

# AMNIR N UFARES N ZZEEFRAN AGAMAN DEG TEMNADT TAYURART N UNZUL N LEZZAYER



Imeskaren : Aissa BELHADI<sup>1</sup>, Fatah AMEUR<sup>1</sup>, Amine OULMANE<sup>1</sup>, Ahmed BENMIHOUB<sup>1</sup>, Youcef ALIOUA<sup>2</sup>, Ahmed BOUTEMED-JET<sup>2</sup>, Belaid HANSALI<sup>3</sup>, Belhadj TIRICHINE<sup>4</sup>, Muṣṭapha SAOUDI<sup>5</sup>, Latreche KACEM<sup>5</sup>, Nicolas FAYSSE<sup>6</sup>, Samia AKLI<sup>7</sup> <sup>1</sup>CREAD ; <sup>2</sup>Tasdawit n Tγerdayt ; <sup>3</sup>INSFP-Tayerdayt ; <sup>4</sup>DSA-Tayerdayt ; <sup>5</sup>Imezẓawen n zzeefran n Tγerdayt ; <sup>6</sup>UMR G-Eau, Cirad, Tasdawit Montpellier akked Tsudut Tayelnawt tasnigrant n Tunes; <sup>7</sup>ENSA

# TAZWERT

Zzæefran, ulamma yella seg zik deg Lezzayer, tuyalin yer wuzu-s tella-d deg 2010. Ur yelli d imyi yettwassnen. Tafellaht-is, ur as-yettunefk ara wazal, ladya s yur tsuda tifaksunanin n tfellaht. Tagnit-a, tegla-d s lixşas n yimniren akked yiybula i d-yettmes-layen yef yimyi-a n lleffaḥ.

Anagar snat tferrtin n yisefka i yemmugen yef useddu n tfellaht-is. Yiwet s yur Usemmas n Unadi Ussnan akked Tenfakuşt yef Temnaḍin Tiḡurarin (CRSTRA-Beskret), ma d tayeḍ s yur n Tsudut Tanfakuşt n Usnerni n tfellaht tanezrufant (ITDAS-Beskret).

Tasudut Tayelnawt n Unadi Tanzegwat (INRF) tessufey-d dayen amnir amezyan n useddu anfakus n tfellaht n zzæefran (wali asebtar n facebook n l'INRF).

## AMEZRUY AKKED TIXUTERT N ZZÆEFRAN

Zzæefran (*Crocus sativus* L.) d aeqqar i yeḡlayan akk deg umaḍal (Melnyke et al., 2010). Aṭas n tira i d-yemmalen amezruy aqbur n wuzu n zzæefran deg Lezzayer, ladya deg temnaḍin n Tbessa, Qşentina d Bgayet (Khodir, 2024). Syin, tafellaht-a, truḥ tener s tmental ur nban ara. Deg tallit n temharsa, ærḍen ad t-zzun (Chevalier, 1926 ; Zobeidi et Benkhalifa, 2014) maca, asenfar n usnerni n zzæefran yettwaḡḡ s tmentil n tegrawla.

Seld timument, tafellaht n zzæefran tuyal-d deg 2010 deg kra n temnaḍin n usammer, ladya deg Lemsaret deg lwilaya n Xencla, seg yimaren, tennerna. Seld mraw n yiseggasen, tafellaht-a tban-d deg yidgan ilan anezwu i iwulmen deg tmurt (Idurar, sswaḥel, timnaḍin tigensayin, tiwri-rin tunnigin, tiwri-rin n tzegwa tunnigin, timnaḍin tinezrufanin, (Zobeidi akked Benkhalifa, 2014 ; Tozanli, 2018 ; Bengouga et al., 2020). Deg lwilaya n Tyerdayt, (Anzul n Lezzayer) tekcem-d d tamaynut deg 2016 (Benmihoub et al., 2022).

Amnir-a «Anmir n ufares n zzæefran agaman deg temnaḍt tayurart: anzul n Lezzayer» yemmug i ferru n lixşas n yirman infakusen yerzan afares n zzæefran.

Leqdic-a, yeflali-d seg usegrew gar waṭas n yimek-kiyen (imnadiyin, imeggiyen n usnerni n tfellaht, tisuda n usiley deg tayult n tfellaht akked yifel-laḥen), deg usenfar «Massire» (Aman d usnulfu aqewwaran deg temnaḍin n Lmeyreb), deg uḥric-is «Akala n wugar n yimekkiyen n zzæefran».

Amnir-a, yebḍa yef semmus n yixfawen. Amezwaru, d asissen n zzæefran akked takkayin n wuzu-ines yemgaraden. Wis sin yerza ayeḡber (biofertilisation). Wis kraḍ, yeena aḥric n usway. Wis ukkuḡ, yettmeslay-d yef waṭtanen-is (phytosanitaire). Yer taggara, wis semmus; yerza agmar, asexzen akked usefti n yimyi-a n lleffaḥ.

Zzæefran, seg yimyan n yisufar n lleffaḥ, yettwase-qdec deg tujjya tamensayt i usejji n kra n waṭtanen am uqelleq, asifses n uqraḥ akked useḡhed n yizri, (Ghanbari et al., 2019 ; Koşar et Başer, 2020). Deg imir-a, *C.sativus* L. d asentel iyef i d-llan leqdicat lqayen deg usnidi, iwakken ad zerwen ugar tulmi-sin-is n usejji n waṭtan n lkunsir, aṭtanen n ukras n yizuran (neurodégénératives) am l'Alzheimer d urgigi (le parkinson) akked useḡhed n unagraw n useḡbiber n tezmert (Bişti et al., 2020; Mokhtari-Zaer, 2020).



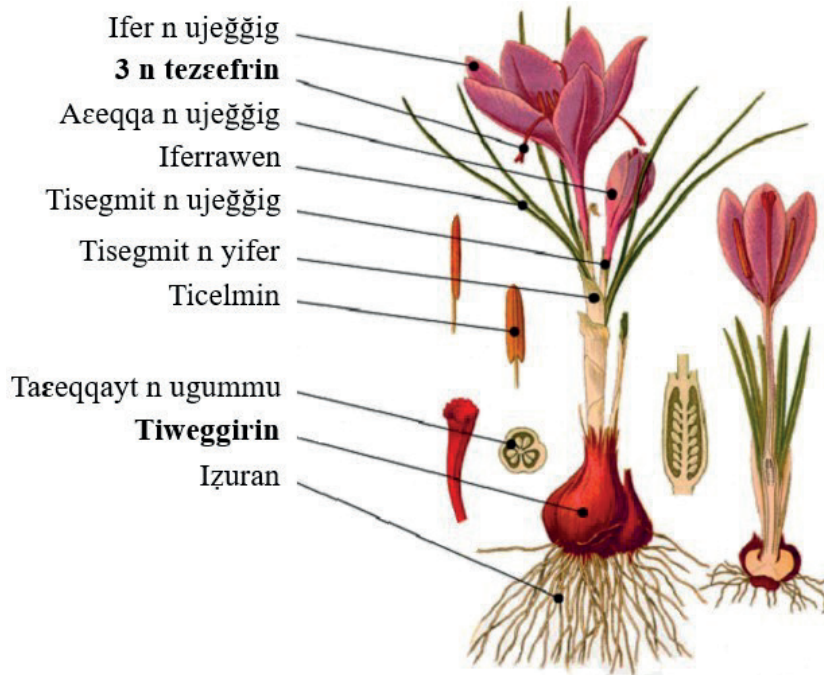


## Imyi

Tawacult n (Iridaceae) iyer yettekki zzeefran, deg-s azal n 1800 n tewsatin (Dupont, 2007). Imyi-a yettefrurux s wuzu n tweggiren-is.

Iferrawen n yimyi-a, msedfaren, mgaraden deg teyzi gar 30 yer 40 cm, yezzi-as-d yini amellal yef yiran ama s ddaw s ufella.

Ajeḡḡig bu 1 yer 3 n wuṭṭunen, yal tikkelt yessefrurux yef snat n tikkal. Yal yiwen yettwatṭef s tyanimt tamecṭuṭt s ddaw n wakal, ttqabalen-t-id tferrawin tizdadin. Taqbuct-a n tjeḡḡigt tesea yiwet n tyanimt timdewwert akked 6 n yiqecran n 2,5–5 cm × 1–2 cm s yini alili-azengari ney aqessḥan s yizuran yessulsen, amellal ney alili yer tēnqigt ; ticelmin 3 (étamines 3); tasartut n wadda,ayanibyebdan yef kraḍet n tezēefrin s uzeggay-ačini yettecruruqen, seg 2.5-3.5 cm deg teyzi (tugna 1) (Pl@ntUs, 2015).



Tugna 1. Iḥricen yemgaraden n zzeefran (Patin, 2023).

## Akud n wuzu

Ma yella tiweggirin d timeqqranin, zemrent ad ttwazzunt seg taggara n yuṭt alamma d talemmašt n ctember. Ma d tiweggirin timecṭaḥ, uzu-nsent yezmer ad d-yili seg tlemmašt n ctember ad ikemmel alamma d taggara n wayyur-a.

Ma yella tifaṣniwin n lḥamu qqiment ulint alamma d taggara n yuṭt d tazwara n ctember. Wi yufan, ad

d-yili uwexxer n yizemzen n wuzu yer uzgen wis sin n wayyur n ctember, ney alamma d taggara-ines.

Deg tēgnatin anda i yulint tfaṣniwin n lḥamu, yezmer ad d-yili wuzu deg tazwara n wayyur n tuber, akken ur d-yessutur ara aṭas n waman i usway-is.

## Aheyyi n wakal

Zzæefran yesra akal alqayan, afessas, akiwan rnu d amesbayur deg wayen yerzan leybar. Maca, imyi-a iqebbel akal yellan alma d 20 % n tarešt. Tiɣariwin n yideqqi akked tarešt (argilo-calcaires) d yideqqi akked yijdi (argilo-sableuses) i t-iwulmen.

Ur as-yelhi ara wakal yeččuren d ijdi. Akal i iřaben, yetteawan deg gemmu n yimyi akked ujuğğeg-is (Pl@ntUs, 2015).

Deg Tɣerdayt, semrasen akal n ddehsa i iwulmen i wuzu n zzæefran; d akal amesbayur seg yiferdisen i t-yesselhayen, imi yekka-d seg wakal iluđen i d-yeğğa ugeffur.

D acu kan, imi akal n ddehsa yezmer ad yesu kra n teznin n teħcicin i yettdurrin imyan (i d-ttawin waman), wi yufan ad iheyyi akal i wuzu war uzu n tweggirin akken ad negrent tuget n teznin-nni i yellan deg wakal n ddehsa werğin yežža (alluvion).



**Tugna 2.** Ifellaħen n Tɣerdayt seqdacen ddehsa n wasif «Touzouz» d tissi i wuzu.

Nezmer ad nezzuzer cwit n wakal n ddehsa yef wakal werğin yežzan, syin ad tent-nessew s waman. Iban-d dakken ifellaħen ttağğan ieerramen n wakal n ddehsa azal n useggas send azuzer (asefrek n teħcicin).

## Afran n lqis n tweggirin

Tiweggirin n zzæefran ttawisemlent yef semmus n lqisat (Tafelwit 1).

**Tafelwit 1.** Iebaren yemgaraden n zzæefran d tulmisin-nsen.

Aebar	Tazdayt (cm)	Asemmi imezdi	Amđan n yijeğğigen deg useggas amezwaru n wuzu
0	13-15	Taweggirt tameqqrant	3 n yijiğğigen
1	11-13		1 ujeğğig
2	9-11	Taweggirt talemmašt	75 % n ujuğğeg
3	8-9		50 % n ujuğğeg
4	7-8	Taweggirt tameçtuħt	25 % n ujuğğeg
5	<7		Ieuqquer

Aybalu: yettwakkes-d seg «tiweggirin n *Crocus sativus*» (<https://safrandoc.fr/content/17-bulbes-Crocus-sativus>)

Uzu n yiwen n uabar-a n tweggirin yettili ilmend n yiswan n umežžu n zzæefran. Ma yebya umežžu n zzæefran ad d-banent tezæefrin n yimyi-a, seg useggas amezwaru yessefk ad yefren tiweggirin timeqqranin

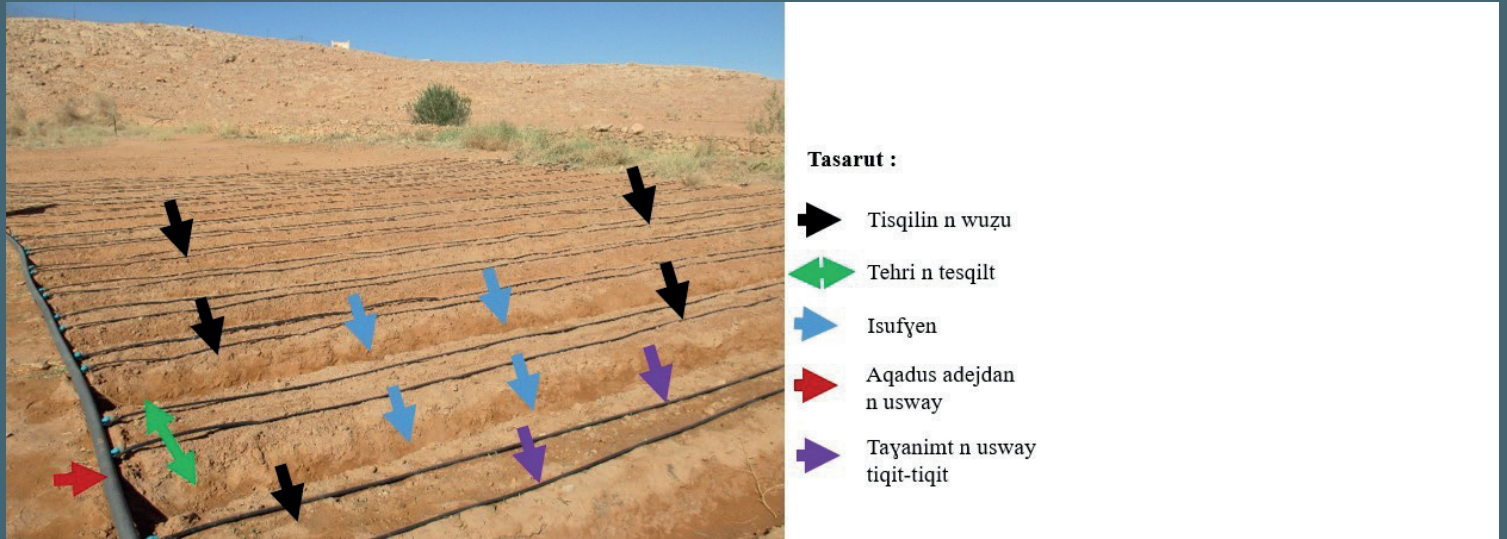
(ladya aebar 0). Ma yella d afares n tezæefrin akked tweggirin i d iswi, d tiweggirin tilemmasin i yelhan. Ihi, ma yella win ittežzun zzæefran yebya ad yessefti deg ufares n tweggirin, ad yefren timeçtaħ (aebar 4).

## Aheyyi n wakal akked d tesqilin n wuzu

Akal n ddehsa i iwulmen i wuzu n zzeefran, yessefk ad yili yenqec, ttwakksen-as yizra d yiceyman.

Seld takkayt-a, ad d-tas tin n uheyyi n tesqilinn wuzu n tweggirt n zzeefran ad yalin seg 25 yer 30 cm i usifses n usuffey n waman seg tenzeefert (tugna 3).

Isufyen, bettun tisqilin, suffuyen aman i izaden, rnu mmugen d tabridt i yifellaħen akken ad xedmen kra n leqdicat yecban aħemmer akked ubraz n leħcic yettdurun.



Tugna 3. Aheyyi ntesqilinn wuzu akked usrusu n uqadus d tyunam n usway send n wuzu n tweggirin.

## Atrak n wuzu n ccetlat

Atrak n ccetlat n tweggirin n zzeefran ad yili ilmend n uəbar-nsent. Ma d tiweggirin timeqqrarin, ma yebya umezzu n zzeefran ad qqiment alama d 3 n yiseggasen, yelha ad yessilqi uzu-ines.

Ameccaq gar tweggirin d yiđerfan n zzeefran ad yili alama 20 cm (Tafelwit 2).

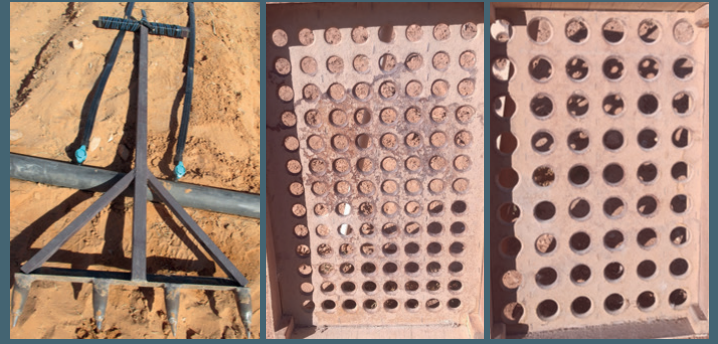
Tafelwit 2. Lqis n tesqilin akked utrak n ccetlat ilmend n uəbar n tweggirin.

Lqisat Tawsit n tweggirt	Ilem gar yiđerfan (cm)	Ilem ga tweggirin (cm)	Telqay n ccetlat (cm)	Lqedd n tesqilin (cm)	Ameccaq gar tesqilin (cm)	Tehri n tesqilin (m)	Teyzi n tesqilin (m)
Taweggirt tameqqrant	15 yer 18	15 yer 18	15 yer 18	25 yer 30	20 yer 25	01	S ufran
Taweggirt talemmašt	12 yer 15	12 yer 15	12 yer 15	25 yer 30	20 yer 25	01	S ufran
Taweggirt tameçtuħt	10	10	10	25 yer 30	20 yer 25	01	S ufran



## Allalen

Deg wuzu n yimyi n zzæefran, yessefk ad ilin kra n wallalen: am lbala (tafluct), d uxebbac, d umdir (ččappa) akked wallalen yettwaxedmen s ufus i yettuseqdacen kan deg tenzeefrin. Wi, ad sifessen kra n yirmad am wuzu d ferru n tweggirin ilmend n temyer-nsent (Tugna 4).



**Tugna 4.** Allal n tyuzi n yixejdan n zzæefran (zelmeđ) akked yiwerbalen i ferru n tweggirin tilemmasin (talemmašt) d tmeqqrarin (yeffes).

## AḠEBBER

# 02

### Timerna n leybar

Ama d ifellahen i yesæan tibħirin n zzæefran d wakal yelhan, ama d wid yettezzun deg ddehsat n yisafen. Leybar yesæa azal d ameqqran deg uheyyi n wakal i wuzu n tenzeefert, ladiya wid yessexdamen akal n ddehsat.

Yaas akken akal n ddehsat yelha nezzeh, acku d alud i d-gellun waman n ugeffur, maca imi yal aseggas rennun-d fell-as wiyad, imezzawen n zzæefran ttwaħettmen ad d-awin akal n ddehsa amaynut yal krađ iseggasen.

Annect-a yessuter-d tadrimt tameqqrant deg useddu n usenfar n tenzeefert. Maca, timerna n leybar seg useggas amezwaru ad d-tawi lyella alama d aseggas wis semmus yerna ur tettaylay ara am asmi ad yettubeddel akk wakal-nni n ddehsa.

### Izem n n leybar

Aseqdec n yizem n leybar (Tugna 6) deg wuzu n zzæefran yezmer dayen ad d-yeglu s ubayur deg takkayt n unegmu n yimyan. Izem-a n leybar ad



**Tugna tis 5.** Leybar yelhan (yettwaeqal s yini aras aqeshan).

as-d-yefk srid iferdisen i yesra. Ugar n waya, nezmer ad nsegrew gar yizem n leybar d waman n usway.



**Tugna 6.** Afars n yizem n leybar s ufus. Seld aselxes n leybar yefsin deg waman ad yemmagg am latay ad yizdig i wakken ad yettuseqdec.

Afran n leybar ara yettusxedmen yesæa azal d ameqqran iwakken ad d-yeffey zzæefran yelhan.

S umata, uẓu n zzæefran yelha ad as-nexdem cwit n lazut (azote) d waṭas n lfusfuṛ (phosphore) d lpuṭasyum (potassium), yef wannect-a yessefk ad nefren leybar i yesean iferdisen imeqqranen n (N-P-K) akked yiferdisen imeẓyanen n (Mg, Fe, Zn, etc.) s lqis. Yessefk ad yettwaqader leɛbar n yiferdisen-a akken i ten-id-uran yef yisendyaq ideg i d-ddan, iwakken ur tṭyaren ara yiferrawen-is.

## AḤRIC N USWAY

# 03

Asway d aferdris agejdan deg tizin n zzæefran, ladya deg temnaḍin tiyurarin am Tṭyerdajt, ideg ur d-yekkat ara ugeffur s waṭas. Ma yella yewwet-d, ur d-yekkat ara deg lawan i iwulmen. Iwakken ad yili umriri s waṭas, yessefk ad neḍfer tafada n usway yebnan yef yisefkan n unezwu adgan, ayen akk yesra yimyi akked tṭyara n wakal. Ma nezra ayen i as-ilaqen d aman ur d-nyelli ara deg tagnatin anda ad zaden ney ad xasen waman, ayen ara d-yeglun s lixsas n lyella akken ḍayen ad d-banen waṭṭanen iberčëččanen s tmentilt n uṭuqqet n waman.

Asway s waṭas yezmer ad iḍur lqæa, yemmun yizuran, yesnernay ugar aṭṭanen iberčëččanen, yecban Fusarium, i yettnernin deg wakal illexsen. ḍayen, zzyada n waman zemren ad æerrin lqæa seg yiferdisen i as-yellan d igejdanen ladya akal ijdi. S wakka, imyi ur yettnerni ara.

Maca, lixsas n waman yettawi-d ayurar. Dya yessenqas deg unegmu d ujuḡḡeg n zzæefran. Ayurar yessenqas seg ukala n tsemllilt n tafat d yiferdisen n yimyi (tawlaft-tasemllilt: photosynthèse). Annect-a yezmer ad isenqes seg gemmu akked ujuḡḡeg-ines, rnu yer waya yessenqas tizzæefrin n zzæefran. Asway ur nelha ara, yezmer ad isenqes, ḍayen ṣṣaba n tfellaht-a.

Iuselḥu i iwatan, ttwasqedcen kra n yinefkan inezwanen i d-uwin seg teysert n Tṭyerdajt, am yisallen yerzan tafesna n yimyi (Kc) akked yinefkan n tṭyara n wakal.

Iyewwaren-a, skanayen-d ayen i yesra zzæefran deg yal takkajt n unegmu-is. S tallelt n useẓzan «CropWat», nezmer ad nẓer ugar n wayen i ilaqen i wuzu n zzæefran.

Akken i d-iban, asway n zzæefran deg temnaḍt n Tṭyerdajt ilaq ad yili s wazal n 500 mm i useggas (5 000 m<sup>3</sup>/ha).

Annect-a yeskanay-d dakken zzæefran ur yesri ara aman am yimyan-nniḍen i d-imeqqin deg tewtilin i t-icuban. Amedya, imenda ḥwajen azal n 1500 mm, annect-a yeskanay-d aqazem n yimyi-a i uyurar.

Azal n uktazal-a meqquer yer yifellaḥen, acku yetteawan-iten deg useddu d useggem n teybula n waman s wudem i iwatan d wudem i idumen. Ma nezra ayen i yesra yimyi-a d aman, ur d-yettili ara usenzeε n waman akken ḍayen ad yenqes userref n tedrimt deg-s (Tafelwit tis 3).

Tafelwit 3. Kra n yiwellichen i iwulmen i uselḥu n usway.

Takkayt n unegmu	Ayyur	Asnagar n usway	Tifakusin d yisnasen n usway
Send uẓu	Taggara n yuct-tazwara n ctember	1-2 asway i igerrzen	Asellexs n wakal i usifses n useqdec n tebbent yeqqazen ixejdan akken dayen ad yili wakal yebzeg mi ara ad ttwazunt tweggirin.
Uẓu	ctember	2 tikkal deg yimalas	Asway n wakal s waman tiqit tiqit iwakken ad yeqqim neddaw.
Send meqqi	tuber	2 tikkal deg yimalas	Akal illexsen yetteawan deg meqqi n yimyi. Ad nger tamawt yer tesmekta n waman n ugeffur i d-yetteylayen iwakken ad nzer aḥal i as-ilaqen d aman i yimyi.
Gemmu n yiferrawen	tuber-unbir	2 tikkal deg yimalas	Asway aslukzan d uslagan yettak tallelt i unegmu n yiferawen. Ayummu n wakal s (tizin n teydayt yeqquren, ifurkan n yisekla akked yisuyar n yimyan) iwakken ad yeqqim wakal neddaw, rnu asenqes n teḥcicin yettdurrun. Ayummu, yessehbir dayen yef wakal iwakken ur t-yetteerri ara waḍu .
Ajuḡḡeg	Unbir-t azwara n duḡember	2 tikkal deg yimalas	Iwakken ur yettili ara waṭṭan n yijeḡḡigen, ur ilaq ara ad isew s waṭas. Asway n yimyan yelha ad yili deg taggara n wass iwakken ad nefk akud i yimyi ad isew aman s ttawil. Aseqdec n tiqit tiqit iwakken ad awḍen waman srid yer yizuran.
Anerni n tizegzewt (Takkayt n tegrest).	duḡember - yennayer	1 tikkelt deg yimalas	Imi deg sin wayyuren-a semmed lḥal, yessefk ad yenqes usway n zzeefran.
Send-agmar	Azgen wis sin n yibrir	War asway	Asehbes n usway iwakken ad gmunt tweggirin akken i iwata. Ilaq ad yekkaw wakal send agmar dayen ad tifsus tukksa n tweggirin d usenqes n lexsara.



**Tamawt:** Yal asway\* tiqit tiqit ad d-yefk 10,42 l/m<sup>2</sup> deg 39 n tesdidin d 23 n tsinatin: - s wutrak n 30 n tmiqwa/m<sup>2</sup> ; - akked tazla s tifi n tiqit n 15ml/1,7 n tesdidin

\* : 48 d asway deg tallit n meqqi n zzeefran deg Tyerdayt.



Mi ara yili wakal d ijdi, ilaq ad neḍfer kra n yisurifen iwakken asway ad yenfeε. Acku akal-a ur yettaṭṭaf ara aman, ihi yesruḥuy iferdisen yelhan deg-s. Yefwaya asway ilaq ad yili yal ass, s tesmekta timec-taḥ. Rnu yer-s, ahil n usway ilaq ad yili tanezzayt ney tameddit.

Annect-a yettaḡḡa imyan ad swen akken i iwata s teyzi n wass. Tarrayr-a n usway tettemgarad s umata ilmend n tsekka n wakal, anezwu akked lqidar n waman n ugeffur. Ihi, yelha ad nger tamawt yef wayen yerzan abzag n wakal akked usway n zze efran.

## TAYULT N WAṬṬANEN N YIMYI-A

# 04

### Ibeεεac

Iferrawen d yijeḡḡigen n zze efran ur ttezzin ara fell-asen yibeεεac, acku mi ara yejuḡḡug zze efran, ibeεεac ttilin deg tallit n tguni-n sen akken dayen ur

ttafen ara akud ad d-zeḍmen deg lawan n tukksa n ujeḡḡig mi ara ilin remden.

### Inegracen (Ijerbaε, iyerdayen,...) d yigḍaḍ

Azdam i ixedmen yiwersiwen yef zze efran s umata d (Iyerdayen d yijerbaε), Igerzaz d yigḍaḍ (tisekrin, d Roselin githagine),...).

Iyersiwen-a, sengaren kan iferrawen n zze efran, anagar tisekrin i d-yessekfalen tiweggin. (Tugna 07)

Iwakken ad nmager ugur n iyerdayen d yigerzaz n lexla yessefk ad as-d-nezzi s zzerb arqiqan ara ikecmen deg wakal azal n 50 cm i tibḥirt n zze efran, akken ur tt-sengaren ara.

Ma d ayen yerzan igḍaḍ, ggaren-asen ise bdad yettaken anzi yer umdan, dayen xedmen-asen allalen n usterḍeq, aya ad yesseḥbes zzedmat n yiwersiwen.



**Tugna 7.** Iferrawen n zze efran i yettwagezmen (taneccabt tazenḡarit) akked tweggirin i d-yettwakeflen (taneccabt tazeggayt).

## Aṭṭanen iberčēččayen

Tiweggirinn zzeefran iyelli-d fell-asant uberčēčču n wakal (champignon tellurique) iwumi qqaren (Fusariumsp) (tugna 8). Aberčēčču-a, iteddu ama deg tweggirin n zzeefran ur nettwaḥrez ara, ama s temlilit n tewtilin n unerni deg wakal n tenzeefert.

Tukksa n tweggirin-a tiweeranin akked usuffey n zzeefran agaman (war ddwa n yiberčēčča), yuwi-d

ad nezwir deg ufran n tweggirin yelhan send uẓu; asway i iwulmen (ur nessugut ara aman) ; uẓu deg wakal urzim (yettēddi wuzwu, ur iteṭṭef ara aman). Maca, ma yella ccek dakken tiweggirin ama n ccetla-nney, ama d tid i d-nuy, yetṭef-iten waṭṭan-a n Fusarium, yewwi-d ad ttudawan s tguri-nsen deg waman yesean sulfaṭ-nnḥas (la bouillie bordelaise) akked tanigt n taret (oxide de calcium) seld ad ttwazzun.



**Tugna 8.** Iseknan n yiferrawen d tweggirin i iḥuza Fusarium sp.

## Yir imyan

Zzeefran yettqazam yir imyan akken ad d-yawi aman. Akken ad yettwikkas wugur n yir imghan,

yewwi-d ad ttwasusin seg tallit yer tayed iwakken ur ttnernin ara (Tugna 9).



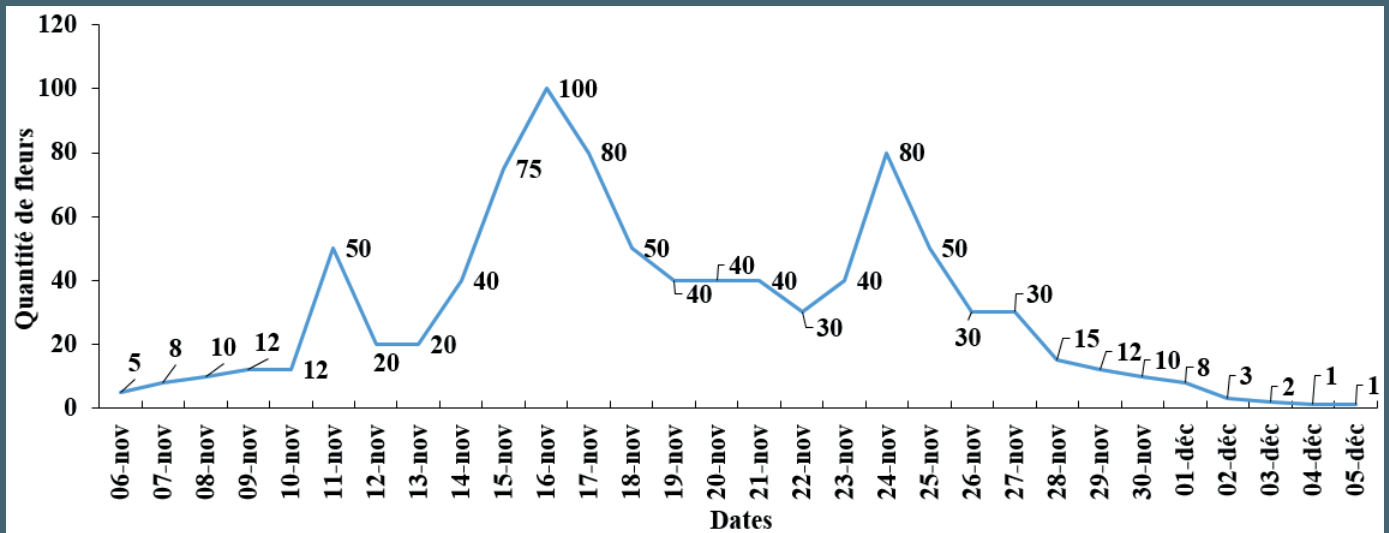
**Tugna 9.** Tanzeefert yettwaḡḡen, ččan-tt yir imyan (zelmeḍ) akked tenzeefert yettwaḥezen, ulac deg-s yir imyan (yeffes).



## Agmar n yijeġġigen, afras n tzeġfrin d usexzen-nsent

Agmar n yijeġġigen ibeddu deg temnaġt n Tjerdayt deg unbir, ikeffu deg tazwara n duġember, itekk azal n wayyur (Tugna 10).

Iseggasen-a ineggura, seg 2022, fessu iwexxer s 10 n wussan seg wakken tmuzyulen ney ttismiden wuġan alamma d azgen n tuber.



Tugna 10. Amedya yeġ tuffya n yijeġġigen yer yiwien n umezzaw n zzeġfran deg Tjerdayt (Tamnaġt Touzouz), deg tallit n umwan 2020.

Agmar n yijeġġigen, yewwi-d ad yili tanezzayt send ad ladin yerna s leħder (tugna 11). Mi yekfa ugmar, ad yebdu usinef n tzeġfrin yeġ ujeġġig n zzeġfran. Kradet n tzeġfrin n yal ajeġġig ad d-ttwikksent s ufus awac awac, yiwet yiwet, akken ur ttwajraħent ara. Tiwtilin n tezdeg ilaq ad ttuqadrent akken iwata.

Deffir n ugmar n tzeġfrin, yif-it ad ttufesrent yeġ lkayed, deg wadeg n tili, akiwan yerna yebbuħran akken ad kkawent. Tuffra-nsen ad tili deg lħila n zzġaġ yerna d azuran (ur nescedday tafat ney azyal akked usemmid) (Tugna 12).



Tugna 11. Ixeddamen gemmen ijeġġigen n zzeġfran.



Tugna 12. Asexzen n tzeġfrin deg lħilat n zzġaġ.



## Asexzen deg tenzeefert yakan

Akken ad nexzen tiweggirin n zzeefran s ddaw n wakal, ilaq ayizi n wazal n 20 cm deg tallit n wuzu-ines (yuct yer umezwaru n ctember).

Uzu yewwi-d ad yili seg tazwara deg yixemjan n 20

ycm akken ad ddarin seg uzyal qessihen n yunyu, yulyu d uct. Yezmer dayen, ad ttwazzunt tweggirin-a deg yixemjan ur nettawed ara 20 cm, ad yumment s walim ney s wayen-nniiden kradet n wayyuren yehman s 2 ar 3 cm (Md. tizin n tezdayt).

## Asexzen berra n tenze3fert

Yewwi-d ad ttwasxeznent tweggirin deg wadeg akiwan, yesean abehri, yeffer yef tafat (tugna 13).

D aya ara yessehbibren yef uttwiy-nsent yerna ad tent-ieiwen deg unegmu (*Fusarium* sp) dya mi ara eiwdent uzu tweggirin-a.



Tugna 13. Tasqift i ilaqen i usexzen n tweggirin n zzeefran.

## Asfukti



Zzeefran, yettwasnernay s tweggirin-ines kan. Deg taggara n unerni n zzeefran (deg tlemmast n yibrir deg Tyerdayt), taweggirt tayemmat tettak-d atas n tweggirin tiggirin yemgaraden ara yilin mmdent i wuzu (tazwara n mayyu almi d tazwara n yunyu ma ieeṭtel).

Asfukti n tweggirt tayemmat yer waṭas n tweggirin tiggirin ad d-yefk i ufellaḥ zerriea-nsent, ad yesnerni tanzeefert-is, ad yessenz akken ad d-yawi isurdiyen.

Iwakken ur ttayen ara waṭṭanen (cryptogamiques; *Fusarium* sp.), afares n tweggirin timecṭah, wi yufan ad asent-yettubeddel wadeg tenzeefert yal ukkuḥ ney semmus n yiseggasen, acku ttemyezwaren gar-asen.



# AGZUL N TEMHAL N TFELLAHT N ZZEEFRAN DEG TEMNADT N TYERDAYT

Tafelwit 4. Tafada n tfellaht n tigawin tigejdanin ara yettwaxedmen deg tenzeefert.

Tigawin n tfellaht	Ayyur												
	Y	F	M	Y	M	Y	Y	Y	C	T	W	D	
Aheyyi n tesqilin n wuzu									x	x			
Ayebber									x	x			
Asrusu s tyanimt n usway tiqit tiqit									x	x			
Asway	x	x	x	x					x	x	x	x	x
Tukksa n yir imyan	x	x	x	x	x						x	x	x
Agmar n yijeġġigen											x	x	
Agmar n tweggin							x						



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# UGAR N YISALLEN

Amnir-a, heyyan-t-id yimnadiyen n usenfar "Massire" s lemawna n ugraw i xedmen zzeefran n Tyerdayt. Seg yinadiyen isnasanen i yettwaxdmen gar 2019 akked 2020.

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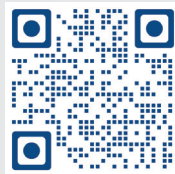
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Aseggem n umnir : Aziza BOUGHANMI

Yeffey-d deg yunyū 2024

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