




Chimborazopi Tiyak Wayku Yaku

Programa Nacional
de Forestería



Hatun uchilla
yurakuna
Ñukanchik chiri
llaktakunata
allichinkapak Kay
uchilla waykukuna
Alli paktachunpash,
alli charinkapakpash



Kamuta ñawirikkuna:

Comité de Publicaciones. Estación Experimental Santa Catalina, Revisión Técnica de la versión en Español: Luis Rodríguez, Esteban Falconí, Iván Reinoso, Marcelo Racines.

Kichwaman tikrachikkuna: Cristobal Quishpe, DIPEIB-P.

Andrés Telenchano, Antonio Ati,
Programa de Forestería

Ilustraciones: Paola Lagos

Imkamuyachik hillay:

NINA Comunicaciones, 2 526 924,
Quito – Ecuador.

Boletín divulgativo N° 395

Instituto Nacional Autónomo de Investigaciones Agropecuarias

Estación Experimental Santa Catalina
Panamerica Sur Km 1, Quito Ecuador
Karu uyari – karu killkak + 593 -2-2 690 692
Zirna: www.iniap.gob.ec

Rikchakkuna:

Archivos fotográficos del
Programa Nacional de Forestería.

Cay rurayca kashnami riksirinka:

Grijalva J., Riofrío J., Andrade D, Ramos R. 2010. Hatun uchilla yurakuna ñukanchik chiri llaktakunata allichinkapak kay uchilla waykukuna alli paktachunpash, alli harinkapakpash. Chimborazopi Tiyak Wayku Yaku. Trad. C Quishpe; A Telenchano; A Ati. Quito, Ecuador, INIAP, Estación Experimental Santa Catalina, Programa Nacional de Forestería. 20 p. (Boletín divulgativo no. 395).



IMALLA TIYASHKATA RIKUCHI

| | |
|---|----|
| Kallari rimay | 1 |
| Maypitak kay llankayta paktachin | 2 |
| Llaktakunawan tantanakuypi yallichishka yurakuna chikan, chikan ruraykunapak..... | 3 |
| May uchilla waykupi hatun uchilla yurakunata yachakchayashka | 4 |
| Imalla ruraykunata yallichishka | 7 |
| Chikan, chikan waykukunapi yurakuna tiyakmanta muyukunata llukshichishpa rakina | 8 |
| Hatun uchilla yurakunapak muyukuna | 9 |
| Ima killa, sisan, muyuta kun tantayta ruranapak rikuchikunchilla, hatun yurakunamanta pacha | 11 |
| May uchilla waykupi hatun uchilla yurakunamanta alli muyukunata tantashka | 12 |
| Uchilla hatun yurakunata murukunawan tantachishpa ruraykunata paktachishka | 13 |
| Achka carbono shinallatak biomasa wakichi | 15 |
| May uchilla waykupi kay yurakunaka imalla paktachikunatak ruran | 16 |
| Kay yurakunata chimpapurachi, llaktapi tiyak kiwakunawan imallata charishkakunata rikuna | 18 |
| May uchilla waykupi yurakuna imalla paktachikunata yanapan | 19 |



KALLARI RIMAY

Puna suyupi tiyak llaktapi kawsakunaka, achka sinchi llankaykunata rurashpami shamunkuna, tukuy kay mama pachapi tiyashkakunatapash llakichikunkunami.

Chaymantami kay llaktata pushakkunaka achkata mancharishpami, imashina kay llakikunata, shinallatak paktalla kachumpash, kipa punllakuna ama llakikunata charinkapak, ashtawankarin kikin ayllu llaktapi paktachikuna, llakikuna, llankaykuna, urkukunapi tarpuykunapash ashtawanmi mirarishpa punllanta rikun, tukuy llaktakunapi, kimsa chunka kanchis watakunapi tukuy kaypi tiyashkakunami wakllirishpa shamushka, shinallatak tukuy urkukunapimi llankayta kallarishkakuna.

Tawka ayllu llaktakunami paykunapak murukunata pukuchinkapak hapishpa charinkuna, shinallatak mapayachinkunapash. Ashtawankarin, hatun llaktapi, llaktakunapipash achka llakitami yurakunata pitishpa shamunkuna, mana charinkunachu ima shina yurakunata pitishpa, tarpuna, kipa shamukkunapak chariranamanta, shinapash mana tiyanchu sinchita pushakkuna paktata yachachikunapash imashina ñukanchik pacha mamata chariranamanta. Llaktapi kawsakunaka yurakunamanta muyukunamanta ñawpa imalla yashashkakunata runakunapura sinchiyachinakunapak wankurishkakunami.



May uchilla wayku kinraykunapika alli allpa chinkarikunatami charinchik, yurakuna mana tiyashkamantami punllanta punllanta wakllirishpa katinka.

Ñukanchik ayllu llaktakunapak tukuy kay waklliri shinallatak wakchayarita tiyakta rikushpami, Programa Nacional de Forestería del INIAP; kay llankaykunata paktachishpa shamun, imashinami yurakunata allpakunapi ima shina wiñashpa riktapash rikunkapak, kipa punllakunata ñawpa pachakuna imalla ruraykunata paktachishkata kutin paktalla katinkapak, kipa punchakuna sumak kawsayta charinkapak, uchilla wayku yakukuna ama chinkarichunpash.

Kay kamutaka ayllukunapura karanakunkapak may uchilla waykupi tiyak llaktakuna, shinallatak INIAP PROGRAMA NACIONAL DE FORESTERIA tantanakushpa kay llankaykunata paktachikunkuna.

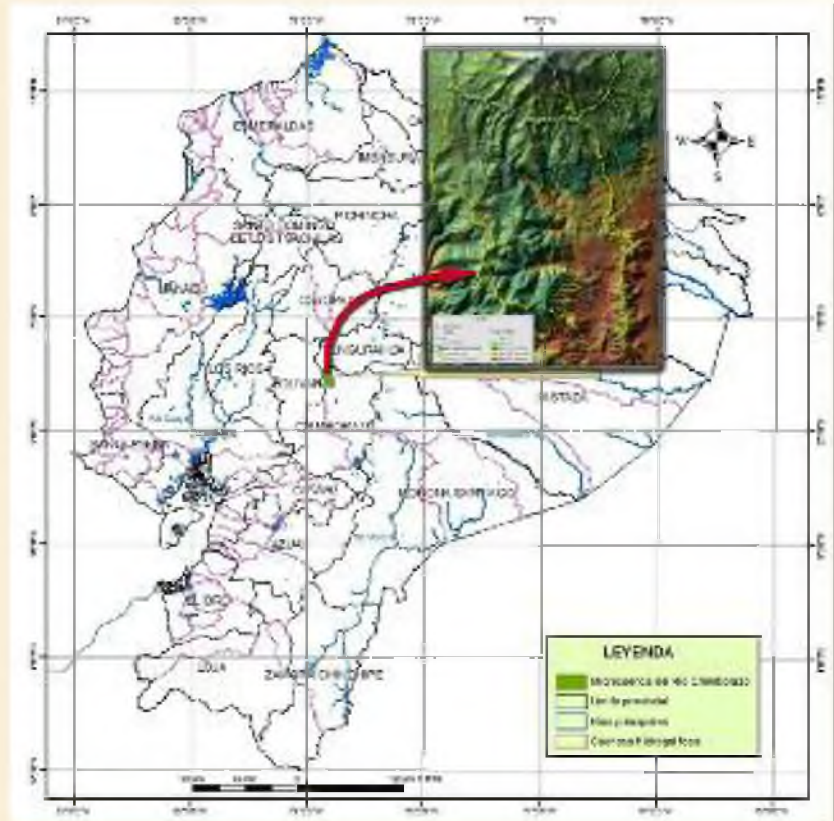




MAYPITAK MAY UCHILLA WAYKU YAKU SAKIRIN

Kay uchilla wayku pukyukunaka sakirinmi kunti-suyu lluki maki chaupipi, Chimborazo marka, Riobamba kiti. Shinallatak San Juan hatun ayllu llaktapi, Chibunga mayu, Chambo mayuwan tantachishpa Pastaza hatun mayu tukunmi. Tukuy kay allpa pacha kunaka 12491 ha kanmi, kayka 3200 manta 6300 kama wichiman rinmi mama yaku pampamanta. Kay allpakunaka tiyuwan turuwan chapurishkami kan, shinallatak urkukuna tukyashkamanta uchpa urmashpa chapurishpa achka alli allpakuna tukushpa tiyan, (2-9%) wanutami charin, shinallatak Ph nishkatapash mana pichillata ni ashkatapash charinchu, ashtawankarin nitrógeno, fosforo nishkatami pichillata charin, potasio nishkatami achkata charin, kay may uchilla waykupika (1.100mm) watapi tamyán, shinallatak ñukanchik ayllu llaktapi chirimanta kunuk kama chawpiyachishkaka kanmi 10 °C shinapash achka chiripash tukuy tukunmi kasapash urmanmi.

Ñukanchik ayllu, llaktapi kawsakunaka yallika runakunami PURUHA yayakunamanta wawa wawakunami, shinaka mama llaktapa kichwa runakunami kan. San Juan hatun ayllu llaktaka charinmi chunka waranka runakunami kan. Kay llaktaka ishka hatun runakuna wankurishpa tantanakuyta apakkunami tiyan UCASAJ (Union de Comunidades campesinas de San Juan), Shinallatak FOCIFCH (Federacion de Organizaciones Indigenas Del Faldas de Chimborazo).



Kay ayllu llaktapi kawsakunaka muru, wiwatami yallika mirachinkuna chaymantami kiwata yallika tarpunkuna shinallatak papa, haba, cebada, shuktak murukunatapash, paykunapak kawsay alli kachun charinkuna.





LLAKTAKUNAWAN TANTANAKUYPI YALLICHISHKA YURAYKUNA CHIKAN, CHIKAN RURAYKUNAPAK

1 Llaktapi kawsakunawan wankurishpa imalla yurakunata yallichishka tukunchin, shinallatak mirachi tukunchikpash alli llankaykuna paktachun tantanakuypi rimanakuy.

2 May uchila wayku ayllu llaktakunapi alli muyukuna tiyashkata akllashpa saywachishpa yallichina.

3 Ñawpa yachaykunawan kunan yachaykunawan paktalla yallichishpa muyukunamanta yurakunata mirachinapak.

4 Tantashka Muyukunata kamaykuta paktalla alli mana alli kashkatapash rikunkapak shinallatak tulukanchapipash yallichishka.

5 Alli muyukuna tantashkata llaktapi tiyak tulukanchapi mirachi

6 Mayllapi murukuna tarpuna allpakunata yallichishka uchilla hatun yurakunata tarpunapak ayllu llaktakunapi shinallatak ayllupurapipash.

7 Imashina yurakunata alli charinata yachachi shinallatak imallata ruraytukunata paktachitukukta yachay.



Chiniwa llaktapi imalla yurakunata riksishkata shinallatak munashkatapash rurayachay.



UCASAJ – INIAP. Tulukanchapi yurakunata mirachikuna.





MAY UCHILLA WAYKUPI HATUN UCHILLA YURAKUNATA YACHAKCHAYASHKA





LLIN LLIN

(*Senna multiglandulosa*)



KULLA

(*Buddleja coriacea*)



PUCA MALVA

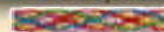
(*Lavatera assurgentiflora*)



YANA CHILCA

(*Baccharis latifolia*)

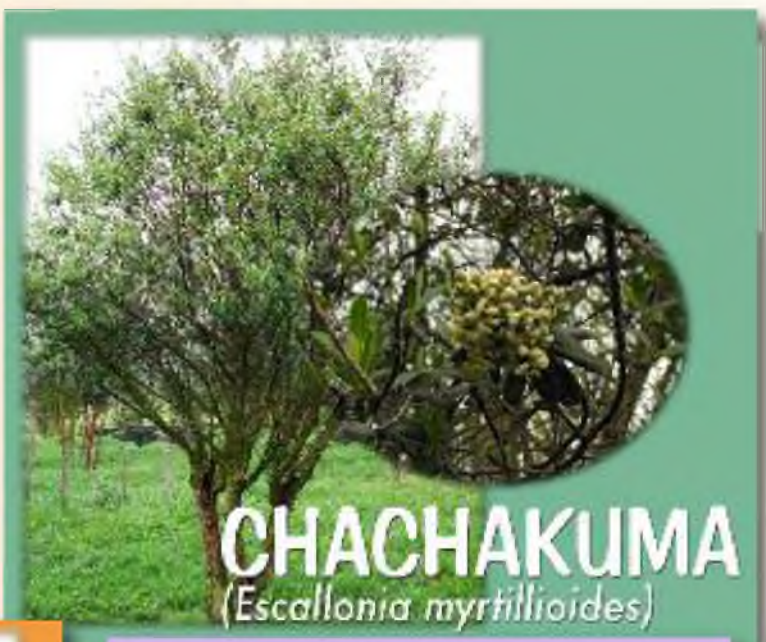
Hatun uchilla yurakuna 5





PUTAK

(*Salvia macrostachya*)



CHACHAKUMA

(*Escallonia myrtilloides*)



PIKIL

(*Gynoxis sp.*)



WANTUK

(*Brugmansia arborea*)

6 Hatun uchilla yurokuna





LLAKTAPI KAWSAKUNA IMALLA RURAYKUNATA YALLICHISHKA

| Imashina katin | LLAKTA | RIKUCHIKKUNA | |
|----------------|--|--------------|--|
| 1 | Yawal, Yagüil (<i>Polylepis racemosa</i> H.B.K, <i>P. incana</i> K., <i>P. sericea</i> W. P. <i>Ianuginosa</i> K., <i>P. reticulata</i> H) | | <p>Llaktapi kawsakkunaka kai ruraikunapakmi yurakunataka charin</p> <ul style="list-style-type: none"> yanta tawka murukunata tawka ñawpa pacha hampikuna maki ruray wiwakunapak kiwa suma pachata rikuchin Yurakunamanta tullputa llukshichi yaku wayku pukyukunatapash harkachina sumak rikuykunata rurana Chikan, chikan ruranapak kaspikuna Pichanata rurana wiwata watana, wakrawan yapunapak kaspi rurana muyuta tantana |
| 2 | Puka (<i>Lavatera assurgentiflora</i> K.) | | |
| 3 | Tilu (<i>Sambucus nigra</i> L.) | | |
| 4 | Kishwar (<i>Buddleja incana</i> R&P.) | | |
| 5 | Lupinu (<i>Genista monspessulana</i> L.A.S) | | |
| 6 | Llin – llin (<i>Senna multiglandulosa</i> J.H.S., <i>Senna</i> sp) | | |
| 7 | Pikil (<i>Gynoxia halli</i> H.) | | |
| 8 | Kulla (<i>Buddleja coriacea</i> H.B.K.) | | |
| 9 | Putak (<i>Salvia macrostachya</i> K.) | | |
| 10 | Chilka (<i>Baccharis latifolia</i> R&P. P.) | | |
| 11 | Wantuk (<i>Brugmansia arborea</i> L.) | | |
| 12 | Chachakuma (<i>Escallonia myrtilloides</i> L.F.) | | |



HATUN UCHILLA YURAKUNAPAK MUYUKUNA



Kishwar



Llin llin



Kulla

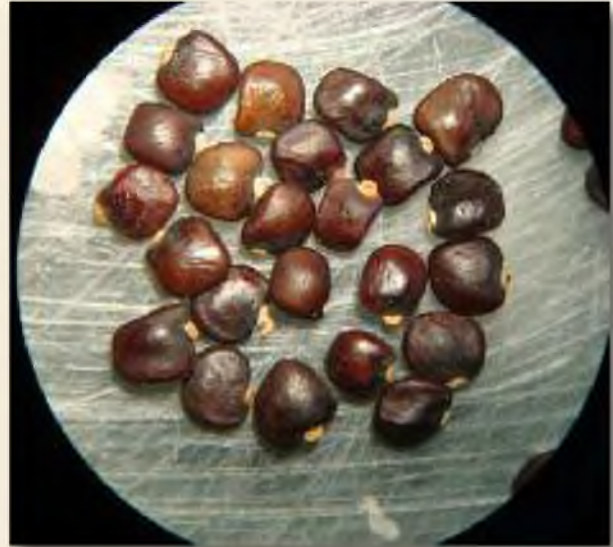


Mil mil





Pikil



Lupinu



Puka malva



Chachakuma

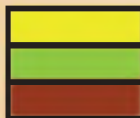




IMA KILLA SISAN, MUYUTA KUN, TANTAY RURANAPAK RIKUCHIKUNCHIKLLA HATUN YURAKUNAMANTA PACHA

| Yurakuna | Kulla | Panchi | Pawkar | Ayriwa | Aymuray | Raymi | Sitwa | Karwa | Kuski | Wayru | Sasi | Kapak |
|------------|--------|--------|--------|--------|---------|-------|-------|-------|-------|-------|-------|-------|
| Yawal | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Tilu | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Kishwar | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Kulla | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Llin llin | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Pikil | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Puka malva | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Lupinu | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |
| Chachakuma | Yellow | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green | Green |

Sisakuna
Kaspikuna tantana
Muyu tantana



*Chimborazo llaktapi
llin –llin muyu tiyak*





MAY UCHILLA WAYKUPI HATUN UCHILLA YURAKUNAMANTA ALLI MUYUKUNATA TANTACHISHKA

| Mayllapi muyukuna tiyashka | | | Alli muyuta rikuna wasipi ñawerishka | | | | | Alli muyukunata rikushka | | |
|----------------------------|----------------------|---|--------------------------------------|-----------|-----------------|---------------------|--------------------|--------------------------|---------|-----------|
| | | | Alli muyukuna | | | Ashalla shutushka % | Yupaypak muyu 100g | Kallari wiñay # punlla | wiñay % | Miyuchi % |
| Altitud | Llakta | Chikan, chikan yurakuna | Chuya % | Miyuchi % | Wañushka muyu % | | | | | |
| 3 280 | Pisicaz | Lupinu <i>Genista monspessulana</i> | 92.10 | 7.00 | 0.90 | 10.50 | 14 815 | 8 | 35 | 10 |
| 3 330 | UCASAJ | Kulla <i>Buddleja coriácea</i> | 8.10 | 91.90 | 0.00 | 9.20 | 185 185 | 8* | 10 | 30 |
| | | Chachakuma <i>Escallonia myrtilloides</i> | 57.00 | 0.00 | 43.00 | 12.50 | 8 850 000 | 6** | 53 | 15 |
| 3 350 | Santa Martha | Puka malva <i>Lavatera assugentiflora</i> | 41.10 | 2.70 | 56.20 | 14.00 | 3 326 | 14 | 26-22 | — |
| | | Lupinu <i>Genista monspessulana</i> | 69.20 | 30.80 | 0.00 | 10.10 | 16 340 | 6 | 15 | 70 |
| 3 470 | Chimborazo | Mil mil <i>Senna multiglandulosa</i> | 42.50 | 9.70 | 47.80 | 9.20 | 2 694 | 6 | 7 | 70 |
| | | Llin llin <i>Senna sp.</i> | 80.00 | 17.80 | 2.20 | 13.20 | 1 215 | 8 | 23 | 100 |
| 3 560 | Cuartel de los Incas | Pikil <i>Gynoxis</i> | 48.30 | 22.00 | 29.70 | 13.20 | 185 185 | 25 | 0,1 | 2 |
| 3 280 | Shobolpamba | Kishwar <i>Buddleja incana</i> | 88.00 | 0.00 | 12.00 | 6.80 | 530 000 | 6 | 13 | 0 |

* Kulla sisay kallari pachapi tantashka ** Sisa tukuri pachapi tantashka

Fuente: Programa Nacional de Forestería 2010. Valores expresados en base seca.





UCHILLA HATUN YURAKUNAWAN, MURUKUNAWAN TANTACHISHPA RURAYKUNATA PAKTACHI



Yaya Silverio Ati, Chimborazo llaktapi iskun watakunatami yawal, tilu, kishwar, lupinu, malva shinallatak retama yura ukukunapi chikan, chikan tarpuykunata paktachishpa shamun, patsak kanchis chunka yurakunatami shuk patsak tatki pampapi churashka, kay yurakunaka allimantami pata patayayta rurashpa shamun, shinallatak kay yurakunamantaka wiwakunaman kiwashinata karanmi.

Tantachishka yura
ukukunapika alli
murukunatami
charinchik:



UCASAJ-INIAP yurakunata kiwawanpash tantachishka rurashka llika yachaykunata taripankapak rikuchinapakpash rurashka, shinapash karu karumi yurakunaka churashka yawal, kishwar y kulla chusku patzak yurakunatami churashka, yurakunapuraka 5x5m. Shinallatak alli kiwatami tarpushka ñuñu shitak wakrakunata chaypimi michin.





Mashi Antonio Ati, Santa Marta ayllu llaktapi kawsan, pusak watakunatami tilu, lupinu, malva yurakunata charin, kay ukukunapika chikan, chikan tarpuykunata paktachishpami shamun, patsak kanchis chunka yurakunatami shuk patsak tatki pampapi churashka, shinaka chikan, chikan wiwakunapak wanukunawanmi tarpun. Tukuy murukunata, shinallatak kay yurakunamantaka wiwakunaman kiwashinata karanmi.



Mama María Lozano shinallatak yaya José Gualancañay, Shobol pamba ayllu llaktapi kawsak paypak allpa muyuntikkunapi kishwar, lupinu, retama, yawal, yurakunata churashka, kay yurakunaka iskun huatakunatami charin, shinapash shuk yuramanta kayshuk yurakamaka kimsa tatkitami charinkuna, shinapash chay yura ukukunapika chikan, chikan papa, haba shinallatak kiwatapash murukunatapash tarpushpami shamun.





ACHKA CARBONO SHINALLATAK BIOMASA WAKICHITA RIKUCHI KAY YURAKUNAPI

| SAF'S | Kuska (ha) | Chikan, chikan yurakuna | # árboles / SAF | Biomasa (kg / ha) | Carbono (tC / ha) |
|----------------------------------|------------|------------------------------|-----------------|-------------------|-------------------|
| Pata patayaypi yurakuna | 0,41 | yawal, tilu, kishwar, lupinu | 70 | 5518 | 3,1 |
| Ayllupak uchilla tarpuykuna | 0,03 | lupinu, tilu, yawal, kishwar | 56 | 35014 | 19,6 |
| Ayllupak uchilla tarpuykuna | 0,02 | tilu, lupinu, malva, yawal | 95 | 77296 | 43,2 |
| Kiwapi karupi churashka yurakuna | 0,38 | kishwar, kulla | 38 | 2861 | 1,6 |
| Ayllupak uchilla tarpuykuna | 1,33 | kishwar | 102 | 3073 | 1,7 |
| Kiwapi karupi churaska | 0,7 | yawal, kishwar, kulla | 280 | 12527 | 12,6 |

tC = toneladas de carbono

MASHNALLA BIOMASA SHINALLATAK CARBONO KAY YURAKUNA CHARISHKATA RIKUCHIK

| Especie | Biomasa (kg/árbol) | Fracción de carbono % |
|---------|--------------------|-----------------------|
| yawal | 44,9 | 55,1 |
| lupinu | 14,9 | 56,4 |
| tilu | 18,3 | 55,6 |
| kishwar | 35,8 | 54,9 |
| kulla | 31,0 | 55,6 |

Ñukanchik ayllu llaktapi tiyak yurakunaka achka carbono nishkata hapishpa wakichishkatami rikunchik achka, pichilla yurakuna kashpash.

Kay yurakunaka sumak achka yantatami kunkuna, kay ayllu llaktapi kawsakuna, ama shuktak yurakunata llakichichun.

Shinallatak wayra mapayashkata kay yurakunaka hapinmi, kipa punllata ama llakikunata charinkapak ashtawankarin chayshinalla kachunpash.





MAY UCHILLA WAYKUPI KAY YURAKUNAKA IMALLA PAKTACHIKUNATATAK RURAN.



Wasi ukuta
kunuchinapak,
mikunakunata
yanunkapakpash



Chikan, chikan ruraykunapak kaspi

Chikan, chikan
yurakunamanta tawka
ruraykunata
paktachinchik



Sisa, panka,
murukuna
ñawpa
pacha
hampikunata
ruranapak



Tullputa
llukshichishpa
churanata
mushukyachinapakpash





Muyuta tantana

Chikan, chikan yurakunata tarpukpika ayllukunapak kawsaytami allichinkuna.



Pichanata rurana yura



Chikan, chikan munanata rurana kaspikuna



Wiwakunapak
mikuna

Kay ayllu llaktapi kawsakunaka lupinu, tilu, y malva, yuramantami, kuy, llama, wakrakunaman kiwata shina karankuna, kay yurakunaka achka proteína cruda y energía metabolizable charinkuna, shinallatak mana kiwa tiyákpika yurakuna llullu kakpirak wiwakunaman karay tukunmi.



KAY YURAKUNATA CHIMPAPURACHI, LLAKTAPI TIYAK KIWAKUNAWAN

| Kiwashina | Chakirishka pankakuna % | Proteína % | Fibra % | Calcio % | Fósforo % | Energía metabolizable Mcal/kg |
|---------------------------|-------------------------|------------|---------|----------|-----------|-------------------------------|
| Lupinu | 27.42 | 18.63 | 23.80 | 0.79 | 0.22 | 2.71 |
| Malva | 22.28 | 28.72 | 17.53 | 2.24 | 0.42 | 2.41 |
| Tilu | 14.63 | 33.49 | 16.44 | 0.85 | 0.47 | 2.37 |
| Alfalfa | 21.90 | 22.20 | 24.00 | 1,16 | 0,36 | 2.67 |
| Pastura natural degradada | 31.00 | 11.20 | 24.50 | 0.52 | 0.18 | 2.05 |

Fuente: Programa Nacional de Forestería 2010. Valores expresados en base seca.





MAY UCHILLA WAYKUPI YURAKUNA IMALLA PAKTACHIKUNATA YANAPAN

Yurakuna imalla
paktachikunata rikuchin



Kasa murukunata ama
hapichun harkan



Wayku yakuta sumakta rikuchin



Wiwakunapak llanturina



Yurakunaka wayrata
harkak, llanturinapakpash



Sacha wiwakunapak kawsana wasi mirarinapakpash



Tzuktzuk



Hampatu



Puku



Urkukunata alli rikunata munanantapash rikuchin shinallatak carbono nishkatapash hapin

Sisakunamanta kayshuk sisawan murukuna tukuchun paktachin



Wawakuna pukllana



Yurakuna ñukanchik allpapi kipa punllata alli rikurichun nishpaka alli yurakunatami akillana kanchik.



KAY LLANKAYPI YANAPAKKUNA:

Venus Arévalo, Socioeconomía. Programa Nacional de Forestería – INIAP.
Franklín Sigcha, Programa Nacional de Forestería – INIAP.
Tobías Ati, Junta Parroquial San Juan.

KAY LLANKAITA APAK AYLLU LLAKTAKUNA:

Chinigua, Chorrera, Asociación Cordillera de los Andes, La Delicia, Pisicaz, Pulinguí San Pablo, Santa Isabel, Asociación Santa Martha, Shobol Llin Ilin, Shobolpamba.

AYLLU LLACTAPURA WANKURITA PUSHAK:

Unión de comunidades campesinas de San Juan (UCASAJ).
Federación de organizaciones campesinas indígenas de las faldas del Chimborazo (FOCIFCH).

YACHANA WASI YANAPAK:

Escuela Superior Politécnica de Chimborazo (ESPOCH),
Centro Bioforesta: Jenny Núñez.

Eco. Rafael Correa Delgado
MAMAPACHATA PUSHAK APU

Econ. Staynley Vera
MAGAP PUSHAK APU

Dr. Julio César Delgado Arce
INIAP PUNTA PUSHAK APU

Kay kuskapi tapuytukunki:

Programa Nacional de Forestería: karu uyari 022 690 692 (Quito)
Zirma Chaski: jorge.grijalva@iniap.gob.ec /
jose.riofrio@iniap.gob.ec



GOBIERNO NACIONAL DE
LA REPUBLICA DEL ECUADOR



ANO INTERNACIONAL
DE LOS BOSQUES • 2011