

NEW INFORMATION to help refine varietal choice



Plant breeders aim to guide new demand towards more legumes.

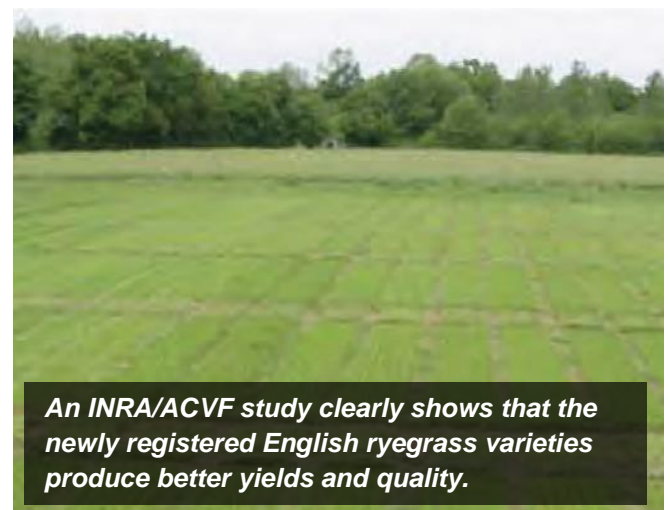
New registrations, new data and implementation of the Herbe-Book decision support tool : New solutions have become available to refine the choice of varieties and tailor it to each farm.

To create or rejuvenate a grass field, farmers can choose from 600 varieties covering around fifteen species of grasses and legumes. This current plethora is the result of very active research work. Plant breeders are aiming to guide new demand towards more legumes, as well as more grasses with short cycles or better suited to haymaking, baling or silage making. This greater choice also results in a wide range of more productive varieties, more spread out in terms of production, with greater resistance to diseases, and able to cope with different soil and weather conditions.

Gathering knowledge

Choosing one or more species (to sow as a mixture) is still the first step in the process of creating a new grass field. Then the farmer must decide the main purpose of his/her grass field (pasture, harvesting, or a mixture of the two), its expected life span and how best to adapt it to the soil. Particular care must be taken when choosing species for dry hydromorphic soils with a definite pattern of wet winters and dry summers, as well as for acid soils.

Once he/she has chosen the species, a variety must then be selected. Results from the CTPS trials (1) are used for varietal registration purposes, but this corpus of information is not otherwise easily accessible. That is the reason why, each year, GEVES (2) recalculates all the scores based on all trials data.



An INRA/ACVF study clearly shows that the newly registered English ryegrass varieties produce better yields and quality.

This has helped to produce comparison tables for all the varieties registered since 2000 for the fourteen main forage species. Those tables form the database used for the Herbe-Book tool, which is available online and has been disseminated collectively by AFPP (3), ARVALIS - Institut du Végétal and GNIS (4) since 2011, via the herbe-book.org website. It has become a reference tool. The

+ 0.3t DM/ha every 10 years through English ryegrass varietal selection.

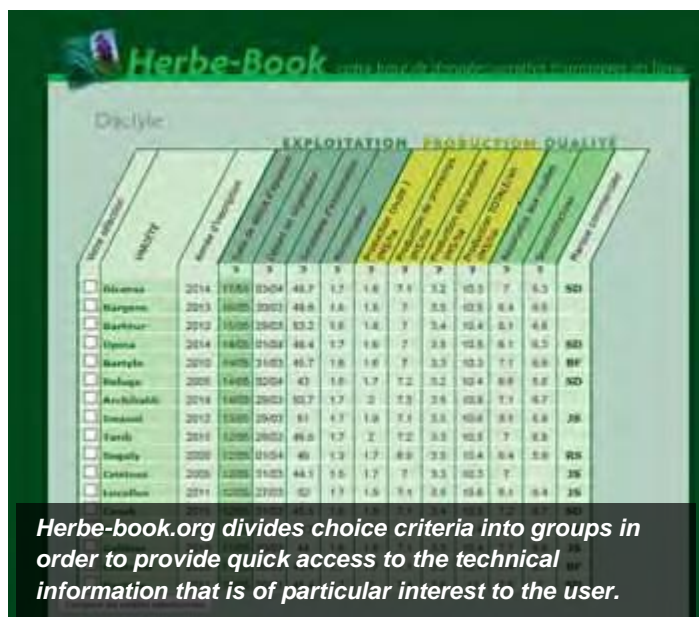
A growing market

The forage grass seed market saw significant growth over the 2014-2015 season. This is partly due to a favourable context, with a large number of grass fields needing rejuvenated. As for protein content, the need to reduce feed costs and the growing size of herds that see the rise of trough feeding, explain the renewed, and probably long-term importance of this criterion.

number of logins to connect to Herbe-Book increased steadily, to reach 36,600 in the 12 months between March 2015 and March 2016.

A new version is launched online at the beginning of each year, giving the overall scores of all varieties, including the newly registered ones. Annual updates drop varieties that have been deregistered during the year. Herbe-Book currently describes 340 varieties registered since 2000, which represents on average 80% of varieties registered in France. This is a clear reflection of the very significant ongoing selection work, with large numbers of registration applications from new varieties. This proportion varies depending on the species, from 52% for white clover to 93% for English ryegrass. To help farmers make a choice, the website recaps the main characteristics of each species and the criteria to use to choose a variety. A different set of criteria applies to each species. For example, the main one for ryegrass is ploidy. For English ryegrass, ear emergence earliness comes second, while for Italian ryegrass the second criterion is resistance to rust.

Herbe-Book divides choice criteria into three main categories: farm type, production and quality (various types of resistance). To make an informed choice, the tool suggests the user should select one or two criteria at a time. Through successive choices, this will quickly lead him or her to the few varieties that match his/her requirements. Each criterion is defined and explained in an info-bubble that is easy to display. A summary sheet is available for each variety, with all the information collected by GEVES (notes, official data, breeder's name, etc.). The commercial name is indicated in the last column of the comparison table.



Herbe-book.org divides choice criteria into groups in order to provide quick access to the technical information that is of particular interest to the user.

(1) CTPS: Comité Technique Permanent de la Sélection

(2) GEVES: Groupe d'Etude et de contrôle des Variétés et des Semences

(3) AFFF: Association Française pour la Production Fourragère

(4) GNIS: Groupement National Interprofessionnel des Semences

(5) ACVF: Association des Créateurs de Variétés Fourragères

« Analyses show an improvement in forage quality, including higher soluble sugar content, and less but more digestible fibre. »

Utilising genetic progress

Progress is more limited and more difficult to measure for forage grass varieties than for arable crop varieties. This is due first of all to the absence of a post-registration trial network. The second reason is that forage production is obtained over several seasons. Varietal progress is therefore complicated and expensive to measure. Breeders nevertheless benefit from substantial advances in selection, as shown in the 2006-2009 ACVF (5)-INRA study, which involved multisite English ryegrass trials. The aim of the study was to overcome the problems linked to the evaluation of genetic progress for forage grasses. The agronomic performance of a panel of both old and new varieties was evaluated according to three different focusses: forage value (4 trial sites), isolated plants (2 sites) and seed production (2 sites). The panel included varieties officially registered in some European countries between 1965 and 2004. They were chosen among those holding the largest market share for each decade: 18 forage varieties, 5 mixed use varieties, and 7 European ecotypes (representing the diversity that existed before the creation of varieties). As a result, very substantial genetic progress was made, with a 0.3t DM/ha increase (tonne of dry matter per hectare) every 10 years. Half of this increase is attributable to autumn production. Other substantial gains were noted in terms of longevity (+0.32 points every 10 years), resistance to rusts (+0.66 points every 10 years) and remontant characteristics (-0.36 points every 10 years); they are indicative of the progress made. The nutritional value is not a criterion directly taken into account for selection purposes. Nevertheless, chemical composition analysis clearly shows better forage quality, including higher soluble sugar content, and less but more digestible fibre. Conversely, the total nitrogen content has decreased, being diluted in the overall yield. Seed yield remains comparable between old and new varieties.

It is reasonable to assume that the level of genetic progress measured by the ACVF-INRA study should continue. Similar progress is likely to be noted for the species that were not part of the study, such as orchard grass, tall fescue and Italian ryegrass.

Better quality

Since that study, CTPS has integrated quality criteria into the registration regulations applicable to the main forage grasses (orchard grass, tall fescue, meadow fescue, English ryegrass, hybrid ryegrass and permanent Italian ryegrass). This has been in place since 2013. The chosen quality criteria are total nitrogen content, soluble sugar content and ADF content (acid detergent fibre, insoluble fibre residue in the acid detergent, i.e. lignin and cellulose). In addition, ADF content has been one of the registration criteria for lucerne since 2007. GEVES will therefore be able to supply FU (feed unit) figures, as well as total nitrogen and soluble sugar contents to help update the Herbe-Book in 2016. Registration regulations guide selection work. In a few years' time, the integration of quality criteria will result in better varieties without compromising the advances made with regard to other criteria.

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French registration requirements are such that only good or very good varieties are registered, without however losing the differences between the assessment criteria.

Source: www.herbe-book.org