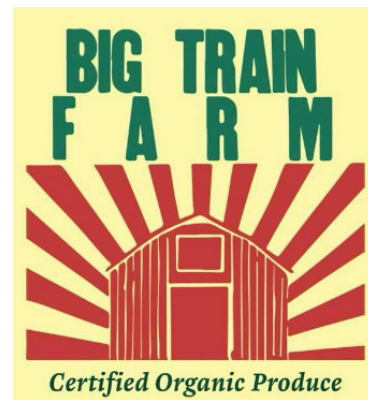




Imibereho myiza y'ubutaka

Produced through The Northern Rhode Island Conservation District's **Providence County Urban Growers Leadership Program**, in partnership with John Kenny from Big Train Farm.



Ibirimo

Ubutaka buriho 3 - 4

Ibintu 4 byo kuringaniza ubutaka 5 - 8

guhinga wubika Atari byiza ku
ubutaka 9

10

Haba iki iyo wuhiriye amazi
memnshi bikabije? 11

Haba iki iyo ukoresheje ifumbire
nyinshi bikabije? 12 - 18

Uguhinga mu matuta

Ubutaka buriho

Nkakurya kw'ikiremwa muntu, ubutaka burafite uruhu, uduce tw'amaraso, imiyoboro y'amaraso yose yuzuyemo udusimba duto cyane. Byose bidufasha kuyungurura ibifungurwa, biga kontrola ubuzima bwo mu mutwe, bigafasha imitsi yacu n'igikwankara, uko umuntu aba ari wese. Tubaho kubera utunyabuzima duto cyane tuba muri twe.

The soil is the same thing. A structure of non-living things that are a mesh of living ecosystems. There is a diverse array of micro organisms that live in the soil.

Urusobe rw'imizi y'ibimera: nirwo rugize uwo murwi w'ibinyabuzima. Nibyo bitanga bikongera bikaba ububiko bw'ibyo bita carbone nayo akaba arizo soko z'imbaraga y'urwo rusobe biduyemo

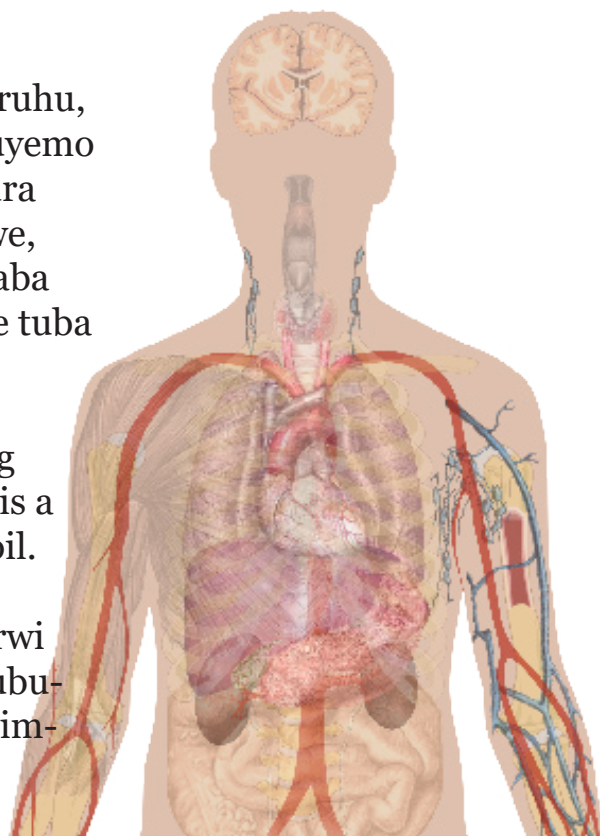


Image by Kelsey Amelia Bates

“Nshimikira ku gitekerezo cyuko bidashoboka gukura imizi mu butaka no gukura ubutaka aho imizi iri ngo uheze ube ugishoboye kuronka

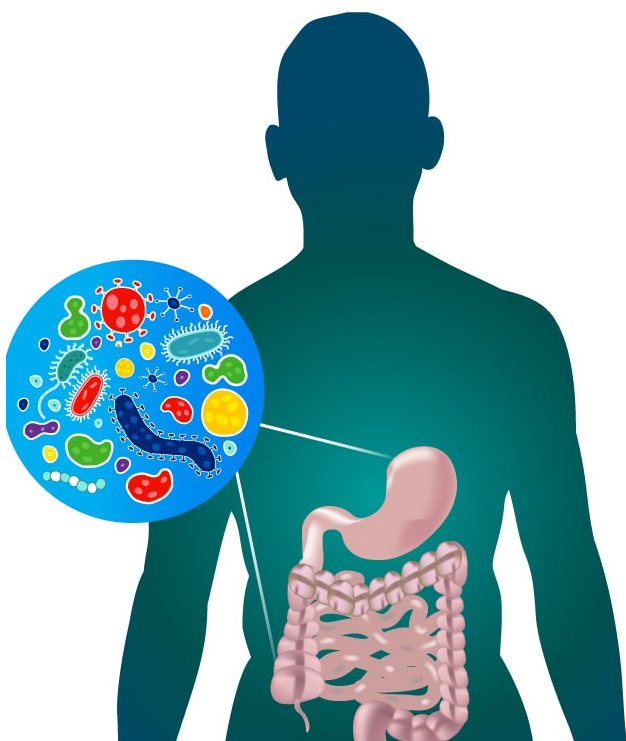
Ikibazo nyamukuru: ni gute twakorera mu butaka mu buryo bworoheje kugira duhinge/dusarure ibihingwa bizogirira akamaro keza ubutaka?

Twama dugerageza guha agaciro icyatuma ubutaka bumera neza.

Ubutaka bumeza nkakurya kw'amara munda y'umuntu. Ukuntu amara yubatse bitite ingaruka ku bice byose by'umubiri wacu kandi niho ibintu byose bikorerwa bigahinduka. Niba hari ikintu kitari cyiza ukoreye amara uzaba ugiriye nabi ubushobozi bwose bw'umubiri wawe.

Amara y'igingwa ari hanze y'imizi mu butaka. Nyinshi muri za mikorobe zitanga imbaraga n'ibirigbwa binyuze mu rusobe rw'imizi y'ibimera.

Tekereza kubyo dushira mu mubiri wacu biwugiraho ingaruka, niko bimeze no ku ubutaka. Ibyo ushira mu butaka bigira ingaruka ku ubutaka bwose n'ibibuhinzemo mu murima wawe kandi byose bikaba bigira icyo bikoze kugihingwa cyose



=



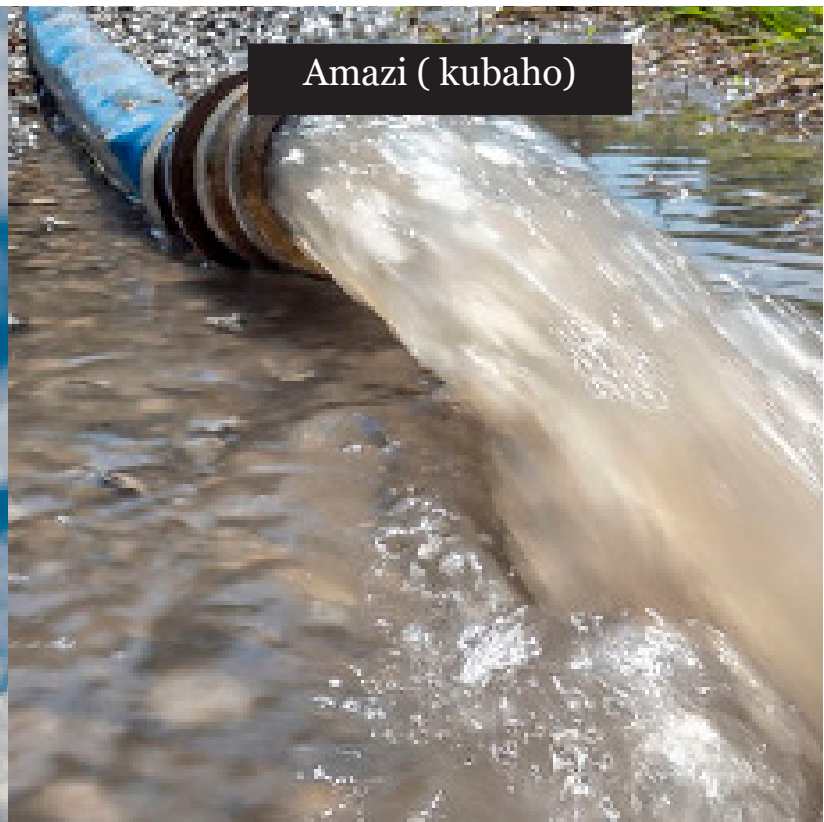
Image courtesy of norgenbiotek.com

Image courtesy of USDA

Ibintu 4 bikenewe kugira utunganye ubutaka:



Umwuka



Amazi (kubaho)



Ibyunyuny (gutanga ibiryo)



Ibintu nyabuzima, bizwi kandi nka carbone (ubuzima bwose bwubatswe na za carbone)

Images courtesy of USDA

Uko ibyo bine bitunganijwe biravana nukugene bikorana hamwe.

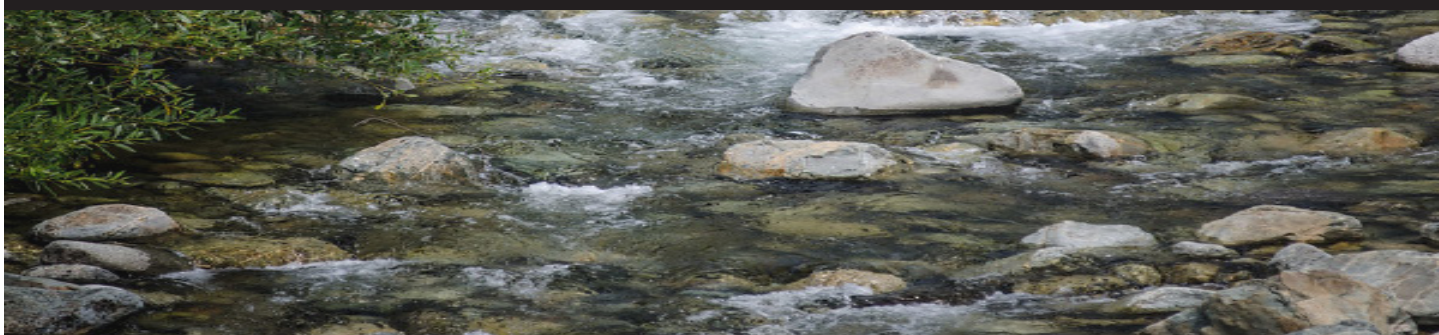
Bikenera ko ufasha ibintu bitandukanye bigize ubutaka bwawe.

Igihe turi gukora mu butaka bisaba ko dutekereza twiyumvira ibi bintu:

- Harimo mu butaka umwuka ukwiye kugira ibihingwa be na za mikorobi bihemuke?
- Hari amazi kugira ibihingwa na za mikorobi zinywe?
- Hari bimwe byitwa carbone kugira za mikorobe zironke aho zikura imbaraga?
- Ni ibihe byunyunyu biri mu butaka (ni ubuhe bwoko bw'ubutaka?)
- None izagira ingaruka nki ku umwuka mu butaka (harimo inzira aho umwuka wanyura mu butaka)?
- Ni gute bizagira ingaruka ku ubushobzi bwu ubutaka kukugumya (gufata) amazi ari muribwo?

1. Umwuka be na 2. Amazi:

Nkakurya kwi imizi, mikorobe zikenera amazi n'umwuka kugira zibeho.



3. Ibyunyunyu:

Ni kimwe mu bigize ubutaka kiba cyikoze kiva mu ibuye ryoroshye. Bivanye nuko iryo buye riseye neza uhita umenya ubwoko bw'ubutaka uko bumeze. Aha dutuye bita New England Ubwongereza Bushya hafise ubutaka bushya bugizwe n'umucanga kubera ubutaka ari bushya buturutse ku ibibuye by'amazi bikoze mu rubura rwaje mu myaka yashiye byashizwe ku ubutaka (byasizweho) igihe ibyo bibuye bya amazi byahagarikirwa muri New England.

Ibuye riri aho dukura ibyunyunyu bigaburira ibimera ibihingwa. Za mikorobe zikora na na ubutaka (ibigize ibuye ryoroshye) zigakuramo ibyunyunyu hanyuma zihabihindura kugira imizi ishobore kubigeraho mu ubutaka.

Za mikorobe zituye hamwe n'ibinyabuzima kandi zikanatura muri byo, zikavunagura ibinyabuzima byo mu ubutaka imbere mu ubutaka. icyo gihe nyene zinjiza zongera umwuka mwiza bita oxigeni muri rya buye ryoroshye riri mu ubutaka kanzi zikarikuramo ibiribwa. Imizi y'ibimera ibihingwa arakira ibiryo za za mikorobe ziba zakuye mu ubutaka.



4. Ubutaka bw'ibinyabuzima:

Za karubone ziba zavuye mu ibintu byapfuye hanyuma bikabura. Urugero: Irigi be n'uruho rw'umuneke birabura aho baba babishyize babirunze ku kirundo. Ibintu byose bibikoze birabivamo bikavangana hamwe bikavamo ibintu bifatanye bikaba ikirundo, byitwa ibinyabuzima.

Uko uagenda ubona urugero rukenya kw'ijana rw'ibinyabuzima, ninako usanga mu butaka imibare ya zamikorobi zirimo ari mike cyane. Iyo ufite ibinyabuzima byinshi mu ubutaka, ushobora gusangamo za mikorobe nyinshi cyane zishobora gutindisha cyangwa kunyarutsa uko ibiryo by'ibihingwa ibimera bitinda cyangwa bikanyaruka kuboneka mu ubutaka. Ibiryo byinshi cyane biri mu ubutaka icyarimwe mu gihe kimwe bishobora gutuma ubutaka butagira uburinganire bijyanye ni ibiryo. Ibice 6 gushika kuri 7 ku ijana by'ibinyabuzima mu ubutaka ni urugero rwiza kuko ubutaka bwa hano muri New England bukunze kuba bya kama ari ubutaka bwa umucanga.

Karubone rero iba yavuye mu ibinyabuzima niho mikorobe zivana inguvu imbaraga zazo. Ibimera kandi iyo bihinduye umwuka mubi muri mwiza bikoresheje ibyo bita photosynthese nabyo birahaza bikarekurira karubone mu ubutaka.

Ibintu bine by'ibanze Four Basic elements to balance:
[umwuka, amazi , ibyunyuny, ibigize ubutaka kama
("ubuzima")]

Ibice 44-43% by'ibyunyuny
bikorehwa n'ibihingwa binyuranye

- Ibintu kama bikoze ubutaka
- Ivyobiongeramo(udusimba two mw'ifumbire)

Ibice 6%-7%
bigize ubutaka
kama

Za bacterie, fungi,
nematodes,
protozoa, rotifers,
udusimba,
ibitaganurirwa,

Umusenyi, silt,
ibumba

Ibice 25% by'umwuka / bice 25% by'
amazi

Biguma mubutaka kubera
bukomey (likoze ubutaka kama
birenga 6%, amatuta maremare
arambuye

Ifumbire nke
Ibihingwa bipfutse (imizi)
Ibihingwa byo gucuruza
(imizi)

Umwuka Nitrogen ,
Umwuka mwizaoxygen ,
umwuka mubi gaz
caronique , umwuka uva
mu mazi. etc.

Ingeso nziza zo
gukoneza/Kugumya ubutaka
bumeze neza:

- Kudahinga ubutaka kudahindukiza ubutaka
- Kugumiza imisi mu kuzimu
- Gusasa ibyatsi, gushyiraho ifumbire
- Root systems in place
- Gushira umu butaka udusimba (Inyo.udusiba)

Guhimiriza guhinga ku matutat

- Ikena y'yukwegerana kw ubutaka. (nta ma pine/ ibirenge)
- Ubutaka bufise imbarafa (ukuntu biba bihagurutse bakomeza ubutaka)

Kugumizaho amatuta arambuye:

- Gukora kubutaka atambaraga nyinshi (rato, ahantu hataari hagari/guhiga bitaruhije, n'ibindi)
- Gufuka ibihingwa, ibyasigaye, birangizwa n'ibintu bifiuta aho bihumekera
- Ama mashini ahinga aronka aho nyura kugirango: gukura ibyatsi, gushiraho ifumbire, kuringaniza ubutaka na rato/gushwanyaguza, gutera imbuto, gutera imibyaro, n'ibindi
- Gufuka ibihingwa igihe cy'ubukonje, ibyatsi, igitambara cyo gufuka (30'X150')

Gushiraho
ibyatsi be
n'ifumbire
kama
bigizwe
m'ibintu

Kubera iki GUHINGA UZURA UBUTAKA BITARI BYIZA kugira tugumane ubutaka bu-meze neza birimo ibiringaniye.

Iyo uhinze ukazura ubutaka uba:

- urico wongerea umwuka mu ubutaka
- Amazi aba yagumijwe mu ubutaka agakama
- Amoko ya zamikorobe akagabanyuka (amoko amwe amwe agapfa, andi agakura, bigatuma havuka ubwoko bucyeye bwa za mikorobe)
- Ibinyabuzima biri mu ubutaka biragabanuka, ya karbone nayo igahita iribwa byihuse mu ubutaka na za mikorobe ziyongereye
- Ibyunyunyumu mu ubutaka niracagagurika hanyuma bikayonga (bishobora gucangana na amazi bitaruhije) hanyuma amazi akabijyana kure bigatuma bikena bibura.

Guhinga uzamurira ubutaka nka igihuhusi, ibintu byose bihita bitakaza urugero rwabyo hakavuka akajagari. Bihita bituma ubutaka buba:

- utamenya uko ubutegekanya
- utabwizera bikwiye
- Bukagorana kugira bwongere kuba neza uko bwahose





Ni igiki kiba iyo hari amazi menshi arengeye urugero

Iyo ugiye mu murima/mu busitani ukavomera amazi gushika aho haba ikidengeri ikiziba, nta/ntana akuka nagato kaba mu ubutaka. Imikorobe ziri mu ubutaka zirahinduka uku:

- Zimwe zishobora guhumeka ziri mu amazi zigakomeza zikabaho
- Zimwe ntizishobora guhumeka mu amazi hama zikarohama
- Zimwe ntizishobora guhumeka mu amazi hama zikaryama zigasinzira

Izo mikorobe rero zishobora kwoga mumazi cyangwa zigahumeka zihita zihindura imiterere ya ubutaka zigatuma ubutaka butakiba bubaho butandukanye bikwiye. Bizatuma uburyohe buri mu ibinyabuzima bumanuka musu.

Ubutaka butose cyane butuma ibiryo birimo buzamuka nk'umwuka ukabona imyuka izamukamo izamukana uduce twa ibyari bisanzwe mu butaka bikajya mu kirere.





Ni igiki kiba iyo ushyize ifumbire ri- renze urugero mu ubutaka?

Image courtesy of ohsonline.com

Ibintu byo gufumbira bias nka aho ari imyunyu.

Iyo ushyize umunyu mwinshi mu ubutaka bigira ingaruka ku amazi na za mikorobe ziri mu ubutaka mu:

- Kugabanya amazi ari mu ubutaka (umunyu unyunyuza amazi)
- Kwumisha ubutaka
- Kwica zamikorobe zo mu ubutaka cyangwa ugatuma zisinzira.
- Kugabanya mikorobe zikora ibiryo byo mu ubutaka kandi bikanatuma zishiramo.



Image courtesy of UGA Cooperative
Extension

Guhinga mu Amatuta



Umurima Big Train Farm warahinduye ubutaka bwawo bahingamo uhinduramo amatuta hejuru ya ubutaka (bahinga mu ubutaka).

Ayo matuta ameze nka udusozi dutoduto ku ubutaka.

Kuva bashizeho ayo matuta, ntakindi kintu bakoresha, cyangwa ikintu kindi gikomeye cyashobora guhungabanya guhutaza ubutaka.

Intego yo gukomeza amatuta afite ubutaka buringaniye ni ugukora ukuntu buhingwaho neza. Ubutaka buhinze neza ni ubutaka burimo umwuka na amazi biringaniye (ushatse ushobora kwinjiza intoke mu ubutaka kandi bukoroha.

Urugero: Ukandagiye ahantu hatuye ubushishi ushobora gusambura imyobo yabwo, ugafyatarika inzu zabwo ugashobora no kubwica bibaye uko. Uba uriko urakora cyokimwe iyo ukandagiye ku ubutaka. Uba uzibiye udutoboro duto twa umwuka mu ubutaka, ugatuma ubutaka bukomera nabyo bigatuma ubushobozi bwabwo bwo kugumya amazi bugabanuka, bikanashobora gutuma zamikorobe zagirira neza ubutaka zipfa mu ubutaka.

Mikorobe zongera kugendagenda zikongera gutunganya bushya inzira zanyuragamo na aho uko mu ubutaka hari hubatse. Mikorobe zishira hamwe ibinyabuzima be na ibyunyunyu bigakora icyo bita Soil Aggregates urunani rw'ubutaka. Iyo bibaye uko ngu uko, ubutaka buhita bugira ibukoze bitandukanye. Uko ubutaka buba butandukanye niko burushirizaho kubamo inzira nyinshi zokunyuramo hakanaboneka kurushaho aho umwuka unyura na amazi akagumamo, nabyo bigatuma za mikorobe zishyigikirwa mu ubutaka.

Mu menye neza: Ibihingwa ibimera bitandukanye bituma haba za mikorobe zitandukanye mu ubutaka nabyo bituma haba uburinganire mu ibigize ubutaka nu ubutaka.

Umwuka ugumizwa mu ubutaka nuko atabikoresho bikomeye/ bifite imbaraga bibukandagiraho (bikora ahari amatuta atacyo byangiriza uko bishoboka kwose). Bituma amatuta akomeza kuguma yoroshe kandi apfunguye ku uburyo umwuka ubunyuramo atakibazo.



Uturingoti udufurege tuba turi haruhande rwa amatuta turatuma amazi ariho atega hanyuma ahazafata igihe cyo kumanuka mu ubutaka. Ibyo bituma ubutaka bwo ku amatuta butabamo amazi menshi ngo butote cyane. Bifasha ko amazi ataba menshi utabyifuje.

Image courtesy of USDA

Kunera ukuntu ubutaka buba bwubutse, uburinganire bwiza bwu ibinyabuzima biburimo, be na inzira nziza zituma amazi na umwuka bigumana uburinganire, amatuta aba afite impamvu nkenya zo kwuma (no mugihe haba haka izuba ryinshi).

- Amakaroti bayavomera kabiri mukwezi kwa 7 hafi amasaha 1.5
- Ibyo babadika bahinga ari ingemwe nk'urugero imboga bita letue, izo bita fennel, leeks...n'izindi zikenera kuvomerwa ukizibadika kugire zihite zimenyera ubutaka zidahangayitse.
- Ama pilipili na amatomati inyanya birashobora guhunganywa gatonya na izuba ryinshi ugereranije na igihe ubutaka buba butarimo ibiringaniye.

Gukora amatuta:

- Usubira inyuma mubyo ibanze (usuzume neza ko wongeyemo ibinyabuzima nk'ifumbire, usuzume ko ubutaka buhwemuka butafatanye cyane, usuzume neza ko arimo imizi myinshi ishoboka ya ibimera ibihingwa.
- Abo ku umurima Big Train Farm bakoze amatuta yabo bakoresheje ibikoresho bikomeye kandi biremereye (imachine irima bita chisel plow) kukubera bahinga ahantu hagari. Ku ahantu hato, amatuta nka ayo urayakora ukoresheje igipahu igitiyo hanyuma ugacukura ukimba bukebuke ikoresheje igitiyo bita ikanya kugira worohereze ubutaka aho umuyaga umwuka unyura.
- Kurima ubutaka ukoresheje isuka (mu umurima Big Train Farm bakoresheje imachini yitwa Herrow, nayo ikaba ari isuka rigari) kugira ubutaka umuntu ashobore kubuhingaho bitaruhije.
- Mukuringaniza neza amatuta bakoresheje igipahu igitiyo (mu murima Big Train Farm bakoresheje imashini nini ibigenewe)



Kwitaho amatuta:

- Ifumbire (kuyongera ku amatuta)
- Gufuka ukoresheje ibimera (guhiga ibimera ariko Atari ibyo gusarura kugira ubutaka bukomeze kumera neza)
- Ibifumbizo bongera ku ubutaka ntibiba ari umunyu ahubwo ni ibifumbirisho bigizwe na ibinyabuzima. (urugero: guhuheraho amazi y'ifi, kumija ho ifu y'ibyo bita alfalfa, ifu ya isoya, ibyo bita blood meal, na ibindi....) ku umurima Big train Farm bakoresha ifu ya alfalfa . Ibifumbirisho Fertilizers babikoresha kugirango batume za mikorobe ziba nyinshi (kugwiza za mikorobe).
- Gufasha mikorobe ufasha ubutaka.
- Gukoresha imashini isanza ifumbire (imashini yo gusasa ifumbire) igihe hatangiye gukanya bita fall



Gutegura ubutaka uhingamo:

1. Guharura ibyatsi ukoresheje imashini Mower (Ibikoresho byose biba bifite amap-
ine imitambo anyura hagati ya amatuta) ikata ibihingwa baba bahinzeho ngo bifuke
ubutaka. Ibyo biba bifutse ubutaka biba bikiri bizima.
2. Koresha Igitambara kinini Gifite Intoboro mu gufuka amatuta.
Igitambara kinini Gifite Intoboro mu gufuka amatuta gikozwe muri plastike, kijish-
we ku uburyo umwuka na amazi bishobora kukinyaturamo, mugabo zitagutse.
3. Inyuma ya ibyumweru bitari bike bya bihingwa bya ibimera baraheza bigapfa musi
ya cya gitambara hanyuma rero ukakivana kuri ya matuta.



4. Nyura mu umurima ikoresheje rato kugira uvaneho amababi ya bya bimera yapfuye
yaba yahasigaye ku matuta. the dead cover crops.

5. Koresha imashini ifite ama rato (uku si uguhinga, ratpo zisunika ubutaka ku ruhande nayo ari uguhinga barazamura bakubika ubutaka) kugira ngo baringanize ubutaka now ku amatutata. Igihe bari gusanza ku amatuta bakoresha rato, hari ibyuma imbere ya za rato za iyo mahini ziheza zigacukura zikimba ubutaka ahagutse ubugari bungana na inches 2 na hafi inches 2 kugeza kuri 3 ujya musu. Ibyo byuma bitegura umwanya ikibanza mu ubutaka ho kubadikamo ingemwe. Aiyi machine ifite za rato na ibyo byuma bicukura irafasha cyane mu gihe bari gukora ahantu hagari bahinga ibyo gucuruza. Ukwo ni uburyo bumwe bwo guhohotera ubutaka ariko bituma umuntu adatakaza umwanya cyane cyane iyo bahinga ahantu hagari kubwo ubucuruzi. Ubwo buryo bwo gukoresha rato butuma za mikorobe ziba ziriyamye mu ubutaka zibyuka zikava mu bitotsi. Umusaruro w'ibyo bahizni ntabwo uhungabanywa na ibikoresho bito bito baba bakoresheje.



6. Ubutaka babufumbiza ifu ya alfalfa kugira za mikorobe zigendagende mu ubutaka kugira zikore akazi kazo igihe cyo guhinga.
7. Gutegura imibyaro yo kubadika mukuyibombeka gutubika igice c'imizi mu muti wa amazi. Kubombega bikorwa mu muti wa amazi bita fertilizer ukozwe mu inyo zo mu ifumbire. Ayo mazi aba yavuye mu inyo aba arimo mikorobe nyinshi cyane (ibi ntabwo ari ifumbire ya icyayi. Ifumbire ya icyayi iba idafatanye umwuka uyinyuramo). Mibyaribayishira kuri za plateau zibigenewe nazo bakazinjiza mu kintu igikono kirimo wamuti bagatumbikamo mu nyuma bakajya kubadika imibyaro mu umurima.
8. Gukresha imashini bita Transplanter Machine (abantu babairi bicara inyuma hanyuma imashini igakora utubanza abantu nabo bagashira imibyaro muri nyatubanza imahini icukura mu ubutaka.



Imashini Transplanter Machine ni iyi ngiyi isa na icyatsi kibisi!

Ni igiki kiba nyuma yo gusarura ibyo bahinze?

Bakoresha imashini ihwahutse itaremereye igakwega ubutaka muri twa turingoti twa dufurege hanyuma bagahingamo ibimera byogufuka amatuta (imvange ya imboga na ibyatsi)

Gukata / gusarura imyaka (bituma imizi ya imyaka ipfa hanyuma mikorobe zinyuranye zigakora akazi kazo mugutemagura ya mizi yapfuye)

Ibimera byo Gufuka babyongeraho aho basauye imyaka kugira basubizeho imizi mizima ku amatuta kugufasha za mikorobe kugaruka mu ubutaka kugira zitume ibiryo na ibyunyumu biboneka mu ubutaka.

