

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



Imeskaren : Aissa BELHADI¹, Fatah AMEUR¹, Amine OULMANE¹, Ahmed BENMIHOUB¹, Youcef ALIOUA², Ahmed BOUTEMED-JET², Belaid HANSALI³, Belhadj TIRICHINE⁴, Muṣṭapha SAOUDI⁵, Latreche KACEM⁵, Nicolas FAYSSE⁶, Samia AKLI⁷ ¹CREAD ; ²Tasdawit n Tɣerdayt ; ³INSFP-Tayerdayt ; ⁴DSA-Tayerdayt ; ⁵Imezẓawen n zzeefran n Tɣerdayt ; ⁶UMR G-Eau, Cirad, Tasdawit Montpellier akked Tsudut Tayelnawt tasnigrant n Tunes; ⁷ENSA

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 yeḡlayen 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 tenger 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 ukkuḥ, 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).

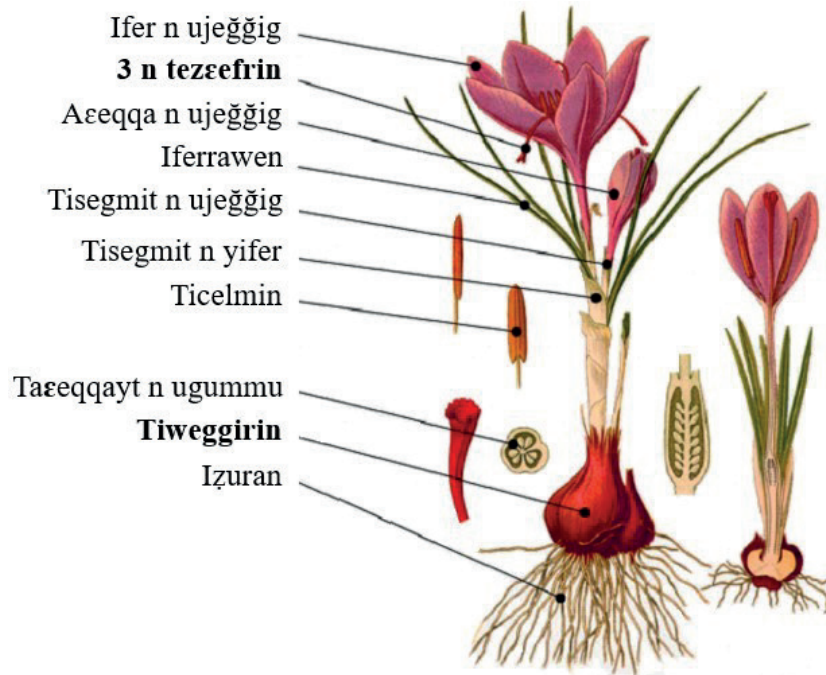


Imyi

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 tesa yiwet n tyanimt timdewwert akked 6 n yiqecran n 2,5–5 cm × 1–2 cm s yini alili-azengari ney aqesshan 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 timecṭah, uzu-nsent yezmer ad d-yili seg tlemmašt n ctember ad ikemmel alamma d taggara n wayyur-a.

Ma yella tifašniwin 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 tagnatin anda i yulint tfašniwin 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

Zzæfran 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 zzæfran; 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 zzæfran ttwasiselement yef semmus n lqisat (Tafelwit 1).

Tafelwit 1. Iebaren yemgaraden n zzæfran 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 umezžu n zzæfran. Ma yebya umezžu n zzæfran ad d-banent tezæfrin n yimyi-a, seg useggas amezwaru yessefk ad yefren tiweggirin timeqqranin

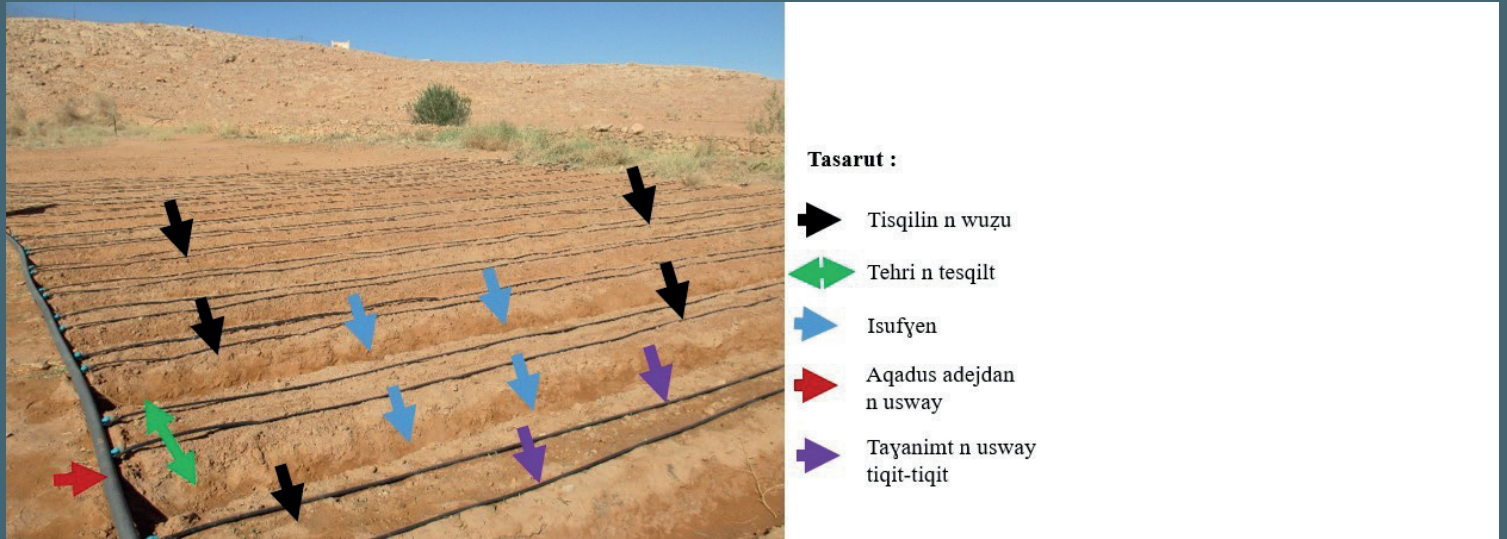
(ladya aebar 0). Ma yella d afares n tezæfrin akked tweggirin i d iswi, d tiweggirin tilemmasin i yelhan. Ihi, ma yella win ittezzun zzæfran yebya ad yessefti deg ufares n tweggirin, ad yefren timeçtaħ (aebar 4).

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 timeqqranin, ma yebya umezzu n zzeefran ad qqiment alama d 3 n yiseggasen, yelha ad yessilqi uzu-ines.

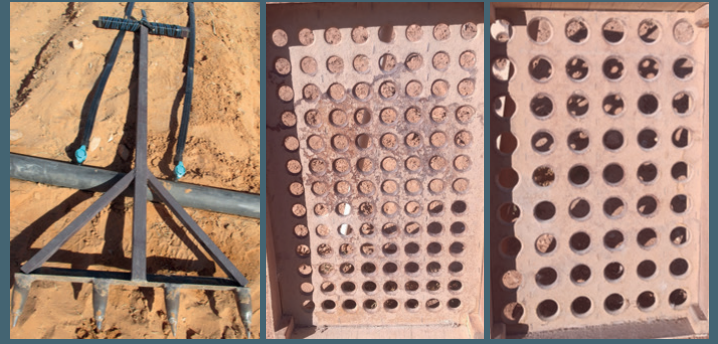
Ameccaq gar tweggirin d yiđerfan n zzeefran ad yili alama 20 cm (Tafelwit 2).

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 yiherbalen 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 cwiṭ n lazut (azote) d waṭas n lfusfuṛ (phosphore) d lpuṭasyum (potassium), yef wannect-a yessefk ad nefren leybar i yesæan 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 tiz̄in n zzæefran, ladya deg temnaḍin tiyurar̄in am Tṭyerd̄ayt, 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 nedfer 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 dayen ad d-banen waṭṭanen iberčeččan̄en s tmentilt n uṭuqqet n waman.

Asway s waṭas yezmer ad iḍur lqæa, yemmun yizuran, yesnernay ugar aṭṭanen iberčeččan̄en, yecban Fusarium, i yettnernin deg wakal illexsen. Dayen, 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 zzæerfran. Ayurar yessenqas seg ukala n tsemllit n tafat d yiferdisen n yimyi (tawlaft-tasemllit: 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, dayen şşaba n tfellaht-a.

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

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

Akken i d-iban, asway n zzæefran deg temnaḍt n Tṭyerd̄ayt ilaq ad yili s wazal n 500 mm i useggas (5 000 m³/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 meqper yer yifellaḥen, acku yette awan-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 usenzæ n waman akken dayen 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, yessehbibir 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/m² deg 39 n tesdidin d 23 n tsinatin: - s wutrak n 30 n tmiqwa/m² ; - akked tazla s tifi n tiqqit 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. Ʋefwaya 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 YIMƲI-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),...).

Iwakken ad nmager ugur n yiwerdayen 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.

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

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.



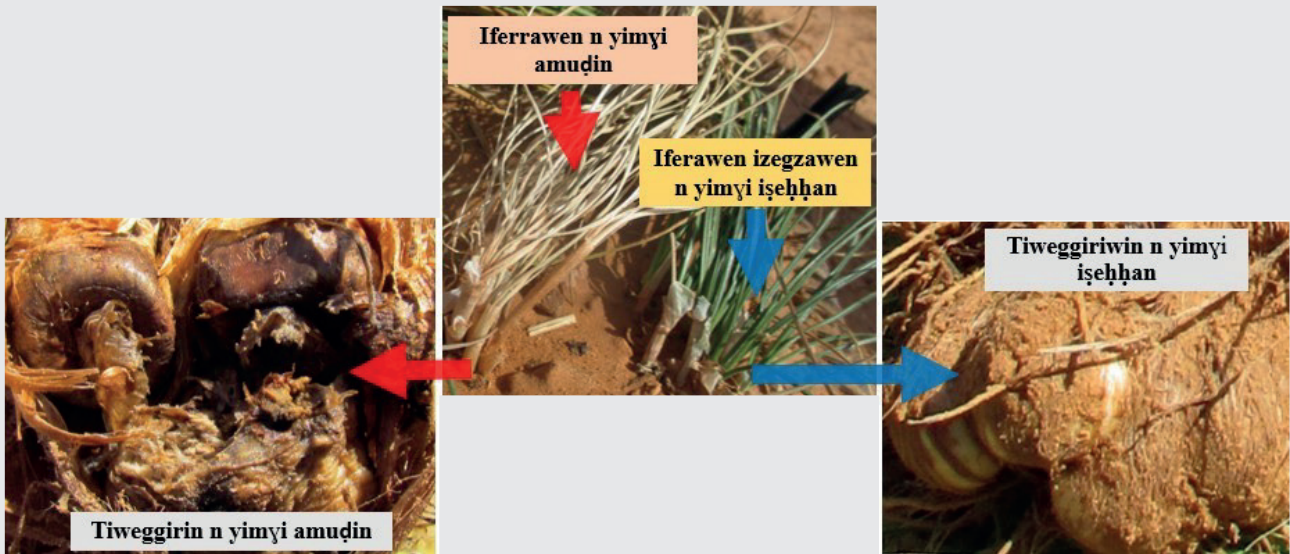
Tugna 7. Iferrawen n zze efran i yettwagezmen (taneccabt tazenḡarit) akked tweggirin i d-yettwakeflen (taneccabt tazeggayt).

Aṭṭanen iberčēččayen

Tiweggirinn zzeefran iyelli-d fell-asent uberčēčču n wakal (champignon tellurique) iwumi qqaren (Fusarium sp) (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).

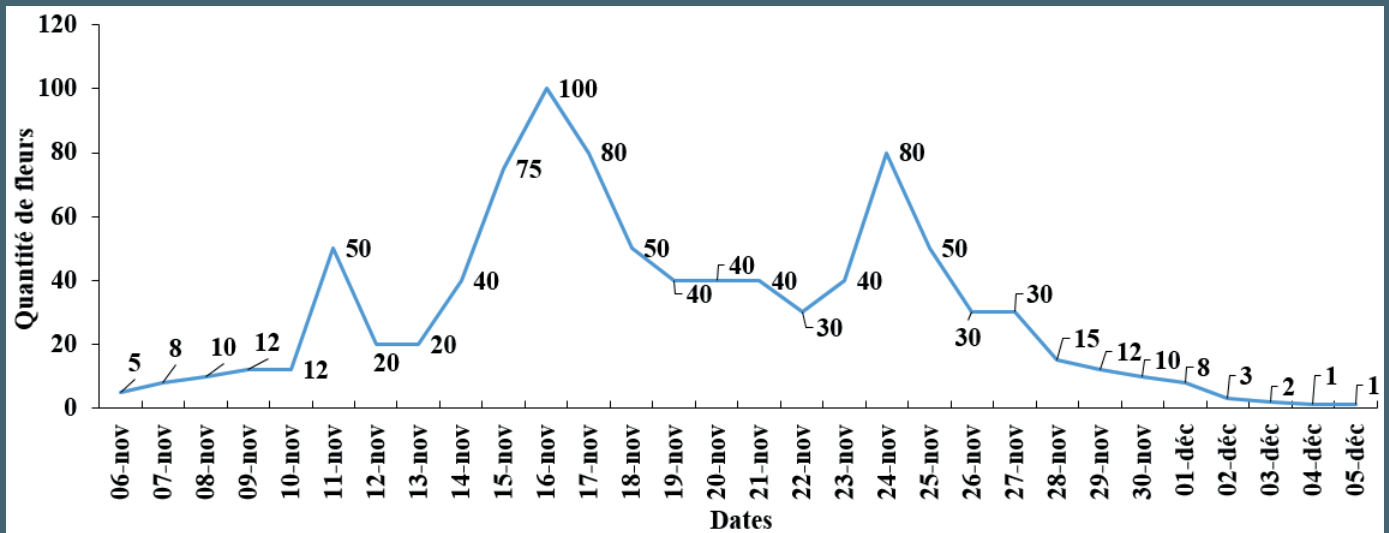


Tugna 9. Tanzeefert yettwaḡḡen, ččan-tt yir imyan (zelmeḍ) akked tenzeefert yettwaḥzerzen, ulac deg-s yir imyan (yeffes).

Agmar n yijeġġigen, afras n tzeġfrin d usexzen-nsent

Agmar n yijeġġigen ibeddu deg temnaġt n Tyerdayt 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 Tyerdayt (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 neseedday 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 tezdajt).

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 Tyerdajt), taweggirt tayemmat tettak-d atas n tweggirin tiggirin yemgaraden ara yilin mmdent i wuzu (tazwara n mayyu almi d tazwara n yunyu ma ieeftel).

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	
Tukksa n yir imyan	x	x	x	x	x						x	x	
Agmar n yijeġġigen											x	x	
Agmar n tweggirin							x						



Chevalier A., 1926. La culture du Safran (suite et fin). *Revue de Botanique Appliquée et d'agriculture coloniale*, 6(60): 490-501.

Bengouga K., Lahmadi S., Zeguerrou R., Maaoui M., Halis Y., 2020. The saffron (*Crocus sativus* L.) cultivation introduction in mountainous oases in Algeria. *Acta Horticulturae and Regiotecturae*, 23(1): 8-11. <https://doi.org/10.2478/ahr-2020-0003>.

Benmihoub A., Akli S., Ameur F., Oulmane A., Faysse N., Mokrani M., Belhadi A., 2022. The emerging saffron value chain in the M'Zab valley – Southern Algeria: an analysis of ongoing dynamics and strategic development options. *New mediterranean special issue 2022*. 117-133. DOI: 10.30682/nm2205h

Benmihoub A., Sraïri MT., Faysse N., Ben Aïssa N., 2024. Promouvoir les filières résilientes à fort impact sur le développement territorial oasien au Maghreb. Note de réflexion, projet Massire.

Bišti S., Di Marco S., Maggi MA., Di paolo M., Piccardi M., Falsini B., 2020. Saffron Shifts the Degenerative and Inflammatory Phenotype in Photoreceptor Degeneration. In : Sarwat M, Sumaiya S (Eds.), 2020. Saffron. The age-old panacea in new light. Academic Press Elsevier.163-176.

Ghanbari J., Khajoei-Nejad G., Erasmus SW., van Ruth SM., 2019. Identification and characterisation of volatile fingerprints of saffron stigmas and petals using PTR-TOF-MS: Influence of nutritional treatments and corm provenance. *Industrial Crops & Products* 141 111803, <https://doi.org/10.1016/j.indcrop.2019.111803>

Khodir M., 2024 « Le safran : histoire d'une épice précieuse ». In Atelier de réflexion pour la mise en place d'une stratégie nationale pour le développement du safran en Algérie et sa commercialisation à l'international, co-organisé par le CRSTRA et le CREAD, Alger, le 2-3 juin.

Koşar M., Başer KHC., 2020. Beneficial Effects of Saffron (*Crocus sativus* L.) in Ocular Diseases. In Sarwat M, Sumaiya S (Eds.), 2020. Saffron. The age-old panacea in new light. Academic Press Elsevier. 155-161

Melnyke JP., Marcone M., Wang S., 2010. Chemical and biological properties of the world's most expensive spice: Saffron. *Food Research International*, 43 (8). 1981-1989.

Mokhtari-Zaer A., Saadat S., Ghorani V., Memarzia A., Boskabady MH., 2020. The Effects of Saffron (*Crocus sativus*) and its Constituents on Immune System: Experimental and Clinical Evidence. In : Sarwat M, Sumaiya S (Eds.), 2020. Saffron. The age-old panacea in new light. Academic Press Elsevier.193-217.

Patin J., 2023. Le safran, origine, histoire, qualité, cuisine. Consultable sur : <https://safrandesaulnes.fr/le-safran-origine-qualite-cuisine/>

Pl@ntUs, 2015. *Crocus sativus* (PROTA). Consultable sur : [https://uses.plantnet-project.org/f/index.php?title=Crocus_sativus_\(PROTA\)&mobileaction=toggle_view_desktop](https://uses.plantnet-project.org/f/index.php?title=Crocus_sativus_(PROTA)&mobileaction=toggle_view_desktop). [Consulté le 14/04/2023].

Tozanli S., 2018. Étude du marché algérien intérieur et import/export de la pistache, de la câpre, de l'amande amère et du safran. PAP ENPARD Algérie, 75 p.

Zobeidi Z., et Benkhalifa A., 2014. La culture du safran (*Crocus sativus* L.) en Algérie. 1ère Exposition Ethnobotanique et 2ème Atelier d'Initiation à la Phytothérapie, Jardin du Hamma, Alger.

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.

Imnadiyen-a, ad ten-tafem deg usebtar-a: <https://massire.net/publications/>

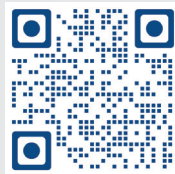
Amnir-a suylen-t-id yer tmaziyt Document traduit par

Mustapha TIDJET, Fatah FETISSI, Atmane REHMANI, Aldjia MEZOUARI, Ali YEDDOU, Hamida CHOUCANE, Hassiba KHERBOUCHE, Khaled FERTOUNI, Khaled MEDDOUR, Makhlouf KACI, Mohammed AGAOUA, Rezkia MESRANE, Smail IGHIL.

Asemmas n Unadi deg Tutlayt d Yidles n Tmaziyt/Centre de Recherche en Langue et Culture Amazigh (CRLCA)



Iswi n usenfar Massire (2019-2024) d aseghed n yimgiyen n temnaḍin tifilalind tyurararin n tefriqt n ugafai usebbedd d usrusu n yisnulfuyen n wallalen n usnerni imezgi n temnaḍin-a.



Aseggem n umnir : Aziza BOUGHANMI

Yeffey-d deg yunyu 2024

Icriken



cirad

Asizref n usenfar s yur

