

ADDAWLAT AN NIJER

Edag an talalt ta n tamawen

JICA

Minitar wa yiwalan Cugas

MDA

Annizam an tatat an gorasan wan sahel
EDOS

**AMMALAL N ASALMAD I MAGYAKAN DAG CIGARWEN N
AMATTAL AN MAGLAN AN CUGAS**



D ASAMMAGNI N AZANZI N ARATAN WAN CUGAS



Abril 2008

**Edag an tadhil wa n tama
(J-Green)**

**Yakna, dag tarrayt an taraddaw ad EDOS
As Gie « arrabax n aggaz fel tamert ta n 21 – ECO 21
Ad talalt an froje wan maglan an cugas /FAO :**

Wan taganin:

Badamassi DJARIRI, ECO 21 ;

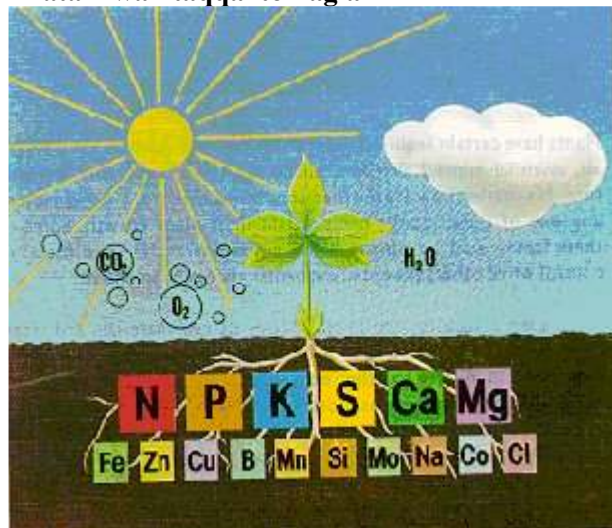
Efficacité-Efficacité-Efficacité : devise du G.I.E 21

voire partenaire pour un nouveau regard dans le 21^{ème} siècle pour un développement durable

I Asacco an makrazan ad tanfa n madlan

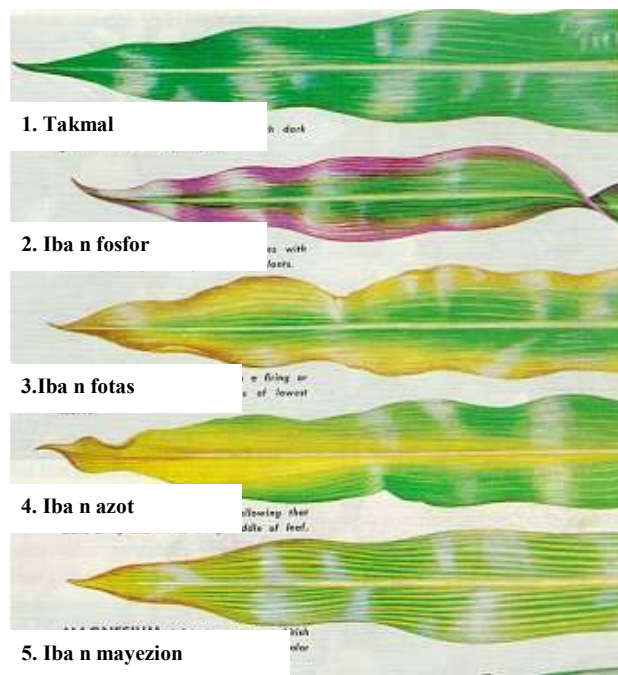
1.1. Aratan wan taqqal tomagla sudirnin

Aratan wan taqqal tomagla



Dag sagis (6) aratan wan yaqqal almuxsul, N,P,K,S,Ca,MG,almakraz yazumuzil N, P ad K s igati. Egas aratan wini sagis (6) yaqqaltan almuxsul fel almakraz azzar afragan ad aqqal, igannatan tizona dag wa yaknan as tamaqqost n azzaman

Sannalan iba n aratan



1.2. N, P ad K : Assagalan :

N : Azot

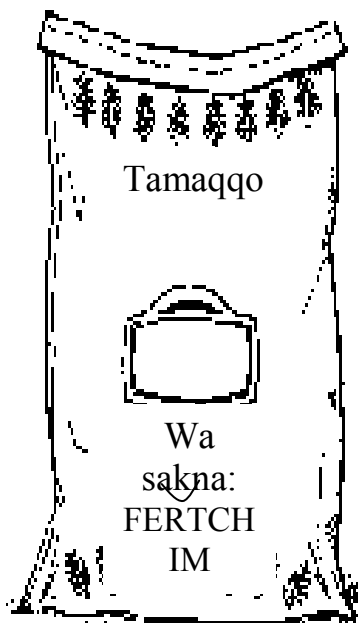
1. Yataffu tazzawzzawt
2. Yataffu taflawan hôsaynin

P : fosfor

1. Yasadwal ikewan
2. Yasamagnat gassud d asammagni

K : fotasiom

1. Yataffu taggazt dâg almakraz
2. Yataballan ad manna
3. Yasaaxat ammagnun n arawàn



N : Azot

1. Yanakk ay tarmad dâg amaḍal
2. Yatawaggu s igaci
3. Yataggaz tarmad

P : fosfor

1. War anakkaw dâg amaḍal azzar yataggar wallen.
2. Yatawaggu gur affar.
3. Batu dâg Nijer

K : fotasiom

1. War talla s igaci dâg Nijer
2. Yatawaggu gur affar

1.3. Aggad an aratàn,tanfan dalgadaran an mudaran.

Talalen aggôtnin n aratàn n almaxsud ad aqqalan i almakraz tanfa azzar aqqalan-as tattat ad tadawla.

Aggad n azot ad fosfor afragan ad asmadasan aman n amadal medàg wan cisaqqeñ às tese n agalak ad harwan.

1.4 . A wa sikna d almignatan n ekinnin cimaqqast n azzaman.

Allan-tu assin almignatan n akannin n cimaqqast n azzaman

- Almigna n azzaman fel ekannin cimaqqast azzaman aggôtnin,
- Almigna n akanni fel ekannin n cimaqqast artaynin.

Tamaqqost ta, N-P-K tafrag ad taknu s asnat tarrayen:

Tartayt an tamaqqost :

Tartayt in tamaqqost tattag dàg karad daggàn



Tamaqqost in N



Tamaqqost in P



Tamaqqost in K

Azzar yassartay cimaqqast.



Allan-tu karad rawan in rawan war nola.

Iyyàn wan N,
Iyyàn wan P,
Iyyàn wan K.

Iragisan akkar fel cizanen.

Egaz aràt way yataffu arwa tarrayen killu tin atawaranin.

Ekinni n azzaman

Tamaqqost tiknat dàg edag iyyan.



Masìn taknu tamaqqost s ak ekab yahe N,P ad K

Dàg anki ekab iyyàn da ad tillan.

Almisalan in cimaqqast artaynin in Nijeriya fel daggan in Nijer



Almisal in cimiqqast aggotnin in Nijeriya fel edag in Nijer.

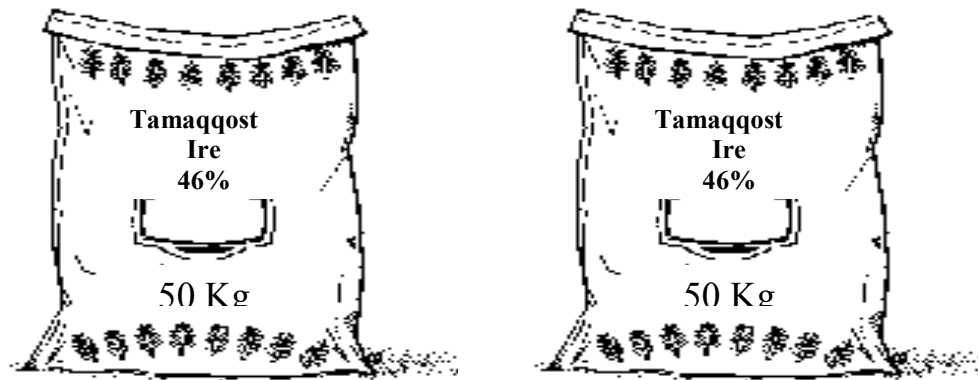


1.5 . Tinfa n issikitan in N,P meda ad K iwarnin bihutan in tamaqqost.

Assikit yasaknu igt in N,P meda K wa yahan 100Kg, dæg inki wa yahan issin buhutan win 50Kg

a) Almisal n ire(tamaqqost).

Ifrag ad iktab fel buhu : ire **46-0-0**



Sammosat timirwen kilow d ikkoz.(54) win daggawarnin aràt wir taha tinfa willa. Aràt wa itwalas safan dæg awa tinazzu tamaqqost, awa inazzu buhu d afris aràt wà taha tinfa. Awa inazzu buhu gas wir inna wala.

b) Almisal in DAP.

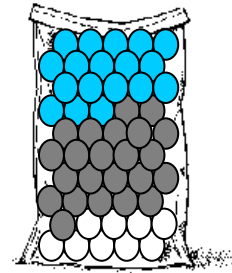
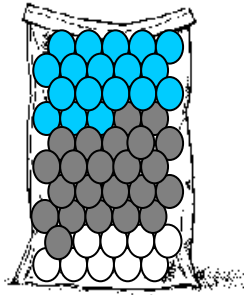
Afris isaknu igt in N,P meda K wa yahan 100Kg, dæg inki dæg issin buhutan in 50Kg.

Felbuhutan in dap, iktab fell-asàn : **18-46-0**

dàg 100 kg in tamaqqost DAP, dàg inki ahantan :

- 18 kg n Azot : N
- 46 kg in fosfor : P
- 0 kg in fotas : K
- 36 kg n aràt wa yammen.

Dàg ak buhu in 50 kg ahan-tu:



$$\begin{array}{l}
 9 \text{ kg in N (Azot) : } \text{○} \\
 23 \text{ kg in P (fosfor) : } \text{●} \\
 18 \text{ kg n aràt wa yammen : } \text{○}
 \end{array}
 +
 \begin{array}{l}
 9 \text{ kg in N (Azot) : } \text{○} \\
 23 \text{ kg in P (fosfor) : } \text{●} \\
 18 \text{ kg n aràt wa yammen : } \text{○}
 \end{array}
 = 18-46-0$$

c) Almisal in 15-15-15.

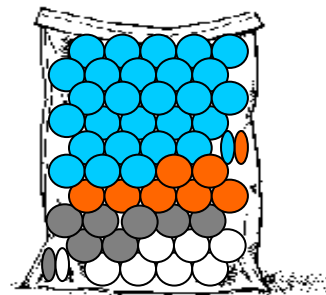
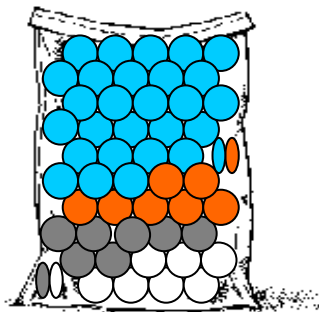
Afris isakni igit in N,P meda K wa yahan 100Kg, dàg inki issin (2) buhutan in simmosat timirwen in kilaw (50 kg.)

Fel buhutan iktab : **15-15-15**

Dàg100 kg in tamaqqost yahan dàg inki :

- 15 kg n Azot : N
- 15 kg in fosfor : P
- 15 kg in fotas : K
- 55 kg . n aràt wa yammen

Dàg ak buhu wan 50 kg ahan-tu :

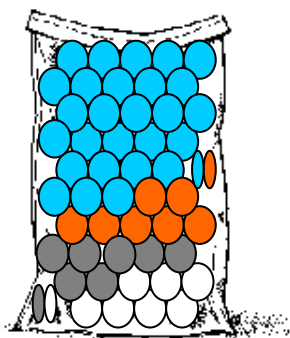


$$\begin{array}{l}
 7,5 \text{ kg in N (Azot) : } \text{○} \\
 7,5 \text{ kg in P (fosfor) : } \text{●} \\
 7,5 \text{ kg in K (fotas) : } \text{●} \\
 27,5 \text{ kg: n aràt wa yammen } \text{○}
 \end{array}
 +
 \begin{array}{l}
 7,5 \text{ kg in N (Azot) : } \text{○} \\
 7,5 \text{ kg in P (fosfor) : } \text{●} \\
 7,5 \text{ kg in K (fotas) : } \text{●} \\
 27,5 \text{ kg n aràt wa yammen } \text{○}
 \end{array}
 = 15-15-15$$

d) Innikudan in cikra fel immignu n cimaqqast

immos iktab fel buhutan 15-15-15

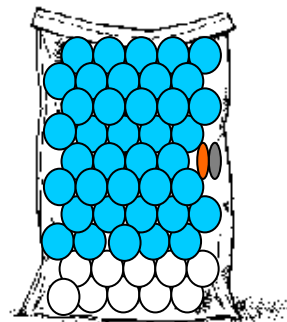
Yahor-as ad igriw **15-15-15**



Dàg buhu wan (50kg) in 15-15-15, ahan-tu :

7,5 kg in N (Azot) : ○
7,5 kg in P (fosfor) : ●
7,5 kg de K (fotas) : ●
27,5 kg : n aràt wa yammen ●

Wir ge in 20-1-1, s ilmigna n akkar fel ekinni



Dàg buhu wan (50kg) in 20-1-1, ahan-tu :

10 kg in N (Azot) : ○
0,5 kg in P (fosfor) : ●
0,5 kg in K (fotas) : ●
39 kg : n aràt wa yammen ●

Immos buhu tahe tamaqqost in 20-1-1, nisankaw issin fel iyyàn in aràtan win taha tinfa fel tamaqqost ta timmignet 15-15-15, isankaw dàg inki 50 timirwen fel tamede (50 %) n azrif-net. Wa din izanzin inta amgar n aràt wa din izanzu.

1.6 . Almignatan n igi n cimaqqast

a) Eziwwiziwiz s ifus

Takarse ta rigisat inta ta n eziwwiziwiz in tamaqqost s ifus (igi n àdag n amadal),alwaq iyyàn s ifus.

b) Eziwwiziwizan daggan tiwafranin

Tikrsawen aggotnin taffinàt tamaqqost ad tiggiz edàg wa yaha almikraz,fel almikraz ad igu sir-is tinfa tirmad:

- Agizu wa titaggaz tamaqqost, isafsasan igi inimalkaman in rawan inten awa itwaran dàg tamaqqost



Agizu wa titaggaz tamaqqost



- Tamaqqost ta tahàt ebawel tamos takarse titiwaràt fel ilmikrazan win tamert n ijinna . Igi n dàg àdag wa innifranan in tamaqqost « n àbawel » s ilmigna n ifus yamos takarse tisamartayat tamaqqost d irawan dàg ebawel.



Itiwara ad taddagdag tamaqqost dàt akaraz



Alwaq wa n karazan, ad nugu tamaqqost ta tiddigdagat dæg buwlan diffir as niga ikabban. Fel 15-15-15 ad nugu 6 g dæg ak ebawel, meda issikit itiwassanat, a itafin 60 kg in tamaqqost ak ektar.

Fel DAP, ad nugu 2g dæg ak ebawel, dæg inki 20Kg in tamaqqost ak ektar.



Igi n issigil wan ebawel ifrag ad agu is takarse s issin issikat dæg alwaq n akaraz: issikat iyyàn(1) wan rawàn d iyyàn wan tamaqqost.



Immikan n igi n tamaqqost

Edag n agamay	Tamaqqost/ektar	Iqqal/CFA/Ha
PEN/INRAN	50 Kg TSP + 50 Kg Ire, s eziwwiziwiz	20 000
Edag in tàgare wa zuwwuran in HOHENHEIM/ICRISAT/IFDC	60 Kg 15-15-15, ilmixsul in 6 g dæg ebawel ,dàd ekab	12 000
Froje wan aratan in magyakan /ICRISAT	20 Kg DAP, ilmixsul in 2 g dæg ebawel ,dàd ekab	4 400

II Esimmiriwriw in mikrazan dæg cugas in magyakan

2.1. Almigna n esimmiriwriw in mikrazan

Esimmiriwriw in mikrazan yofâr dæg awatay 1975, yofâr-tu froje wa innittafan d asedur n addawlât (PCN). Cimxutar aggotnin ikayafnat tittit n innizam way d izizziki n issigilan in PCN; mifrag ad nimil:

- Iba n siqqil n asaggawar wa ewalan d ekkas n assak dæg mikraz;
- Innikud in magyakan dæg mikraz win dasan itwâmalnin (imugnu id wa nazzin);
- Iba n aggad in musanan dæg agamay ;
- Iba n masnat in tikarsawen n azzaman fel esusin in mikraz ;
- Iba n ewat n ijinna

2.2. Esimmiriwriw in mikraz is CEP is agawaran in magyakan



Isaknan taffin turagat n isinnifrin in mikraz win olagnin id win itwaranin d'ag edag

- *Deranan :*
 - Esissixi n asedur wan gawnan
 - Esissixi n innyaten in magyakan id tegawert in mann-àsan
 - Ezizziki n mikraz in daggan
 - Esimmigni n wa iljaman ak iyyàn
 - Afanaz in wa n azzin mikrazan win iknanin
- *Ilmigna wa iljaman ak iyyàn*
 - l'INRAN tiffu ilmikrazan win azzarnin ;
 - Edag in tiffa in mikrazan win azzarnin wan losa iffu ilmikrazan n affar ;
 - Idaggan in mikrazan win zawwarnin innittafan d allay in mikraz M1 id M2;
 - Allay in M3 taggin – tu isimmiriwraw in mikraz d'ag edag in CEP
 - Ezinzi innittafan dir- is butikan win aratan in cugas .
- *Firrin d ekinnin n àdag*

Edag wa he d'ag agu akaraz itiwara ad igda ad amos inka ; amadal yaha izzezil fel enale d amadal taha talaq fel abora . Fel esimmigni, takarse ta n arras inta a ittagazan irawan win din abagnin iman-asan d'ag cugas fel agaraw ja tegalangalt timmignet:

- Fel rawan n iskan win zagrotnin inken (Gao): 25 n àdar fel ektar ;
- Fel rawan n iskan win agodaynin inken aborag (Adoua): 100 n àdar fel ektar ;
- Fel rawan n iskan win absig inken (Sabara): 400 n àdar fel ektar



Diffir esimmigni n àdag ad nissinkir amadal in tawagost fel ad iqqil immignat

A wa ittiwaran:

- Fel enale meda abora ad tilla agir in 150 har 300 m n alwasa iglayan tegalangalt ta n esinmiriwriw fel esigig-net cugas , d'ag tegalangalt ta nifrag ad nikriz tanzant meda marmaso .
- Fel tanzant meda marmaso, ad tilla agir in 50 har 100 m n alwasa iglayan tegalangalt ta n esinmiriwriw fel esigig-net cugas tin ahoznin; d'ag tegalangalt nikriz ilmikraz inten enale meda abora .

2.3. Esigir n immignu n ilmikrazan :

- Afris n inibbug,
- Allug,
- Afris in tobdiga...



2.4. Tikarsawen n akaraz/ enale

- Ekinni n mikraz s amagal n azzaman (Tiyoral) : 10 kg fel ektar
- Esici n kabban in sezam dâg mikraz dâg daggan win iknanin
- Ijil n akaraz : ijinna wa yazzaran(20 mm meda a izgaran day)
- Tegalangalt : 1m X 1m, dâg inki 10.000 n abawel fel ektar
- Esigit : igit in biwlan (enay n alkad wa n esigit)
- Ekkas : karad (3) iskan dâg ebawel dâg cizarat
- Enittif : esinkir d ekkas n alummuz s agamay
- Ekinni is miglan : s agamay dâg esigid
- Ekkas n iskan win irinnin, ikraynin meda wir nikka



2.5. Tikarsawen n akaraz/ abora n efay

- Ekinni n edag dât jinnawan
- Ekinni n mikraz s amagal (Tiyoral) : 40 kg/ektar
- Ijil n akaraz : ijinna wa yazzaran (20 mm meda a izgaran day)
- Tegalangalt : 0,8 m X 0,3 m, dâg 42.000 n ebawel/ektar
- Esigit : igit in biwlan (enay n alkad wa n esigit)
- Ekkas : karad (3) iskan dâg ebawel dâg cizarat
- Enittif : esinkir d ekkas n alummuz s agamay
- Ekinni is miglan : s agamay dâg esigid
- Ekkas n iskan win irinnin, ikraynin meda wir nikka

2.6. Tikarsawen n agayak/tanzant

- Ekinni n amagal (Tiyoral) 15 kg/ektaar
- Ijil n akaraz: ad awid 15 in tellit ta n juwiye
- Tegalangalt : 0,6 m X 0,80 m n ilmikraz yolagan, meda 0,5 m X 1,50 m n ilmikraz
- Esigit : 100 kg/ektar s immignu meda 200 kg/ektar s irigis

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- Enittif : : esinkir d ekkas n alimmuz s agamay
- Ekinni is miglan : s agamay dâg esigit



2.7. Tikarsawen n agayak/marmaso

- Ekinni n amadal dat jinnawam
- Ekinni n mikraz s amagal n azzaman (Tiyoral)
- alwaq : ijinna wa yazzaran taha tinfa (20 mm meda a izgaran)
- Tegalangalt : 0,4 m X 0,15 m, dâg inki 166.000 n abawel /ektar meda 0,5 m X 0,10 m, dâg inki 130.000 n abawel /ektar
- Esigit : 50 kg/ektar s immignu meda 75 kg/ektar fel ektar s agoda
- Enittif : esinkir d ekkas n alimmuz s agamay
- Ekinni is miglan : s agamay dâg esigit



2.8. Allay d igi dâg buhutan


Issigilan n allay, esigir, alabay immîkkan ad igin s immignu . Igi dâg buhutan itâg s immik was taran imazanzan (tagbit ta n 1kg, 5 kg meda buhu wa n 50 kg)

2.9. Ekkas n assak in mikraz

Issigilan n igi/ esimmiriwriw in mikrazan innittafan dir-sa serwian win agayak, takkasnin assak.













III Ezinzin n aratan cugas

3.1. Timxutar in zirfan in magyakan id nazzan n aratan in cugas

	<p>Alwaq wan allay, imgyak izanzin tinfawen-net is targast</p> <p>A wa nazzinat tinfawen cina tatinat a yokkayan 50% dæg Alwaq wan karazan.</p>
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3.2. Ozibna : takarse tolagàt fel ezinzi

Ozibna i imgyak itaffe ad igriw azrif fel ad igu issigilan (AGR), ad isinsa aganna tinfa-net s ozibna fel arrazam n azrif wa ikkal . Almignan n ozibna itaggu s inka:

	<p>1. Gur alley,agalak n asaggawar ad issidilan asaggawar irribix in tinfa n agayak. Arat wa insane, yaddewan gur allay, itiwalassaf, iga amagal, izzar insa dæg akal dæg edag immigne izzar iqsalan</p>		<p>2. Asaggawar igmiy dæg asaggawar wan (IMF) n akal ad tiffu ozibna n awa insane. asaggawar wan imf iniy a wa tillan fel ad issi iddukad d illug d immik wa sinsa.</p>
	<p>3. Immos asaggawar igrazas a wa insan d immik wa sinsa, asaggawar in magyakan id abbarbaran mangaza izzar igin ifus fel isirud wa izzizakken tarrayen in likkum n awa insan issigilan inlikkum d ilmigna n immik wa he sitwidis mangaza inken assak n arrazam</p>		<p>4. Fel affar n ezizzikki n enmirda, isagawaran issin (2) asaggawar wan magyakan id wa ittafin azrif igin ifus tiffan n ozibna yewadan 80% n arat wa insan a wa inazzu wa igmadan. Enmirda iga fel issigilan win maccoknin d immik n arrazam.</p>
	<p>5. Ozibna wa iffa asaggawar n azrif, itwizan i agalak n asaggawar wan magyakan fel issigilan (AGR) in man-asaàn .</p>		<p>6. Ak awidum n asaggawar ila tegadart-net tan irriyalan, fel ad igu issigil wan man-net, fel ad irzima a wa ikkal izzar igriw irribix.</p>
	<p>7. Dàt alwaq n arraman n ozibna i asaggawar n azrif, asaggawar in magyakan isidiw-du izirfan dæg agalak n asaggawar arat wa jiwaran.</p>		<p>8. As d atwasedaw azrif kullu, asaggawar wan magyakan irzimin dæg alaq wa itwazazakken.</p>
	<p>9. As irzam ozibna kullu, asaggawar n azrif ikku akal fel ekkas in fassan-net dæg d arat wa insan fel toga ilgidir irrar yalim mangaza.</p>		<p>10. Imgyakan ifragan ad inizzin aratan-nasan irrar irbixan a wa din inazin gur alwaq wan affar.</p>
	<p>11. Yallah tizza, d azrif wa tillan n asaggawar in magyakan d agalak-net (aratan win d erawnin issigilan + esici wa n azzin aratan n cugas), asaggawar in magyakan ifrag ad igu tagoten irtaynin in aratan n cugas dāt affar n issigil.</p>		<p>12. Yallah tizzar, ozibna aratan n cugas inzanin s immignu d imittal in miglan n cugas s igaci d allug izzar dæg alwaq.</p>






3.3. Inazzan s asaggawar d ozibna

Takarse ta tolag fel asaggawar ilan azrif n affar fel ezirrigiz n izinzi n aratan cugas i agalak-net.

	<p>1. gur allay asaggawar in magyakan isidiw izzar izin zin i agalak-net aratan cugas. Dàg inki asaggawar ila azrif n affar</p>	<p>Ara twa yaha dàg issuk</p>  <p>+</p> <p>Ara twa izizzakkat amniy wa zuwwuran</p> 
	<p>3. asaggawar in magyakan iqqal imawal in wa d tillan dàg buhutan a he issinsu toga ilgidir fel tifa n ozibna. S ozibna., asaggawar ad igu issigil taha tinfa (AGR) .</p>	<p>A wa d inza</p>  <p>+</p> <p>A wa iqqal</p>  <p>Iribix kullu fel nazzan izunan ger asaggawar d agalak</p> <p>4. Gur arrazam n ozibna , asaggawar in magyakan izinin yaffu imadhalan tanat ta tit wazakket dàt fel irribis in nazzan. Asaggawar ittif Iribix wan issigilan win maccoknin (AGR).</p>

IV. Imittal in miglan s agamay irtayan id tizant ger butkan in miglan

4.1. Immik n agamay irtayan in miglan

 <p>1. Ak asaggawar in magyakan ad imil iddiruraten in madhalan-net inmiglan in cugas</p>	 <p>2. Isaggawaran isidiwan iddiruraten n isaggawaran win madhalan, isirtiyan isistanan kullu.</p> <p>Igmiyan dàg imazanzan fel ilalan in miglan wir nizgar dàg alwaq..</p>
 	<p>3. Imaffan miglan a wiyantan har gur mangaza</p>
	<p>4. kofratif in miglan tanzanin imiglan wini ti wir ozibna.</p>

V Aggaz in sàlàn n azzan

5.1. Iddirurat ta n sàlàn

Imagyakan arân isàlàn nazzan fell:

- a) Issuk in miglan
 - A wa tillan
 - A wa inazzu

- Immignu

b) Issuk n aratan

- Imazanzan
- A wa inazzu
- Iddukad n immignu
- Immik n adanay

5.2. Ilmigna yassolan n aggaz in sàlàn

- 1) Eggaz n imagyakan asaggawar in magyakan (OP) ;
- 2) Eggaz n asaggawar , asaggawar wa zuwwuran (tartiyt, asaggawar wa zuwwuran)

5.3. Isàlàn fel rawan

- Dàg rawan win iknanin n milkrazan in tamert in jinnawan, serwis inmiglan, n isissiwil, n n adanay d ilqanun wan magyakan (SICCLA)
- A wa iqqalan irawan in firgan, asaggawar wan ICRISAT

5.4. Isàlàn fel miglan

Edag wa zuwwuran n edal n iskan (DPV)

Tisikkemt in muzaran in miglan n azzaman (ADIPHYTO).

5.5. Isàlàn in nazzan fel ezinzi n aratan in magyakan

- Ilmignatan in sàlàn fel issukan n akal id SIMA-C
- Izirfàn in sudar
- Tarrayen n inizinzi n aratan in magyakan is tamawen :
 - Asaggawar n agg akal in musanan in tamawen (ANIPEX) fel inebilan win tanzant, suse , sezam, albasa id barqannu.
 - Gur inebilan win firgan, FCMN
 - Minister wa innittafan d izizzikki d ikinni.