

## Morocco's seed system makes progress, but some challenges still remain

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### The situation in 2013:

Yigezu et al. (2019) conducted an extensive survey of the seed system value chain of Morocco and performed targeted interviews with over 1,200 Moroccan farmers in 2013. This milestone publication documented that despite tremendous national and international efforts, adoption of new improved wheat varieties of less than 20 years of age was still at a very low level: 42% of national wheat area. Several studies identified different factors that could explain this situation:

- 1) The existing power imbalance among seed companies which led to a substantial monopoly by one company (SONACOS), which in turn caused several shortfalls:
  - a. In absence of competition, the multiplication and distribution of old wheat varieties and European expired PVP was the preferred strategy to keep royalty costs low (Yigezu et al., forthcoming).
  - b. INRA and CGIAR-derived varieties released pre-1990 were therefore the preferred ones, covering over 76% of the certified seed sales (Bishaw et al., 2019).
  - c. Annual certified seeds production could cover only 22-25% of the national needs and the use of "good" seeds exchanged among neighbors (community-based seed enterprises) was by far the preferred choice.
- 2) A stringent catalogue variety testing performed by the national authority (ONSSA) which followed procedures established in 1977, promoting the release of widely adapted varieties with moderate performances at each agro-ecology, rather than top yielders for specific regions/provinces (Yigezu et al., forthcoming), which did not provide vast advantages to farmers.
- 3) A substantial incapacity by the agricultural extension system (ONCA) to determine the best new varieties to be cultivated by farmers and promote them (Yigezu et al., 2019).
- 4) The existence of a substantial gap between farmers' preferred traits and national breeders' goals, pushing the release of varieties that did not meet the farmers' needs (Alary et al, 2020).
- 5) A pre-1970s established system of collection of royalties by the national research institution (INRA), which hinders the uptake of newly released varieties (Bishaw et al., 2019).
- 6) A poorly targeted seed subsidy system, which was received by seed producers rather than purchasing farmers, substantially placing the market power in the hands of seed companies (offer) rather than farmers (demand) (Bishaw et al., 2019).
- 7) Some shortcomings in terms of variety maintenance and early seed multiplication by INRA, which made less appealing for private companies to purchase them (Yigezu et al., forthcoming).

### The situation in 2020:

These publications and the organization of several high-level discussions around them are believed to have helped shift the political vision, and several major changes were introduced as part of the Green

Morocco plan to revamp the national seed business, some of which resulted in positive changes, others still require revisiting. Here below is a short summary of the changes.

- 1) The establishment of a “freedom to act” in the seed business, resulted in the privatization of SONACOS and the creation of over 300 new seed enterprises with more regional focuses. A substantial monopoly still exists in terms of shops and capacities, but a positive trend of reduction is visible.
  - a. A shift in certified seed sales to favor NON expired PVP top European varieties, released in Europe in the last decade occupy now >71% of the Moroccan market shares
  - b. INRA-CGIAR derived varieties (mostly pre-1990) shifted from 76% of the market shares in 2013 to 29% in 2019.
  - c. The project “Boudour” has invested some 45 Million USD to achieve certified seed sales to cover 60% for bread wheat area, 45% for durum wheat, and 20% for barley.
- 2) The catalogue variety testing has not been officially revised. However, some changes have been introduced in the VAT (Agronomic Value Test) assessment by accepting as released varieties that beat the check in at least one agro-ecology and match it as overall performances. Still, the release process and the secrecy of the data used to drive it are considered by many experts the most hindering aspect of the seed business in Morocco
- 3) The agricultural extension system (ONCA) remains as of today incapable of determining the best varieties to suggest to farmers because these data are not available to them. Several surveys with farmers have revealed that they do reach out each year to their local ONCA representative to receive advise on the varieties to purchase, and that the representatives tend to suggest the most recent ones from Europe.
- 4) The national breeders have revised their goals to better align with farmers needs and the concept of agro-ecology via contractual agreements with CGIAR (product Profiles) under the Excellence in Breeding initiative and as part of Morocco-CGIAR contribution.
- 5) INRA continues to demand fixed royalties for the right to use their varieties, but now SONACOS is no longer their only interlocutor, only the preferred one. In 2014 the 2007 released variety Faraj was sold to SONACOS, and after 6 years of multiplication is finally available for commercial sale (R1). In 2020, the intervention of high-level officials has promoted the sale to SONACOS of G1 seeds of 2 new varieties each of bread wheat, durum, and barley. Still, the current royalties’ practices is truly hindering the ability of INRA to re-gain market shares, and a through revision of this practice is currently ongoing.
- 6) Three major policy change enabled the uptake of certified seeds: *i.* provision of bread wheat harvest subsidies only to farmers that had a bank account open with Credit Agricole, and that could demonstrate purchasing certified seeds for that year; *ii.* Linkage of governmental “drought” insurance only to those farmers that had planted certified seeds; *iii.* Increase in the certified seed subsidies that seed companies receive and use to reduce the final sale price to farmers (from 50 to 65 MAD per quintal). This ultimately resulted in highly advantageous prices for certified seeds over “good” seeds:
  - a. bread wheat R1: 375DH/q, R2: 330 DH/q compared to “food seeds” at 280 DH/q; and “good seeds” at 300-310 DH/q
  - b. durum wheat R1: 400 DH/q; R2: 385 DH/q compared to “food seeds” at 350 DH/q, and “good seeds” at 380-390 DH/q

- c. barley R1: 295 DH/q, R2: 280 DH/q compared to “food seeds” at 260 DH/q, and “good seeds” at 270 DH/q
- 7) INRA royalty system promotes the sale of its varieties as little quantity of very expensive G1 seeds, rather than larger quantities of somewhat expensive G3. Also, ONSSA needs to investigate all production fields (G1>R1) in order to certify the harvest. As such, this system prevents INRA from “fast-track multiplication” of seeds pre-release (i.e. need for ONSA certification given only after a variety is released) and also it pushes against multiplication pre-sale. For instance, the variety Nachit was certified and multiplied to produce 1 ton of G3, but this seed was deemed to expensive by the purchasing companies and preferred instead to purchase G1 seeds of other varieties.
- a. In addition, European seed companies do not impose the “purchase” of royalties for the right to use their varieties, but rather sell annually their G4 seeds, which favor their rapid commercialization
  - b. Finally, a somewhat unfair policy provides to certified seed multipliers subsidies equal to 400-500 MAD per quintal for EU imported varieties and only 180-200 MAD per quintal for Moroccan varieties.

### Suggested interventions for further improvement of the Moroccan seed system:

1. Modernizing the variety release system:
  - a. Increase number of testing stations: currently 7-8 stations are used each year to select varieties to be cultivated over 4.5 M ha. As a comparison, a country like Italy (substantially the same surface) utilizes 37 stations. Morocco has 12 regions, and each should be represented at least twice in the catalogue to be able to identify varieties adapted to each. In addition, many stations cannot guarantee sufficient quality of data collected, and hence these should be provided with improved machineries and training.
  - b. Clear variety terms: the current release process relies mostly on yield performances in comparison to old checks. However, several traits of great importance to Moroccan farmers (such as straw yield, resistance to Hessian fly, earliness, and grain size) are not included in the release decision. Similarly, the requirements of food transformers (color, gluten, protein) are also not considered. The zonal distinction of Morocco is also thus far ignored, and the same varieties are released for the snow covered mountains and the hot irrigated deserts. Hence, clear “release charts” should be agreed upon for each zone with the different value chain operators, including the definition of the best check to beat. Then ensure proper testing as part of the national catalogue and the use of these data to guide the release.
  - c. Transparency: the data collected by the national catalogue represent an ideal opportunity to help guide ONCA and farmers to cultivate the best possible variety. In turn this would favor a more competitive market and faster uptake of novelty. To achieve this it would be sufficient to make the catalogue data publicly available on the ONSSA web site, and task an ONCA representative to convert them into farmers bulletins easy to understand.
  - d. Homogeneity: the strict requirement of homogeneity is still the first cause for rejection. The current value is set at <0.06% of heterogeneity, which is clearly too strict in comparison with what used by other countries (1.2-2%) for release. This delays the variety submission by no less than 3 years since multiplication from an individual F10

spike is needed to match the needed level of homogeneity to reach the 50 Kg required for submission. A better approach would be to lower the requirements for homogeneity at the time of release but impose it instead at the time of  $G_1$  certification. This would allow breeders to utilize the 2 years of catalogue testing to produce the 1,000 spikes needed for  $G_1$  certification, starting from an individual  $F_{10}$  spike. An additional aspect could be the use of molecular markers to assess the homogeneity of varieties, which would be significantly cheaper and more reliable than conducting spike-to-row evaluations.

2. Building an INRA seed unit:

- a. Revise royalty's system: the promotion of national varieties is a better long-term strategy than the import from Europe. Still, it is evident that seed enterprises prefer to purchase at higher price the  $G_4$  seeds of European varieties than do the expensive purchase of the "right to use" of  $G_1$  seeds of INRA's ones, before their commercial value is truly demonstrated. As such, it would be best that INRA changes its contractual approach to start selling annually the  $G_4$  seeds of its varieties, the same way as for European ones. In order to achieve that, INRA will need to re-establish its seed unit to effectively produce the needed  $G_4$  seeds.
- b. In addition, INRA is a public institution with the goal of bettering Moroccan agriculture. As such, it should be trusted to develop new agreements with ONSSA to facilitate pre-release certification of  $G_1 > G_4$  seeds. This in turn would level the competition with European varieties, which are allowed direct import of  $G_4$  seeds at the time of release, implicitly trusting the European system to certify these seeds.

3. Certified seeds subsidies:

- a. The current rates of subsidies seem to have truly incentivized the market. So the hope is that these values can be maintained in the long term.
- c. However, the promotion of national varieties should be seen as a pride and competitive advantage for Morocco. Hence, Finally, the certified seed multipliers subsidies should be raised to 400-500 MAD per quintal for national varieties registered in the catalogue less than 5-10 years prior, and just 180-200 MAD per quintal for European imported ones.


## Supporting discussions and data for the changes discussed in the text above:

Establishment of “freedom to act” in the seed business, with privatization of SONACOS which prompted the creation of over 300 new seed enterprises with more regional focuses

(<http://www.onssa.gov.ma/images/liste-des-etablisements-agrees-pour-commercialisation-des-semences-plants-aout-2020-dcsp.pdf>)

- 1) This can be seen in **Fig 1** with several new private entities submitting varieties for release consideration (i.e. Benchaib Semences, Marosem SARL, Florimond Desprez Maghreb, Aphysem, and Pionagri) in addition to SONACOS and INRA;

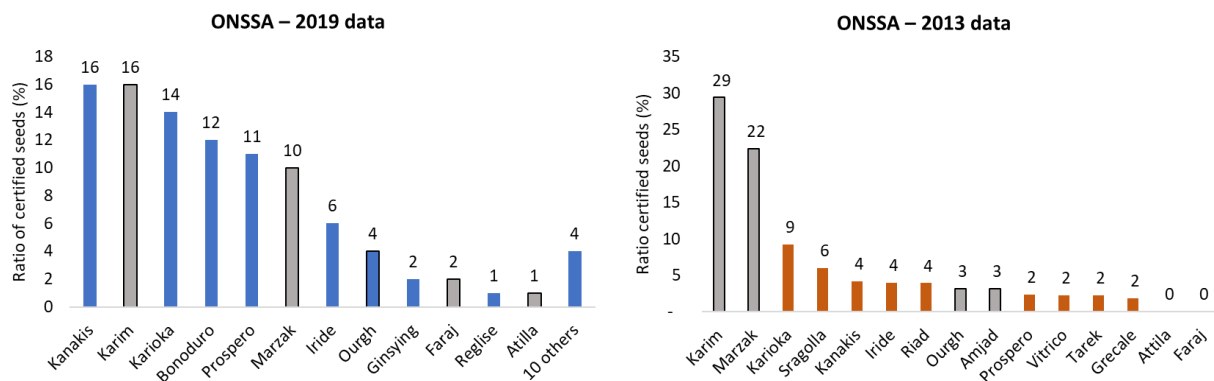
DECISIONS DES MEMBRES DE LA SECTION DES CEREALES A PAILLES  
ESSAIS VISITES LE 19 MARS 2020



ES	varietes	serie	representant	obteneur	DECISIONS
BD			BENCHAIB SEMENCES	JLIBEN CONSULTING	A Eliminer
BD			BENCHAIB SEMENCES	SEMILLAS BATTLE	A Eliminer
BD			INRA MAROC	INRA MAROC	A Eliminer
BD			MAROSEM SARL	TARIM ISLETMELERI GENEL TURQUIE	A Eliminer
BD			MAROSEM SARL	TARIM ISLETMELERI GENEL TURQUIE	A Eliminer
BD			MAROSEM SARL	TARIM ISLETMELERI GENEL TURQUIE	A Eliminer
BD			PIONAGRI	APSOVSEMENTI SPA ITALY	A Eliminer
BD			SONACOS	SEMILLAS BATTLE	A Eliminer
BD			SONACOS	SEMILLAS BATTLE	A Eliminer
BD			APHYSEM	APSOVSEMENTI SPA ITALY	A Reconduire
BD			APHYSEM	APSOVSEMENTI SPA ITALY	A Reconduire
BD			APHYSEM	SIS SOCIETA ITALIANA SEMENTI - ITALY	A Reconduire
BD			BENCHAIB SEMENCES	JLIBEN CONSULTING	A Reconduire
BD			BENCHAIB SEMENCES	JLIBEN CONSULTING	A Reconduire
BD			BENCHAIB SEMENCES	SEMILLAS BATTLE	A Reconduire
BD			FLORIMOND DESPREZ MAGHREB	FLORIMOND DESPREZ France	A Retenir
BD			FLORIMOND DESPREZ MAGHREB	FLORIMOND DESPREZ France	A Reconduire
BD			INRA MAROC	INRA MAROC	A Reconduire
BD			PIONAGRI	APSOVSEMENTI SPA ITALY	A Retenir
BD			SONACOS	LIMAGRAIN EUROPE	A Retenir

**Fig 1.** Results of 2018-19 durum wheat catalogue results

2. A shift in certified seed sales to favor European non expired PVP. This can be seen in **Fig 2** with INRA-CGIAR derived varieties shifting from 57% of the market shares in 2013 to 29% in 2019, with the additional point that 3% of these are from post 2007 released varieties (Faraj and Attila). In addition, a field survey conducted in 2018-19 by the national milling association (FNM: <https://www.onicl.org.ma/portail/sites/default/files/FichierPage/RapportQualit%C3%A9R2019-FIAC.pdf>) confirmed that the prevailing varieties in farmers’ fields in order of their importance were: Kanakis, Karim, Carioca, and Boniduro, confirming that the certified seed sales values are matched by the actual adoptions.
  - a) It also necessary to note that the European varieties promoted are no longer expired PVP, but rather top varieties. For instance, Iride (by Syngenta) was the second most cultivated variety in Italy in 2018 and it now occupies 6% of the seed production area of Morocco. Kanakis (RAGT), which was the best advised varieties for South of Italy in 2017, and it is now the main one in Morocco. Boniduro (Semillas Battle) was the top varieties for Andalucia in Spain in 2019 and it occupies now 12% of the seed sales. Only Karioka and Prospero are old varieties that are substantially disappearing from European farmers fields.



**Fig 2.** Certified seed sales for durum wheat in 2019 and 2013. The grey bars represent INRA-CGIAR varieties, while the colored bars are European varieties.

In addition, **Fig 1** shows the new list of presented varieties for release in 2019, and it includes (hidden for privacy reason) several varieties registered in Europe less than 5 years ago.

**Hence, with these data in hand, the new question becomes: what has changed to promote so much more competition in the wheat sector and why so many new private entities have entered this space?**

The first aspect is the size of the certified seeds sales of Morocco that has attracted a lot of national and international investors. The Moroccan project “Boudour” under the Green Morocco Plan has pushed to achieve 60% of certified seed sales for common wheat by 2020. It invested 45 Million USD annually to produce 2 million quintals of R1 and R2 seeds, enough for planting approx. 2 million ha or 37% of total area under all cereals each year, and allow the planting of “good” saved seeds the following year on almost the whole surface. That is a huge market opportunity, approximately double than what it was in 2013.

The “Boudour” report stated that this system had pushed in 2019 certified seed sales to reach 60% for bread wheat area, 45% for durum wheat, and 20% for barley, and that it had a plan to further strengthen it in 2020 to achieve 60% BW, 55% DW, and 40% barley.

A major policy change was to target farmers instead of seed companies with the seed subsidies. This made it possible to link the provision of subsidies to the purchase of certified seeds. The Green Morocco plan has pushed farmers to open bank accounts with Credit Agricole. Under these accounts they receive subsidies for all the aspects of the crop, including insurance, and certified seed sales. For bread wheat alone farmers also receive a direct subsidy for the harvest. However, they do receive subsidies for the purchase of certified seeds and receive “drought insurance” only if they plant certified seeds.

Interestingly, the subsidies provided for purchasing certified seeds have been revised to be even higher compared to what originally set by the Green Morocco Plan back in 2014 (**Fig 3**).

Campagne agricole	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Blé tendre	50	50	55	55	60
Blé dur	50	50	50	50	50
Orge	50	50	50	50	50

CAMPAGNE AGRICOLE	2018-2019	2019-2020
Blé tendre	65	65
Blé dur	60	60
Orge	60	60

**Fig 3.** Extract from ADA subsidies for certified seed sales in Morocco, with above the original plan as set in 2014, and below the changes made in 2018 to raise the values.

This ultimately resulted in highly advantageous prices for certified seeds:

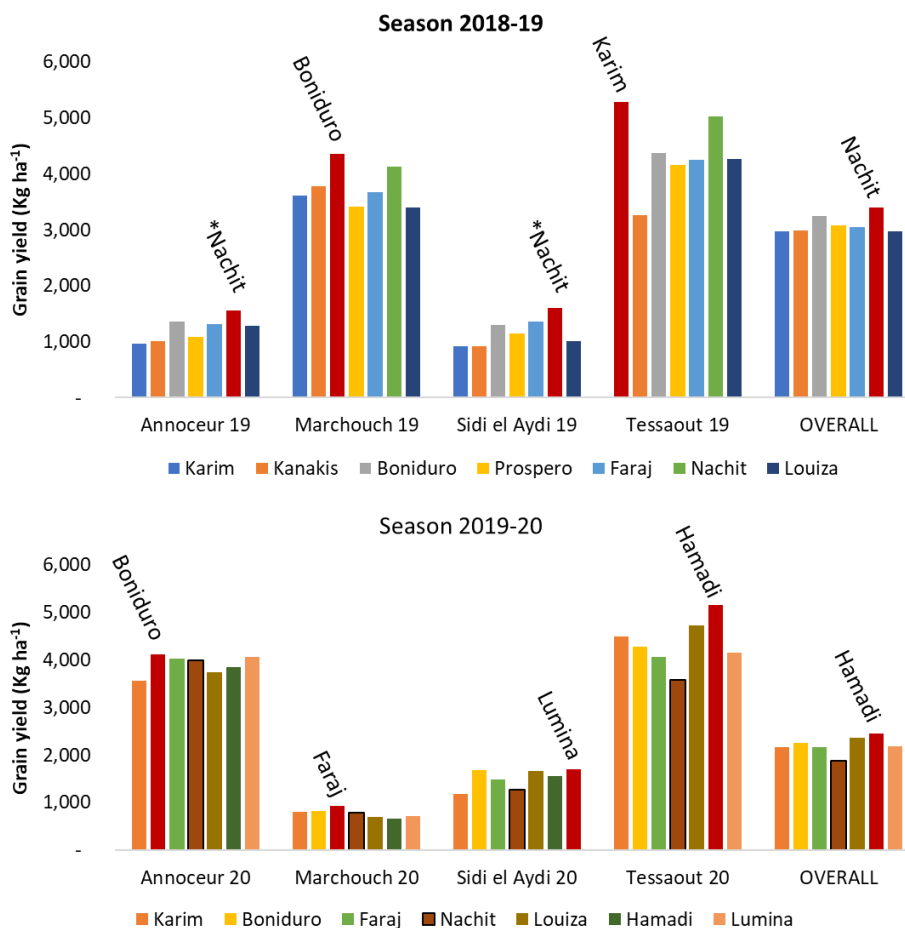
- bread wheat R1: 375DH/q, R2: 330 DH/q compared to “food seeds” at 280 DH/q; and “good seeds” at 300-310 DH/q
- durum wheat R1: 400 DH/q; R2: 385 DH/q compared to “food seeds” at 350 DH/q, and “good seeds” at 380-390 DH/q
- barley R1: 295 DH/q, R2: 280 DH/q compared to “food seeds” at 260 DH/q, and “good seeds” at 270 DH/q

Hence farmers only have to pay 2-4 USD more per ha to cultivate certified seeds, while gaining crop insurance and other benefits.

***Now that the market has increased in size and the competition has become fiercer, why are INRA varieties losing market shares?***

Several major factors are impeding the uptake of INRA-CGIAR varieties:

1. The release process has been informally revised to help the release of varieties for specific agro-ecologies (Agronomic Value Test - VAT). The release committee now accepts to register any varieties that beats the commercial check (still using Karim for durum and Amria for bread wheat) at one station by 5% or more, and that matches the check as average overall. An example of results of various released varieties tested by ICARDA across four locations in season 2018-19 and 2019-20 is presented in **Fig 4**. It is possible to notice how the 2017 released varieties Nachit performs very poorly under the irrigate conditions of Tessaout, but it was nevertheless released. Imported European varieties do not even need to achieve these VAT results as the European registration is sufficient to pass the VAT test (i.e. see poor performances of Prospero).



**Fig 4.** Yield performances of commercially available durum wheat varieties across locations and years.

One additional comment concerning the VAT test is that the station used are typically seven (Marchouch, Annoceur, Sidi el Aydi, Tessaout, Loukos, Jemaa Shaim, and Douyet) which represent somewhat the major agro-ecologies of Morocco. However, a comparison with Italy, which cultivates comparable surfaces of cereals, shows that in Italy, 32 stations are used, then divided into 4 major agro-ecologies. In addition, Sidi el Aydi and Jemaa Shaim station often suffers from poor performances due to drought and are hence frequently removed from the analysis. Hence, there is a clear shortcoming of Morocco in terms of number of stations used for a data-driven release process, but there is also an issue of primarily promoting varieties that adapt to the high input locations, more likely to be retained in the data analysis process.

- Another shortfall of the release process remains the need of high purity. As it can be seen from **Fig 5** the ONSSA requested conditions for submissions remain 200 spikes and 50 Kg of certified seeds (98.5% pure: [http://www.onssa.gov.ma/images/reglementation/reglementation-sectorielle/vegetaux-et-produits-dorigine-vegetaux/semences-et-plants/Production\\_et\\_commercialisation\\_des\\_SP/ARR.2197-13.FR.pdf](http://www.onssa.gov.ma/images/reglementation/reglementation-sectorielle/vegetaux-et-produits-dorigine-vegetaux/semences-et-plants/Production_et_commercialisation_des_SP/ARR.2197-13.FR.pdf) ). The test of 200 spikes planted in short rows need to show in year one maximum 2 spikes differing form the others (<1%) in order to pass the DHS. This remains the major issue of INRA presented varieties, with over 60% rejection rate due to scarce purity of seeds (see **Fig 1**). Obviously, released varieties



coming from Europe have already achieved the purity level needed and hence more easily pass the first year DHS test.

Royaume du Maroc

Office National de Sécurité Sanitaire  
des Produits Alimentaires



المملكة المغربية  
المكتب الوطني للسلامة الصحية  
للمنتجات الغذائية

ESPECE	Date limite de réception des demandes et des échantillons	Besoin en semences pour une année d'expérimentation	
		Liste A *	Liste B *
BLE DUR BLE TENDRE ORGE AVOINE TIRITICALE SEIGLE	15 AOÛT	- 200 épis ou panicules non battus - 50 kg de semences certifiées	- 200 épis ou panicules non battus - 5 kg de semences certifiées

**Fig 5.** ONSSA requirements for submission of cereal varieties to the catalogue trials.

3. Yet, the biggest issue overall is the secrecy maintained by ONSSA on the national catalogue results. In order for farmers to know which varieties to purchase, they would need to receive a bulletin from ONCA to indicate the performance of varieties in the different agro-ecologies. The national catalogue data are typically used in Europe to provide these inputs. An independent scientific institution analyses the catalogue data and make the results freely available online for experts to use them. In addition, they develop a simplified bulletin for each agro-ecology to help farmers decide which variety to purchase. Hence, it is essential that ONSSA is requested as soon as possible to provide these data freely on its web site, so that INRA could analyze them and provide a bulletin to ONCAA for guiding the farmers.

Nevertheless, INRA has continued to release CG-derived varieties like Nachit, Hamadi and Itri in 2017 for durum, but also varieties of bread wheat and barley. The performances of these new varieties appear as superior to the other commercially available ones (see **Fig 4**) and could then be easily promoted for commercial production. In fact, Nachit has also been extensively demonstrated on farm by several ICARDA-led projects that it has earned farmers' great appreciation and strong yield superiority under dry conditions.

1. Hence, there might be an issue on royalty payments for the sale of varieties. Since the privatization of SONACOS, INRA is no longer obliged to sell its varieties to it, even though it remains the preferred purchaser. After the intervention of INRA's DG and some high-level discussions, in 2020, two barley, two durum, and two registered varieties of bread wheat from INRA were sold to SONACOS (**Table 1**).

**Table 1** – INRA varieties sold to SONACOS in 2020

Crop	Variety	Year of Release
Barley	Assiya (ICARDA)	2017

	Khната (ICARDA)	2016
Durum wheat	Itri	2016
	Hammadi (ICARDA cross)	2017
Bread wheat	Snina (ICARDA)	2017
	Malika (ICARDA)	2016

Their G1 certification process can now be started to become commercially available to farmers as R1 by 2026-27 season. Interestingly, this is the same situation witnessed for the variety Faraj released in 2007, sold to SONACOS in 2013, and that has in 2020 reached 2% of the multiplication surface. It took INRA 7 years to certify G1>G3, then pass to SONACOS for G4>R1 production. Surprisingly, the variety Nachit, also released by INRA in 2017, which had instead been “fast track multiplied” with 1 ton of ONSSA certified G3 seeds available was not sold by INRA to SONACOS. This is due to the special agreements for the payments of royalties that INRA has been following. Each year the new varieties are first presented to SONACOS and then open to other bidders. Each entity sends a closed envelope offer to INRA for purchasing the rights to commercialize a given variety. The price of the variety is then calculated as “value per Kg” multiplied by “Kg”. G1 seeds cost more than G3 for instance but are in much lower quantities. So, for instance 10 Kg of G1 could cost 10,000 USD to purchase at 1,000 USD per Kg, while 1,000 Kg of G3 would cost a total of 100,000 USD, but only a unit value of 100 USD per Kg. For that reason, it is normally more convenient for SONACOS to purchase varieties as G0 or G1 and wait more years for the multiplications, than invest more into higher Gs. This is therefore promoting a delay in seed multiplications of released varieties, making them less competitive, and explain at least in part the loss of market shares, even though Faraj was demonstrated to be superior to Kanakis.

2. In addition, European seed companies do not impose the “purchase” of royalties for the right to use their varieties. Rather they stipulate contractual agreements for the annual provision of G4 seeds at prices far superior to their actual market value, so to recover their IPs. This strategy is much more flexible and allows Moroccan seed enterprises to delay payments until commercial production has begun, and hence finds far greater appreciation.
3. Still, the biggest push toward the commercialization of European varieties comes from the Green Morocco Plan. Certified seed multipliers receive subsidies to keep the price of their certified seeds low. As of 2019, these subsidies equal to 400-500 MAD per quintal for EU imported varieties and 180-200 MAD per quintal for Moroccan varieties. This means that a multiplier makes double the income when multiplying foreign varieties.

**Table S1 – Summary of changes between 2013 and 2019**

Category of change	Variables	Condition in 2013	Condition in 2020	Remark/source
Institutional	Number of private seed companies	5	>300	
	Number of bread wheat varieties for which certified seed was sold	25	20	
	Number of durum wheat varieties for which certified seed was sold	10	12	
	Quantity of certified seed of bread wheat varieties sold (million quintals)	0.9709	1.8	
	Quantity of certified seed of durum wheat varieties sold (million quintals)	0.0001	0.6	
	Quantity of certified seed sold (million quintals)	0.971	2.4	
	Share of certified seed in total seed use (%)	22%	60% BW, 45% DW	
	Share of private sector in total certified seed sales (%)	19.1%		
	Share of SONACOS in total certified seed sales (%)	80.9%		
	Share of INRA-CG varieties in total certified seed sales (%)	45.62%	26% BW, 29% DW	
	Share of non-INRA-CG varieties in total certified seed sales (%)	54.38%	71-74%	
Varietal use by farmers	Area under INRA-CG varieties (% of total wheat area)	79.2%	26% BW, 29% DW	
	Adoption of less than 20 years old varieties (%)	42%	80% BW, 63% DW	
Policy	Price of bread wheat grain (for food, for seed) MAD/kg	(3.25, 3.74)	(2.80,3.05)	
	Price of certified bread wheat seed (R1, R2) MAD/kg	(?,4.95)	(3.75,3.30)	
	Price of durum wheat grain (for food, for seed) MAD/kg	(,)	(3.50,3.85)	
	Price of certified durum wheat seed (R1, R2) MAD/kg	(,)	(4.00,3.85)	
	Government subsidy for seed of bread wheat MAD/kg	0.17	0.65	
	Government subsidy for seed of durum wheat MAD/kg	0.18	0.60	
	Extension service delivery mainly provided by	MoA	ONCA	
	Performance of extension service delivery	Poor	Unable	Need ONSSA data from catalogue to guide decisions

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