

## **Txoj Kev Tswj kom Cov Kab Ntxais Paj es Coj Hmoov Paj Ntawm Ib Lub Paj Mus Rau Ib Lub Paj (Insect Pollinator Best Management Practices) rau Lub Xeev Minnesota Qab Vag Tsib Taug thiab Cov Vaj Paj**

**Nov yog lub sij hawm yuav tau saib peb cov toj roob hauv pes kom txawv**

**Cov kab es coj hmoov paj ntawm ib lub paj mus rau ib lub paj mas muaj teeb meem, lawv muaj tsawg zuj zus lawm**

Ntau tshaj li ib feem peb ntawm tag nrho cov nroj tshuag los yog cov nroj tsuag es tib neeg noj yeej muaj feem xyuam nrog rau cov kab es coj hmoov paj ntawm ib lub paj mus rau ib lub paj. Ntau hom nroj tsuag xws li txiv laum huab xeeb almond, ev paum, txiv pos blueberry, paj hnub hlis, cov nplooj clover, cov paj siv los ua roj, muas yuav tsis rov qab tsim tau ntxiv yog tsis muaj cov kab coj cov hmoov ntawm ib lub paj mus rau ib lub. Muaj pov thawj ntau pom tias cov kab no ploj coob heev lawv. Cov muv los ploj thiab lwm cov kab los ploj qhov no yeej muaj feem xyuam nrog rau qhov tias lawv cov chaw nyob raug rhuav tag, muaj kab mob, muaj cov kab es ua rau lwm tus kab puas tsua, thiab tshuaj tua kab.

Qhov teeb meem ua rau cov kab coj hmoov paj ntawm ib lub Paj Mus Rau Ib Lub Paj mas muaj tsawg zuj zus: Cov toj roob hauv pes tsis muaj paj lawm, kev tswj los ntawm tib neeg, tsis muaj ntau hom qoob loo, muaj kab mob, muaj cab, muaj tshuaj tua nroj/kab.

**Zoo li yog ib qho teeb meem loj? Nws yeej yog!**

Qhov es cov kab coj hmoov paj ntawm ib lub paj mus rau ib lub paj mas muaj tsawg zuj zus muaj kev cuam tshuam tsis zoo rau peb. Tig kom tau qhov no kom rov qab muaj mas yog ib qho tseem ceeb rau peb cov nroj tsuag thiab tseem ceeb rau peb tib neeg kev noj qab hauv huv. Peb txhua tus yeej ua tau li qhob peb ua kom paub tau. Nrog rau ib qho kev xav ua ntej me me thiab muaj cov tswv yim npaj xwb, peb yeej pab tau cov kab coj hmoov paj no kom rov muaj ntau ntxiv los ntawm cov teeb meem es lawv tau ntsib.

Raws li lub tuam tsev saib xyuas kev ua liaj ua teb (United States Department of Agriculture), cov muv noj zib thiab muv qus (muv doom, muv leaf cutter, muv alkali, thiab muv mason) nqa hmoov paj ib lub mus rau ib lub ntau tshaj li \$15 billion cov qoob loo nyob hauv lub teb chaws Meskas ntawm ib xyoos twg. Yoov, kab beetle, npauj npaim, kab npauj, thiab nkawj los yeej yog lwm hom kab tseem ceeb es nqa hmoov paj thiab. Niaj hnub no peb tswj tau cov xub muv noj zibno tsawg tshaj li cov sij hawm 50 xyoo tas los no hauv lub teb chaws U.S.

# TSIM qhov chaw nyob tshiab! Pab kom cov kab nqa hmoov paj los rau nram koj lub vaj paj

Ib qhov chaw muaj nroj tsuag chaw zoo rau cov kab nqa hmoov paj yuav tsum yog qhov chaw es txhawb ntau hom kab es nqa hmoov paj es yog muaj ntau yam txiv hmab txiv ntoo thiab cov chaw rau lawv ua zes thiab ua zib ntawm thaum tu kom koj lub vaj paj zoo nkauj. Ntxiv mus rau qhov pab cov kab nqa hmoov

paj, cov txiaj ntsim es tsim kom muaj lub vaj paj rau ntau hom kab nyob kuj muaj xws li pab rau tib neeg kev noj qab haus huv, txo qhov av pob, pab kom cov dej haus kom huv, thiab pab kom cov av zoo ua qoob ua loo. Tsim thiab ceev qhov chaw nyob kom zoo rau ntau hom nroj tsuag muas yuav tsum yog muaj kev tswj zoo kom tiv thav tsis txhob pub lwm hom nroj tsuag tsis zoo loj hlob rau hauv qhov chaw ntawd. Nov yog ib co kauj ruam koj yeej ua tau hauv koj lub vaj paj kom tsim tau lub chaw nyob thab pab rau cov kab es nqa cov hmoov paj koj lawv txhob tu noob thiab kom huaj vam thiab ceev kom koj lub vaj paj zoo nkauj.

## Xaiv cov nroj tsuag kom cov kab ntxais paj nyiam heev

- Cog nroj tsuag es muaj ntau hom paj sib txawv muaj cov xim paj sib txawv thiab cov paj tawg kom nyias muaj nyias caij kom thiaj li muaj zib paj thiab hmoov paj tas mus li.

Lub rooj teev lus hauv qab no yog cov nroj tsuag tawg paj es kab ntxais paj nyiam thiab cov paj no yeej cog tau rau feem ntau ntawm cov vaj paj nyob hauv lub xeev Minnesota.

LUB CAIJ PAJ TAWG	QHOV CHAW PAB QHIA TXOG COV PAJ NOV	Source: University of Minnesota, Bee Lab
Peb Hlis – Tsib Hlis	Large beardtounge, Pussy willow, Wild geranium (cov nroj tsuag es muaj duab ntxoo), Hawthorn (ntoo)	
Peb Hlis – Xya Hli	Lanceleaf coreopsis, Virginia waterleaf, Wild lupine	
Rau Hlis – Xya Hli	Goatsbeard, Blue lobelia, Purple cone flower, Slender mountain mint	
Rau Hlis – Cuaj Hli	Alsike cover, Anise hyssop, Autumn joy sedum, Beebalm, Bicolor thistle, Borage, Catmint, Common boneset, Culver's root, Cup plant, Ironweed, Jewelweed, Joepye weed, Oregano, Partridge pea, Purple prairie clover, Rough blazing star, Sunflowers, Swamp milkweed, Yellow coneflower	
Yim Hlis – Cuaj Hli	Calico aster, New England aster, Stiff goldenrod	

- Thaum twg yog ua tau, xaiv cov nroj tsuag ib txwm nyob rau thaj chaw ntawd kom cov kab ntxais paj thiaj li nyiam los ntsauv.
- Xaiv cov nroj tsuag uas loj hlob zoo rau qhov chaw koj cog paj – hom av zoo li cas, cov teeb, qhov chaw cog paj kom sib nrug, lwm yam li cov no.
- Xav txog qhov uas xaiv cov nroj tsuag uas tseem tsis tau siv tshuaj tua kab txuag rau (lawv kuj yuav txuag tau mus rau cov hmoov paj thiab zib paj). Koom tes nrog cov chaw muag paj thiab cov chaw muag yub nroj tsuag kom paub tias hom nroj tsuag twg thiaj li muaj txiaj ntsim rau cov kab uas ntxais paj thiab nqa hmoov paj.
- Cog kom muaj ob peb kab kom sib kem kom muaj cov paj es cov kab ntxais paj nyiam thiab kom lawv thiaj li ya ntawm ib lub mus rau ib lub thiab kom cov chaw lawv nyob kom sib txuas ua ntu zus.
- Xaiv ib thaj chaw es tsis yog cov nroj tsuag tawg paj thiab yog tiaj nyom, ces cog cov paj ua tej koog kom muaj chaw rau lawv ua zes thiab nyob thaum lub caij ntuj no.
- Cog cov nroj tsuag tawg paj uas muaj ob daim nplooj paj (cov paj uas muaj ntau daim nplai paj, feem ntau muaj ib daim nplai paj, ces sab hauv los tseem muaj ib daim nplai paj thiab) ntau zaus lawv tsis muaj cov hmoov paj los yog cov zib paj. Lawv yuav tsum tsis yog tib co paj uas koj cog hauv koj lub vaj paj.
- Tsis txhob cog cov nroj tsuag uas hlaw es nam chaw (cov nroj tsuag na mas loj hlob ntxhov npoov mus rau lwm tsob paj uas ua rau lwm hom nroj tsuag tuag). Kawm kom paub ntau dua txog cov nroj tsuag uas nam chaw hauv lub xeev Minnesota mus saib hauv [www.mda.state.mn.us/weedcontrol](http://www.mda.state.mn.us/weedcontrol) thiab [www.dnr.state.mn.us/invasives/index.html](http://www.dnr.state.mn.us/invasives/index.html)

## Cov chaw es tsis muaj neeg mus phov yog cov chaw zoo rau cov kab ntxais zib paj no nyob thiab ua zes

- Tsis txhob mus phov ntawm cov chaw es muaj cov kab ntxais zib no twb yeej ntxais zib lawm xws li cov chaw lawv nyob ua zes.
- Thaum twg yog ua tau, txav ntawm thaj chaw nyob ze, ntawm ib sab, los yog ntawm koj lub vaj paj es tsis txhob phov ze.
- Tso cov cag ntoo qhuav uas vau lawm, cuam nplooj ntoo rau, cov kav paj, thiab cov chaw kom txhob muaj dabtsi nyob li kom thiaj li muaj chaw rau lawv nyob ua zes thiab nyob thaum lub caij ntuj no kom lawv thiaj li nqa hmoov paj tau ntawm ib lub mus rau ib lub. (saib hauv koj lub zos txog cov cai es siv cov ceg ntoo lwj)



Tus tswv ntawm cov duab: Heather Holm

## TXHIM KHO cov vaj paj ntawm qab vag tsib taug (landscapes) es twb yeej tsim muaj lawm! Cov nyom ntawm tog tsev yeej us kom lawv yog ib qho chaw zoo rau cov muv los

- Cia cov paj uas cov kab ntxais paj nyiam nyob twj ywm ntawm koj cov nyom xws li cov paj dandelions thiab clover thaum lub caij paj tawg thaum ntov kom thiaj li muaj hmoov paj thiab zib paj ntau. (Cov nroj no tej zaum kuj yog ib co nroj uas koj tsis nyiam los yog cov neeg nyob ze ntawm koj lub tsev tsis nyiam; tswj cov nroj tsuag uas koj tsis nyiam no kom zoo thaum muaj lwm yam paj uas muaj hmoov paj thiab zib paj kom cov kab ntxais tau paj. Kuj mus saib hauv koj lub zos cov cai es cia cov paj koj tsis nyiam no loj hlob ntawm koj cov nyom ntawm qab vag tsib taug.
- Kho qhov uas txiav nyom heev heev thiab saib cov sij hawm mam txiav kom pab tau cov kab ntxais paj.
- Yog tias koj muaj cov chaw uas tuaj tu koj cov nyom los yog xav tias yuav muaj ib qho chaw tuaj tu nyom, nrog lawv tham txog qhov uas koj xav kom tiv thaiv cov kab ntxais paj thiab tiv thaiv lawv lub chaw nyob.

### Kev xyaum tswj kom zoo yuav pab tau rau cov kab ntxais paj tej yam lawv ua

- Taw qhia kom paub thiab nkag siab txog tej yam kab es tsis zoo thiab cov kab es muaj txiaj ntsim. Kom paub tias cov kab no yog cov twg nyob hauv lub xeev Minnesota mus saib hauv [www.extension.umn.edu/garden/diagnose/insect/](http://www.extension.umn.edu/garden/diagnose/insect/)
- Lees txais ib co kab es ua puas tsuaj rau cov nroj tsuag.
- Thaum siv cov tshuaj tua kab, tshwj xeeb yog hom tshuaj tua cov kab insecticide, xaiv hom tshuaj tua kab es tsis txhob muaj kev phom sij rau cov muv thiab tseem ho tua tau lwm cov kab thiab. Siv cov tshuaj no tua thaum tsis muaj muv los ntsauv cov paj. Ua kom raws li cov kev cob qhia lo rau poom tshuaj. Daim ntawv lo no yog txoj cai. (Saib cov ntawv qhia nyob ntawm lub npov txog qhov tua tshuaj kom txo qhov kev phom sij rau cov kab ntxais paj thiab kom paub siv cov tshuaj raws li daim ntawv qhia.)
- Siv lub tswv yim hu ua Integrated Pest Management (IPM) rau hauv koj lub vaj paj. IPM siv cov ntaub ntawv qhia koj cov kab uas tsis zoo kom thiaj li tswj tau qhov puas tsuaj los ntawm cov kab no koj thiaj li tsis muaj kev phoj sij ntau rau tib neeg, cov chaw, thiab cov nroj tsuag. Xav kom paub ntau dua txog IPM ntawm koj lub vaj paj thiab cov tsev mus saib hauv: <https://store.extension.iastate.edu/Product/RG201.pdf>

### Tsim ib qhov kev sib koom tes thiab xa lus kom thoob plaws

- Qhia rau cov neeg nyob ib puag ncig ntawm koj tias vim li cas thiaj li tsim kom muaj lub vaj paj zoo rau cov kab ntxais paj, thiab txhaub kom lawv los koom nrog.
- Tiv paib qhia rau lwm tus txog qhov koj xav tiv thaiv cov kab ntxais paj.
- Qhov koj zaj dabneeg thiab cov duab nrog rau cov neeg nyob hauv koj lub zos.
- Tsim qhov kev koom tes nrog lwm lub koos haum uas txhawb tau kom cov kab ntxais paj no muaj chaw nyob, piv txwv, muaj cov chaw rau tib neeg mus ua si, muaj chaw ntaus golf, roob toj ntxas, tsev kawm ntawv, etc.

Xav kom paub ntau dua txog tswj cov kab ntxais paj qhov chaw nyob ntawm cov av rau pej xeeb mus ua si thiab cov chaw ua si mus saib hauv [www.dnr.state.mn.us/index.html](http://www.dnr.state.mn.us/index.html) thiab cov chaw ntaus golf mus saib hauv [www.pollinator.org/PDFs/Making\\_Room\\_for\\_Native\\_Pollinators\\_pdf.pdf](http://www.pollinator.org/PDFs/Making_Room_for_Native_Pollinators_pdf.pdf)



## Paub qhov sib txawv ntawm tus muv thiab tus ntseeb

Ntseeb mas yog hom kab muaj nuj nqis es lawv noj cov kab uas tsim kev phom sij thiab lawv kuj nqa tau hmoov paj mus rau lwm lub paj thiab. Ntseeb zoo ib yam li muv thiab lawv kuj sib txheeb thiab (nkawd ob leeg yog tsev neeg ntawm cov kab hu ua Hymenoptera). Tib neeg feem ntau saib yuam kev ntawm tus ntseeb daj tias yog tus muv noj zib vim tias nkawd ob leeg yeej plev tib yam nkaus. Ob pawg kab nov feem ntau mas tsis tsiv rau tig neeg tshwj tsis yog tias yuav muaj kev phom sij rau lawv los yog phom sij rau lawv lub chaw nyob/xub muv. Cov ntseeb dajmas tsivheev thaum lub caij ntuj sov yuav luag tas thiab thaum caij nplooj ntoos hlav thaum lawv nrhiav tib neeg tej khoom noj, es qhov no mas yuav ua rau muaj kev plev neeg heev.

Qhov yooj yim kom paub qhov sib txawv ntawm tus ntseeb daj thiab tus muv noj zib ces yog lawv cov plaub. Cov muv mas muaj plaub ntawm lawv lub cev hos cov ntseeb daj muaj qee txoj plaub ntawm lawv lub cev. Ntxiv mus, cov xim ntawm tus ntseeb dajmas nyob kiag ntawm nws lub cev, hos cov muv mas cov xim zoo tib yam ntawm lub cev thiab cov plaub. Cov ntseeb daj mas lawv me zog cov muv doom thiab loj tib yam li tus muv noj zib. Cov ntseeb daj mas lub dua nqia nqia, me me, thiab tsuas nqa hmoov pag tsawg tsawg los yog twb tsis nqa li. Xav kom paub ntau dua txog cov muv, ntseeb, thiab muv hornet, mus saib hauv [www.extension.umn.edu/garden/insects/find/wasp-and-bee-control/](http://www.extension.umn.edu/garden/insects/find/wasp-and-bee-control/)



MUV NOJ ZIB



Tus tswv ntawm cov duab:  
Photo Credit:  
Jeff Berg

MUV DOOM



Tus tswv ntawm cov duab: Scott King

NTSEEB DAJ



Tus tswv ntawm cov duab: Scott King

NTSEEB NTAWV



Tus tswv ntawm cov duab: Scott King

NTSEEB POTTER

## Lub luag hauj lwm thaum muaj muv coob coob

Thaum muaj muv coob coob yog ib lub tswv yim ntawm cov muv es lawv ua menuyam. Tus niam muv huab tais thiab npaum li ib nrab ntawm cov muv es yog cov ua hauj lwm tawm ntawm lawv xub muv thiab mus nrhiav lub chaw nyob tshiab, feem ntau yog thaum lub caij nplooj ntoos hlav los yog lwm lub caij nyoog es cov huab cua nyob ntawm ib puag ncig zoo rau lawv txav chaw. Thaum pom cov muv ya coob coob mas yog ib qho es txaus ntshai heev, tabsis yog tias tsis muaj neeg thab cov muv ces lawv tus xeeb ceem yeej tsis yog tus uas tsiv heev rau tib neeg. Yog tias pom muv ya coob coob ua ib pab yam tsis yog tsim kom muaj ib xub muv los yog tsis tsaws rau ib tso ntoo los yog cov nroj tsuag txiv duav, koj tsis tas ua dabtsi li. Yog tias qhov chaw uas lawv ya coob coob ua ib pab nyob zee rau cov chaw tib neeg taug kev heev, nrhiav kev pab los ntawm cov neeg tu muv. Nrhiav cov neeg kom tshem tau thaum muaj cov muv coob coob ces tiv tauj tau rau lub chaw Minnesota Hobby Beekeepers Association at: [www.mnbeekeepers.com](http://www.mnbeekeepers.com)





## Cov Vas Sab

- University of Minnesota Bee Lab: [www.beelab.umn.edu](http://www.beelab.umn.edu)
- Plants for Pollinators: <http://cues.cfans.umn.edu/old/pollinators/plants.html>
- Gardening for Pollinators: [www.fs.fed.us/wildflowers/pollinators/gardening.shtml](http://www.fs.fed.us/wildflowers/pollinators/gardening.shtml)
- Center for Urban Ecology and Sustainability: [www.entomology.umn.edu/cues/](http://www.entomology.umn.edu/cues/)
- Natural Resource Conservation Service: [www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/plantsanimals/pollinate/)
- Xerces Society for Invertebrate Conservation: [www.xerces.org/pollinator-conservation/](http://www.xerces.org/pollinator-conservation/)
- Pollinator Partnership Gardening Resources: [www.pollinator.org/gardens.htm](http://www.pollinator.org/gardens.htm)
- Pollinators & Pollination: [www.msue.anr.msu.edu/topic/info/pollinators\\_and\\_pollination](http://www.msue.anr.msu.edu/topic/info/pollinators_and_pollination)

## Apps

- BeeSmart Pollinator Gardener: [www.pollinator.org/beesmartapp.htm](http://www.pollinator.org/beesmartapp.htm)
- Pollination 2 Plate: For planning an array of public pollinator gardens around your region. [www.bumbleboosters.unl.edu/?q=p2p](http://www.bumbleboosters.unl.edu/?q=p2p)
- Waitrose: A game about pollination from the University of Nebraska-good learning tool for all ages. [www.waitrose.com/bees#.U159H1PuMmg](http://www.waitrose.com/bees#.U159H1PuMmg)

## Cov ntawv sau txog thiab tej phau ntawv

- Living Landscapes of Minnesota: [www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_022410.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_022410.pdf)
- Plants for Minnesota Bees: [www.extension.umn.edu/garden/master-gardener/volunteers/continuing-education/help-rusty-patched-bee/plants-mn-bees.pdf](http://www.extension.umn.edu/garden/master-gardener/volunteers/continuing-education/help-rusty-patched-bee/plants-mn-bees.pdf)
- Pollinator Conservation: <http://www.extension.umn.edu/garden/plant-nursery-health/docs/2014-Krischik-pollinator-conservation.pdf>
- Making room for native pollinators, how to create habitat for pollinator insects on golf courses: [www.pollinator.org/PDFs/Making\\_Room\\_for\\_Native\\_Pollinators\\_pdf.pdf](http://www.pollinator.org/PDFs/Making_Room_for_Native_Pollinators_pdf.pdf)
- Bees, Wasps and Hornets What You Need to Know: [www.gov.mb.ca/housing/pubs/pests/bees.pdf](http://www.gov.mb.ca/housing/pubs/pests/bees.pdf)
- Removing Honey Bee Swarms and Established Hives: [www.ipm.ucdavis.edu/PDF/PESTNOTES/pnhoneybeeswarm.pdf](http://www.ipm.ucdavis.edu/PDF/PESTNOTES/pnhoneybeeswarm.pdf)
- Protecting Honey Bees From Pesticides: <http://pollinatorstewardship.org/wp-content/uploads/2014/02/Protecting-Honey-Bees-Florida.pdf>
- Pollinators of Native Plants by Heather Holm; Pollination Press LLC, 2014. ISBN-13: 978-0991356300.
- Tiny Game Hunting: Environmentally Healthy Ways to Trap and Kill the Pests in Your House and Garden by Hilary Dole Klein, Adrian Wenner and Courtlandt Johnson; University of California Press, 2001. ISBN-13: 978-0520221079.

Tag nrhov cov URL twb yeej nkag tau thaum lub Raus Hlis 19, 2017.

Lub tuam tsev saib xyuas kev ua liaj ua teb Minnesota Department of Agriculture koom tes nrog cov neeg hauv qab no kom npaj tau cov tswv yim zoo kom tswj tau:

- Bachman's • Edina Local Food Task Force • Hennepin County Environmental Services • League of Minnesota Cities • Minneapolis Park and Recreation Board • Minnesota Association of County Agricultural Inspectors
- Minnesota Division Izaak Walton League of America • Minnesota Golf Course Superintendents Association • Minnesota Hobby Beekeeper • Northern Gardener Minnesota State Horticultural Society • Rice County Soil and Water Conservation District • The Beez Kneez • University of Minnesota, Department of Entomology • University of Minnesota, Department of Fisheries and Wildlife • University of Minnesota Extension • United States Golf Association.

Raws li tsab cai ntawm cov neeg xiaiv oos qhab Americans with Disabilities Act, cov ntaub ntawv no yeej muaj rau lwm hom kom lwm tus nyeem tau yog tias xav tau es tiv tauj mus rau 651-201-6000. Cov neeg siv TTY yeej hu tau rau the Minnesota Relay Service ntawm 711. Lub chaw MDA yeej muaj vaj huam sib luag txog kev kawm thiab kev ua hauj lwm.

# TXO qhov tsis zoo thaum siv tshuaj tua cov kab ntxais paj

- Tsua siv tshuaj tua cov kab tsis zoo thaum yuav tsum tau siv nkaus xwb.
- Thaum twg ua tau, xaiv cov tshuaj tua kab, tshwj xeeb yog siv cov tshuaj tua kab hu ua insecticides, kom tsis muaj tshuaj tsis ntau rau cov muv (saib daim ntawv qhia hauv qab).
- Saib daim ntawv me me ntawm lub npov es lo qhia kom tiv thaiv rau cov kab hu ua insecticides thiab yuav tsum ua raws nraim li daim ntawv lo qhia. Daim ntawv lo qhia no mas yog txoj cai. Kom paub ntau dua txog daim ntawv lo qhia tiv thaiv cov muv es yog sau ua rau lwm hom lus mus saib hauv [www.epa.gov/pesticides/ecosystem/pollinator/bee-label-info-lrt.pdf](http://www.epa.gov/pesticides/ecosystem/pollinator/bee-label-info-lrt.pdf)
- Xav txog qhov uas tsuag tshuaj rau tej thaj xwb es tsis txhob txuag tshuag kom thoob plaws.
- Txuag tshuaj thaum cov muv tsis ya tawm mus nrhiav noj (thaum ntxov los yog thaum yuav tsaus ntuj, los yog thaum huab cua kub qis tshaj 55° F).
- Communicate with local beekeepers before applying pesticides and prevent drift when applying pesticides.

Cov tshuaj tua kab insecticides muaj rau cov pej xeem hauv lub xeev Minnesota siv thaum tuaj tshuaj rau cov nroj tawg paj thiab saum npoo av.

COV CHAW	CHAV KAWM TUA TSHUAJ INSECTICIDE	COV KHOOM SIB TOV (ACTIVE INGREDIENT)	MUAJ TSHUAJ LOM MUV	FEEM NTAU SIV LI CAS
Cov paj tawg zoo zoo nkaui (Nroj tsuag tawg paj thiab npoo av)	Carbamate	Carbaryl	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws mentsis xwb
	Neonicotinoid	Clothianidin	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws
		Imidacloprid	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws
		Thiamethoxam	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws
	Oxadiazine	Indoxacarb	Muaj tshuaj lom ntau heev	Chwv
	Pyrethroid	Beta-cyfluthrin	Muaj tshuaj lom ntau heev	Chwv
		Bifenthrin	Muaj tshuaj lom ntau heev	Chwv
Anthranilic diamide	Cyantraniliprole	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws	
Cov paj tawg zoo zoo nkaui nkaus xwb	Bacterium	Bacillus thuringiensis	Muaj tshuaj tsawg tsawg	Noj
	Benzoylacetone	Cyflumetofen	Muaj tshuaj tsawg tsawg	Chwv
	Botanical	Azadirachtin	Muaj tshuaj tsis ntau tsis tsawg	Siv tua kom thoob plaws
	Carbazate	Bifenazate	Muaj tshuaj tsis ntau tsis tsawg	Chwv
	Inorganic	Cryolite	Muaj tshuaj tsawg tsawg	Chwv
		Kaolin clay	Muaj tshuaj tsawg tsawg	Chwv
	Spinosyns	Spinosad	Muaj tshuaj lom ntau heev	Chwv
	Neonicotinoid	Acetamiprid	Muaj tshuaj tsis ntau tsis tsawg	Siv tua kom thoob plaws
		Dinotefuran	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws
	Butenolide	Flupyradifurone	*Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws
		Oils	Canola oil	Muaj tshuaj tsawg tsawg
			Garlic oil	Muaj tshuaj tsawg tsawg
		Mineral oil	Muaj tshuaj tsawg tsawg	Chwv
		Neem oil	Muaj tshuaj tsawg tsawg	Siv tua kom thoob plaws
		Soybean oil	Muaj tshuaj tsawg tsawg	Chwv
	Organophosphate	Acephate	Muaj tshuaj lom ntau heev	Siv tua kom thoob plaws
		Malathion	Muaj tshuaj lom ntau heev	Chwv
	Pyrethroid	Cyfluthrin	Muaj tshuaj lom ntau heev	Chwv
		Lambda cyhalothrin	Muaj tshuaj lom ntau heev	Chwv
		Permethrin	Muaj tshuaj lom ntau heev	Chwv
		**Tau fluvalinate	Muaj tshuaj lom ntau heev	Chwv
		Zeta cypermethrin	Muaj tshuaj lom ntau heev	Chwv
		Fenazaquin	Muaj tshuaj lom ntau heev	Chwv
Npoo av nkaus xwb	Anthranilic diamide	Chlorantraniliprole	Muaj tshuaj tsawg tsawg	Chwv
	Insect growth regulator	Halofenozide	Muaj tshuaj tsawg tsawg	Siv tua kom thoob plaws
	Organophosphate	Trichlorfon	Muaj tshuaj tsawg tsawg	Chwv
	Pyrethroid	Gamma cyhalothrin	Muaj tshuaj lom ntau heev	Chwv

\*Raws li qhov muaj tshuaj ntau thiab tsawg tsam nqo tau. Nws kuj muaj cov tshuaj tsawg heev thaum chwv tau.  
 \*\*Muag es muab tov nrog rau lwm cov tshuaj es yeej npaj siv lawm tabsis tsis yog cia li siv tau hom tshuaj no ntawm nws tau khee yam tsis muab sib tov.

Cov tshuaj tua cov kab no yog cov tshuaj yeej npaj siv tau lawm thiab tsis yog lub npe rau cov tshuaj no. Cov npe teeb no kuj tsis muaj tag nrho; yuav tsum tau saib daim ntawv lo me me tas muab li. Muaj cov ntau ntawv qhia ntxiv rau cov tshuaj los yog lwm cov tshuaj yeej nrhiav tau ntawm <http://state.ceris.purdue.edu/>. Qhov muab teeb tias cov tshuaj no muaj taug heev thiab tsawg npaum cas yog muab los ntawm LD50 los ntawm lub chaw US Environmental Protection Agency. LD50 yog cov tshuaj es muaj taug kom taug heev npaum thaum siv ib zaub twg (Lethal Dose) es qhov tua kom taug no siab npaum li 50% thaum muab cov tshuaj cov los sim. Qhov cov tshuaj muaj taug ntau: LD50 <2 µg ai/bee; Qhov cov tshuaj muaj tsis ntau tsis tsawg: LD50 2-11 µg ai/bee; Qhov cov tshuaj muaj tsis ntau: LD50 >11 µg ai/bee. Xav paub ntau dua mus saib hauv [www.epa.gov/pesticide-science-and-assessing-pesticide-risks/technical-overview-ecological-risk-assessment-0](http://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/technical-overview-ecological-risk-assessment-0)

## Qhov chaw qhia tiv thaiv cov kab ntxais paj nyob rau tej co ntawv lo rau lub npov me me ntawm cov tshuaj tua kab

**XUB XUB NYEEM DAIM NTAWV LO ME ME**

**TIV THAIV COV KAB NTXAIS PAJ TXWV QHOV TUA COV TSHUAJ NO YEEJ MUAJ RAU COV TSHUAJ NO VIM YOG MUAJ KEV PHOM SIJ RAU COV MUV THIAB LWM COV KAB ES NTXAIS PAJ. UA RAW S LI COV KEV TXWV QHOV TUA COV TSHUAJ NO YEEJ NRHIAV TAU NYOB RAU NTAWM QHOV SOB LUS COB QHIA SIV COV TSHUAJ KOM TIV THAIV TAU COV KAB NTXAIS PAJ.**

Nrhiav daim duab kom pom tus muv (bee hazard icon) nyob rau sob lus Cob Qhia rau Siv thaum tua cov tshuaj rau thaj chaw twg es txwv qhov siv thiab cov qhia kom tiv thaiv tau cov muv thiab lwm cov kab es ntxais paj. **Cov tshuaj tua kab no yeej tua tau cov muv thiab lwm cov kab es nyiam ntxais paj.**