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Editor's Note

Welcome to Newsletter No. 62. This is our first Newsletter with our new design and IHSG logo! In this edition we look at herbage seed production research in East Africa and Thailand supporting grassland farmers in many developing countries. The East Africa program is based with ILRI (International Livestock Research Institute) in Kenya building on work started in Ethiopia. In Thailand we learn about a model for village-based seed production that provides high-quality seed not only to Thai farmers but to more than 20 countries in tropical regions. You will find insights into integrated weed management at the farm scale, training seed growers and combine operators to reduce grass seed losses at harvest, and updates from Tasmanian insect pollination research and Norwegian seed production research.

The deaths of long-time IHSG members Murray Kelly (New Zealand) and Carlos Rossi (Uruguay), friends to many of us, are recognized in obituaries penned by their colleagues. Both gentlemen will be deeply missed by their family, friends, and IHSG community.

For our northern hemisphere colleagues as you complete spring management, we wish you a successful harvest.

If you have a story or project update to include in a future Newsletter Edition, fill out our Form or email us at:

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Table of Contents	

IHSG President's Column

The IHSG Board met on 22 April 2026 to review current activities and set direction for several important areas as we move toward the next conference cycle.

A key focus of the meeting was financial oversight and ensuring the long-term sustainability of the IHSG. While overall returns on accounts have softened slightly in recent months, the IHSG remains in a sound position, however, interest on current term deposits is the only annual income, which requires careful management of costs, including website development and expenses.

We also gave considerable attention to the financial framework for IHSG meetings. Following discussion, the Board agreed to formalise expectations around conference returns. We will be able to provide a clearer and more sustainable funding model to support future conferences and IHSG operations.

Further work is underway to develop a formal Local Arrangements Committee (LAC) policy, which will define expectations more clearly ahead of upcoming meetings.

Progress toward the 2027 Denmark conference continues well. The venue has been secured, with initial planning around field trips, technical visits, and accessibility. Early indications are very positive, with an attractive programme taking shape and good logistical planning underway. Abstract submission timelines and registration processes are still being refined, with further detail expected in the coming months.

Planning for the Uruguay meeting will continue at the July Board meeting, alongside further discussion on IHSG structure and future publication arrangements.

The Board also reviewed progress on the IHSG branding update, with a revised logo you can see in this edition of the Newsletter. This will support improved communication and visibility, including upcoming newsletters and conference promotion.

More broadly, the Board continues to prioritise strengthening governance, improving consistency across conferences, and ensuring that IHSG remains financially and operationally robust. Establishing clearer guidelines for meetings, publications, and financial returns is an important step in supporting the long-term success of the IHSG while maintaining flexibility to include a diverse range of host countries and participants.

I would like to acknowledge the contributions of Board members and meeting organisers, whose efforts ensure that IHSG continues to deliver high-quality scientific exchange and strong international engagement.

We look forward to providing further updates following the July Board meeting.

Dr. Richard Chynoweth

President, International Herbage Seed Group

Introducing the New IHSG Logo

The IHSG Board is excited to introduce to you our new logo and Newsletter design! The new logo encapsulates both grass seed and legume production and provides a sleek, modern take on our organization's name and abbreviation.

We will be rolling out our rebranding of the website and newsletter over the remainder of the year. Keep an eye out for social media accounts and other updates to our web presence!

The logo and rebrand was designed by Oregon State University Botany and Plant Pathology Ph.D. candidate Daniella Echeverria. Daniella started her professional career as a graphic designer and illustrator and continues that through now in her scientific career.

In her own words, "Since 2009, I have been crafting captivating logos and scientific illustrations. I bring a unique blend of creativity and scientific expertise to every project. Contact me for innovative graphic design solutions tailored to your needs that communicate complex ideas with precision and flair." If you want to work with Daniella on your next scientific illustration project, you can contact her at: echeverd@oregonstate.edu

or check out her website: https://delightsofdecay.github.io/

Strengthening Forage Seed Systems in Sub-Saharan Africa: Role of ILRI-Herbage Seed Unit

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Feed resource availability, both in terms of quantity and quality, remains one of the major

challenges for livestock productivity in Sub-Sharan African (SSA). Promoting sustainable, improved forage production and utilization is one way to address this situation. However, this is dependent on the availability of quality forage seed, functional forage systems and technical capacities.

Figure 1. Herbage seed unit seed production at Bishoftu, Ethiopia 2025.

To support the incorporation of improved forages and promote access to forage seeds into farming systems, International Livestock Research Institute (ILRI) Ethiopia established its Herbage Seed Unit (HSU) in 1989. The unit has been playing an important role as a source of quality forage seeds and a training hub for researchers and technicians working in different national institutes for decades. HSU operates in collaboration with the ILRI forage genebank to multiply forage seeds and provide starter seeds and technical training in all aspects of quality seed production. The unit multiplies and distributes selected commercial forage cultivars and 'best bet' accessions of herbaceous legumes, grasses and fodder trees, sourced from the genebank that are adapted to different agroecologies and production systems (Figure 1).

Over the past decade, the unit has distributed over 14 tonnes of forage seeds and more than two million cuttings/splits, mainly in Ethiopia (Figure 2). The major types of forage planting materials distributed include the grasses: Napier/Elephant grass, Urochloa, oats, and Desho; and herbaceous legumes and fodder trees: cowpea, lablab, vetch, and sesbania.

(Figure 2). Although the main impact has been in Ethiopia, forage seeds of improved cultivars and best bets have also recently been distributed to Kenya and Nigeria for further adaptation trials and seed multiplication to support the forage systems in the respective countries.

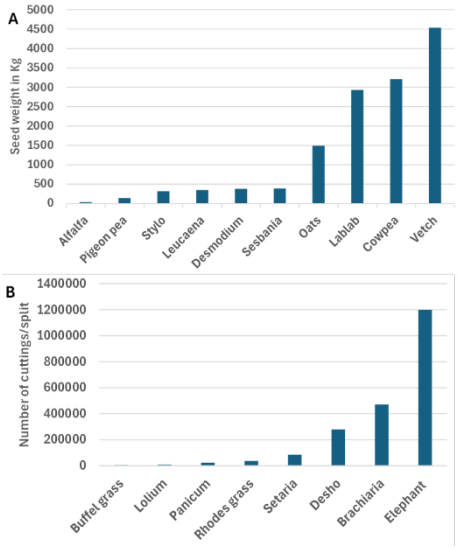

Figure 2. Distribution of planting material from 2016-2025 from different forage species A) quantity of seed in Kg B) Number of cutting/splits.

In addition, the unit has hosted different technical trainings for numerous researchers and forage seed growers, that focused on sustainable forage seed production systems and technologies via intensive theoretical and practical learning approaches (see: Abdena et al., 2023; Bezabih et al., 2025). Trainees gain experience on common forage types, characteristics, crop and field management, seed harvest and post-harvest seed management practices (Figure 3). These trainings have empowered entrepreneurs to transition in to seed businesses, leading to the establishment of private forage seed companies, particularly in Ethiopia, that address the growing demand for forage seeds and encourage private-sector involvement.

Figure 3. Practical demonstration on forage seed production to trainers in 2025.

As climate variability challenges traditional grazing and production of forages, the role of the Herbage Seed Unit is becoming more critical for resilient livestock systems in SSA.

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ILRI Herbage Seed Unit: https://www.ilri.org/herbage-seed-unit

Village based tropical grass and legume pasture seed production in Thailand

Michael Hare, Ubon Forage Seed. Co. Ltd., Thailand, michaelhareubon@gmail.com

Seed production of tropical grasses and legumes in Thailand is done by small-holder village farmers in northeast Thailand. Harvesting of these seed crops is entirely done by hand.

Up until the early 1970s very little attention had been given to pasture seed production in Thailand, with improved pastures planted vegetatively with cuttings of para grass (*Urochloa mutica*), common guinea grass (*Megathyrsus maximus*) and common napier grass (*Cenchrus purpureus*) (Hare, 1993). From 1972-1976, seed production studies were carried out at a Thailand government center and at Khon Kaen university on *Megathyrsus maximus*, buffel grass cultivars (*Cenchrus ciliaris*), Townsville stylo (*Stylosanthes humilis*), siratro (*Macroptilium atropurpureum*) and sabi grass (*Urochloa mosambicensis*).

Figure 1. Hand-knocking Mun River guinea grass seed into a basket.

The results of these seed production studies were used to undertake pasture improvement projects with the Thailand Department of Livestock Development from 1976 to the present day. In the early years of these projects, various methods of mechanized seed harvesting and village farmer hand harvesting were explored (Hare, 1993). After a few years, mechanized seed harvesting stopped and all seed production was hand

harvested, achieving higher quality seed. The main species currently harvested are Verano stylo (*S. hamata*), ruzi grass (*Urochloa ruziziensis*) and Purple guinea grass (*M. maximus*).

Figure 2. Sweeping Ubon stylo seeds from the ground.

In 1995, seed production research commenced at Ubon Ratchathani university in Thailand. The research led to village seed production of Ubon paspalum (*Paspalum atratum*), Mulato II hybrid brachiaria (*Urochloa ruziziensis* x *U. decumbens* x *U. brizantha*), Ubon stylo (*Stylosanthes guianensis* var. *guianensis*), Mombasa guinea grass (*M. maximus*) and Mun River guinea grass (*M. maximus*).

Michael Hare has been involved with all of the above seed programmes and projects since 1974. The government programmes sold their seeds only within Thailand and distributed free seeds. In 2009, Michael's university project (Ubon Forage Seeds), started to sell seeds overseas. The export market rapidly expanded and in 2016 Michael and his wife and family formed Ubon Forage Seeds seed company (https://ubonforageseeds.com/en/). Their seeds are now sold to over 20 overseas countries. All the seeds are hand-harvested by several hundred contract farmers in north-east Thailand and northern Laos (Hare 2014).

Figure 3. Cleaning Ubon stylo seeds in the field.

At anthesis, seed heads of the grasses are tied together and when the seeds mature, the ripe seeds are knocked into baskets (Figure 1). The seeds are then dried in the shade to about 12% seed moisture, cleaned by the farmers and then dried again to about 10% seed moisture. Ubon Forage Seeds gives each village a small electric-driven seed cleaner to facilitate seed cleaning. Ubon Forage Seeds buys the clean seeds with cash in each village and trucks the seeds back to Ubon Forage Seed store in Ubon Ratchathani, north-east Thailand. The seeds are then dried again to about 7-8% seed moisture, cleaned to 100% purity and then stored in a cool room (20^{0}C, RH less than 50%).

Ubon stylo seeds are swept from the ground. The seeds are allowed to mature in the seeds and at seed harvest in late January, farmers

use sticks to beat plants to dislodge any remaining seeds from the seed heads. The stylo vegetation is cut to ground level and removed. Fallen seeds are swept from the ground (Figure 2) and cleaned by farmers in the field (Figure 3). Ubon Forage Seeds buys the seeds in early March, and at the seed store, the seeds are acid-scarified with sulphuric acid to remove any soil and seed coats. This improves seed purity and overcomes hard-seed dormancy, thereby improving seed germination.

Village farmer seed production, which involves hundreds of farmers producing seed on small areas of land, is a difficult management operation. At times it becomes a social orientated enterprise that has to deal with many factors outside a normal business operation. There are difficulties with organizing production over large areas, maintaining high seed quality, famers not honoring contracts and selling to outside buyers (Hare, 2015). Ubon Forage Seeds was the first private seed company in Thailand to produce and sell pasture seeds. It is still the only seed company that exports pasture seeds.

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Whole-Farm Approach to Grass Weed Management

John Fairey, Germinal GB Ltd, United Kingdom, john.fairey@germinal.com

I was recently invited by Birte Boelt to speak at the annual Danish Plantekongressen conference, which is held in January every year and attracts upwards of 1500 people from all walks of the Danish agricultural sector. It was a very impressive gathering with more than 50 presentations over a busy day and a half.

Like every other Country involved with herbage seed production, the UK is constantly working to maintain the quality and purity of harvested seed, despite losing important chemistry year on year. Add to that the increase in herbicide resistance now being found, the latest here is glyphosate resistant Italian ryegrass, and the job gets tougher.

As a specialist agronomist, it is easy to take a blinkered view, just trying to work out the best solution for the grass seed crop being grown, but of course, many of the grass weed problems we have are because of what is being done or not done in other parts of the rotation and what the rotation is.

While The UK was in the EU and receiving money from the CAP (Common Agriculture Policy), farming practices drastically changed. Livestock disappeared; grass leys were not needed any more. Rotations became short and based on what the CAP

would pay the most for growing. Spring cropping diminished and many farms were growing winter wheat and Oil Seed Rape using low rates of a few specific active ingredients to control grass weeds. The legacy from this is why we are struggling to control grass weeds in arable crops today and the huge cost in trying to do so. Inevitably, the enlightened few who grow grass seed suffer as a result.

I was asked to talk about controlling black-grass (*Alopecurus myosuroides*) in ryegrass seed crops. We have always operated a small but effective trials programme, funded by a grower levy, and over the years, we have worked hard on improving efficacy of available products, using water conditioners, different timing of applications, etc. But reduced levels of active ingredients are difficult to compensate for.

Other species, like Bromes, Vulpia and increasing levels of Meadow grasses (*Poa trivialis* and *Poa annua*) are harder to deal with in many ways than Blackgrass, and have become a particular problem where reduced or zero tillage is being adopted.

Where possible, moving grass seed growers to undersowing in the spring is an effective way of reducing the grass weed burden in the seed crop. All the main weed grasses germinate in the autumn. It also opens the possibility of grazing the seed crop, once the cover crop, usually barley, is harvested. Sheep are a secret weapon for grass weed control and can and do reduce spending on herbicides if managed properly. It should be noted that most UK grass seed production is for 2 years, which offers more opportunities for grazing and/or chemical weed control.

One factor that applies to UK grass seed growers particularly, is the fact that they are paid for the outturn of their seed *after* cleaning, and the cost of that process is governed by an industry-wide agreement based on the purity of the seed. Several factors can affect intake purity, including combine set up, harvesting technique etc. but having a 'clean' crop is in everyone's interests to achieve high intake purities and reduce cleaning charges.

Because every single seed crop grown for Germinal is sampled post-harvest and analysed in our lab, I can conclusively say that our best growers practise some, or all of the management methods outlined above. ***They all have sheep on their farms; they plough and have long rotations***. They all spring undersow their herbage seed crops. Their purities off the combine are the highest and they generally have the highest clean seed yields and the lowest cleaning charges.

I remain convinced that there will be increased reliance on cultural methods, some long since forgotten, or just out of fashion (ploughing!) to alleviate a lot of problems we have; and rely on diminishing chemical options to control.

Tuning Combines to Cut Grass Seed Losses

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Seed cleaning plants are seeing higher losses, often 21-24% versus the sub-15% we used to expect. Much of it traces back to over-threshing at harvest.

Over the last couple of seasons, seed cleaning plants have been telling us the same story: field-dressed grass seed is arriving dirtier, and losses at the dressing plant are up. Where dressing losses used to sit under 15%, many plants now see 21-24%. That's real money left on the floor, and a clear sign that something has gone wrong at harvest.

Figure 1. Harvesting ryegrass that had been down too long due to wet conditions. Combine is New Holland CR9.90 on 3 Feb 2025. Diploid perennial ryegrass Cultivar 'Midway'.

We took a closer look. Six ryegrass waste samples from cleaning plants showed a lot of very short straw, less than 30 mm. That's a classic sign of over-threshing. When the threshing system runs too tight or too fast, straw gets chopped up, separation becomes harder, and more good seed ends up in the waste stream and more waste in the tank.

What FAR did

FAR has run hands-on grower combine harvester clinics across the 2024 and 2025 harvest seasons, backed by international experts on Claas, Case, New Holland, and John Deere machines. We walked through each combine "front to back," and then followed up in the paddock at harvest to measure the effect of any changes.

The clinics went back to basics:

- Productivity: Set the machine to keep the capacity without compromising the sample in the tank.
- Measurement: Change one thing, measure the result, then move to the next. You cannot manage what you do not measure. Guesswork out, data in.
- Practical tweaks: Concaves, rotor, sieves, and air adjusted methodically, not all at once.

Figure 2. Drop pan with offal and seed in it, assessed losses were: 200kg/ha, 8.3% loss on 2400kg/ha crop.

What changed in the paddock

Most growers started in the same spot: the threshing system. Opening the concave clearance generally made the machine less aggressive. The straw stayed longer, which made separation easier and kept the waste loading down. From there, growers fine-tuned airflow, sieve settings, and rotor speed, always with a quick check behind the machine and a look in the grain tank.

Figure 3. Bucket used to test the hectoliter weight and quality of the harvester grain tank sample. The bucket weighed 1.9kg (minimum weight for bucket according to John's label = minimum weight 1.9kg, good ryegrass weight 2.00kg and heavy 2.1kg)

Across 13 ryegrass growers we worked with, the measured harvest losses ranged from under 1% to over 9%. With a few careful adjustments, many shifted from the wrong end of that range to the right one. Data backed up what we were seeing: higher dressing losses were linked to lower grain-tank sample weights in diploid ryegrass. In other words, a poor setup at harvest shows up later as poorer returns after cleaning.

What improved

On farm:

- Lower losses: More seed in the bin, less on the ground.
- Cleaner samples: Less short straw and waste in the tank, which helps with cartage and storage too.
- Better efficiency: Smoother running, often with a lighter engine load and the potential for less fuel per hectare.
- Confidence: Growers felt comfortable moving beyond factory defaults and tuning to conditions.

At the dressing plant:

One Canterbury cleaning company and grower reported cocksfoot dressing losses on his own farm around 10%, down from a three-year average of 15-18%. That's a material lift through the whole system, and something others can work towards.

Quick wins to try this harvest

- Ease off the threshing: Open the concaves slightly so you're not grinding straw into short pieces, allowing easier separation of seed and waste, while not overloading the sieves.
- Change one thing at a time: After each tweak, check losses behind the machine and look at the tank sample.
- Balance air and sieves: Aim for a clean separation without blowing seed out the back. Be aware that in some makes of machine, adjusting the bottom sieve affects the airflow through the top sieves and the dynamics of the material on the top sieve.
- When assessing losses, conduct tests in the harvest mode you intend to operate in, since airflow varies between windrowing and spreading, and this will be reflected in the loss test.
- Recheck losses and sample quality when conditions or moisture change.
- Remember there is a sweet spot between speed (hectares per hour) and losses (kilos per hectare) out the back of the machine, and the implications that has in future crops.
- Weigh a small sample: Every so often, weigh a known volume from the tank. If the waste percentage climbs, that is your early warning.

The bottom line

Small-seeded crops do not give you much room for error. But the good news is that small, measured changes to the combine harvester setup can make a big difference. Open the concaves a touch. Watch your air and sieves. Measure every step. These steps should help you deliver a cleaner field-dressed sample, reduce cleaning losses, and move through harvest faster with fewer headaches.

Developing Flies as Managed Crop Pollinators

Raylea Rowbottom, seedPurity, Australia, rrowbottom@seedpurity.com

Over 80% of the crops around the globe, including many seed crops, are either dependent on or have their yield enhanced by insect pollination. The annual gross economic value of crops requiring pollination services exceeds AUD$9 billion in Australia and is estimated at USD$780 billion worldwide (Hafi *et al.*, 2012). Managed and feral European honeybees provide the vast majority of crop pollination services, with >90% of crops that depend on insect pollination serviced by honeybees. Over-reliance on a single species carries significant risk, particularly since honeybee populations are under increasing pressure from pests such as varroa mite and small hive beetle, as well as other threats including colony collapse disorder, climate change, pesticide usage and changing land use patterns. Additionally, the continuing expansion of pollination-dependent industries, combined with a decline in apiarist numbers and competing demands for honeybees for honey production and crop pollination are further exacerbating supply and demand challenges for crop pollination.

Flies are one of the most diverse animal groups in the world and the second most important pollinator group after bees. As managed pollinators, flies are likely to represent a good alternative or supplemental option to bees, because different species are present year-round and they frequently visit flowers to feed on nectar and/or pollen. Being hairy, they pick up and move pollen from a wide variety of flowers. In addition, some fly taxa can be easily and safely mass reared with reasonably low inputs.

Figure 1: Eristalis tenax from top left to right, larvae, pupae and adult foraging on sweet cherry blossom.

In Australia, a recently completed project "*Managing Flies for Crop Pollination*" (PH16002), funded by Hort Innovation Frontiers Fund with co-investment from the avocado and vegetable seed industries, investigated the potential of flies as managed crop pollinators. The project, led by the Western Australian Department of Primary Industries and Regional Development, in partnership with researcher providers seedPurity, University of New England and Western Sydney University, identified several Syrphid and Calliphorid fly species that are

effective pollinators of a range of crops including avocado, berries, sweet cherry and vegetable seeds. Importantly, the species identified are not considered pests and pose minimal health, safety and environmental risks. In particular, the widely distributed syrphid fly, *Eristalis tenax*, commonly known as a drone fly (Figure 1) was identified as a highly efficient pollinator across different crop types and production systems, with significant potential for development as a managed pollinator.

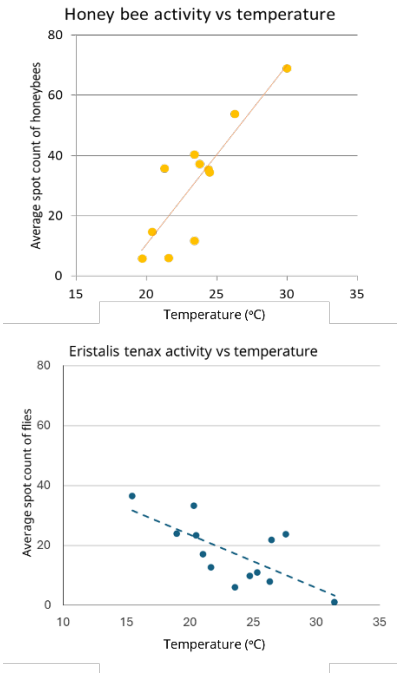

Figure 2: Relationships between foraging activity and air temperature for honeybees (top) and Eristalis tenax (bottom) demonstrate potential for complementary stocking of both species to extend the range of environmental conditions under which optimal crop pollination is achieved.

While *E. tenax* is equally as effective as honeybees as a solo pollinator in many crops, the research has shown that combining both species often has an additive effect, resulting in enhanced crop yields or fruit quality compared to those achieved with a single species alone. This complementary relationship arises from differences in foraging behaviour between the two species, particularly their temperature preferences and ranges. *Eristalis tenax* typically operates at lower temperatures than honeybees and over a shorter foraging distance (Figure 2). Notably, complementary stocking of *E. tenax* provides a clear advantage in early season crops where cool conditions are common during pollination, for crops that are less attractive to honeybees and for crops growing in landscapes with highly attractive alternative forage sources that may draw honeybees away from the target crop. Experimental open field releases of *E. tenax* over the last three seasons in Tasmania have shown significant promise with yields of hybrid *Brassica oleracea* seed crops (cabbage, cauliflower and broccoli) improved by 35% on average and sweet cherry yields increased by up to 60%. In cage trials in Western Australia and New South Wales, promising results have also been achieved in avocados and protected cropping systems, with the research progressing towards larger scale releases. Following these promising early results, vegetable seed industry stakeholders Bejo Australia and South Pacific Seeds and pollination service provider Tasmanian Pollination Services are currently working with researchers and Hort Innovation to scale *E. tenax* for commercial pollination in Australia (Figure 3).

The results of PH16002 have encouraged further investment in commercialisation of fly pollinators in Australia through a new Hort Innovation Frontiers funded project “Flies as Alternative Pollinators for Horticulture” (PH24002) led by seedPurity in partnership with DPIRD, the University of New England and Queensland University of Technology with co-investment from the avocado, apple

and pear and vegetable seed industries. This project will progress development of fly pollinators towards larger scale open releases, with a major focus on commercialisation of fly rearing. Another important focus of the project will be to develop best practice framework to identify and mitigate any risks associated with large-scale fly releases for crop pollination.

Figure 3: Top left to right; Eristalis tenax pollinating brassica crops and early mass rearing of E. tenax by South Pacific Seeds. Bottom left to right; commercial tunnel carrot stock-seed production using E. tenax as the sole pollinator.

This work to develop managed fly pollinators is of particular relevance to the seed industry. A significant component of the work to date has focused on vegetable seed crops and has demonstrated the value of flies as alternative or complementary managed pollinators in systems where pollination is a limiting factor, as is often the case for seed crops. The potential use of flies in herbage seed crops remains largely unexplored; however, wild syrphid flies are known to contribute to pollination of clover seed crops. As an extension of the current research, the Tasmanian Seed Industry Group is investigating opportunities to partner with AgriFutures Australia and seedPurity to assess *E. tenax* for pollination of white clover seed crops.

For more information, please follow the links below:

The current project summary - Hort Innovation | Flies as effective pollinators for horticulture (PH24002)

PH16002 final report – Managing flies for crop pollination (PH16002)

A review on the role of flies as crop pollinators – Cook et al. 2020.

Herbage seed production and research in Norway

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Acreage and species

Norwegian seed production provides seeds of climatically adapted varieties of grasses and clovers for conventional and organic farming. Since pastures and hay/silage fields contribute more than 70% of Norway's agricultural area, a safe supply of herbage seed is a prerequisite for forage-based farming across the country. Regarding herbage seed, Norway is nearly self-sufficient, with domestically produced seeds of most forage species with the main exceptions being white clover and ryegrass species. There is also an annual production of 50-100 tonnes of turfgrass seed consisting of winter-hardy Norwegian varieties of strong creeping red fescue, Chewings fescue and colonial bentgrass (browntop). This production only covers 10-15% of the annual

consumption and the remainder is imported. There is currently no domestic seed production of Kentucky bluegrass or perennial ryegrass for turf.

Table1: Certified seed production in Norway of various grass and clover species over the last 10 years (2016-2025).

Species	Number of varieties (2025)	Average seed production acreage (ha) in 2016-2025		
		Conventional	Organic	Total
Timothy (*Phleum pratense*)	5	1332	84	1416
Meadow fescue (*Festuca pratensis*)	2	371	52	423
Red clover (*Trifolium pratense*)	1	347	28	374
Red fescue (*Festuca rubra*)	5	185[1]		185[1]
Kentucky bluegrass (*Poa pratensis*)	1	164		164
Perennial ryegrass (*Lolium perenne*)	3	151	4	155
Browntop bent (*Agrostis capillaris*)	2	83		83
Smooth bromegrass (*Bromus inermis*)	1	66		66
Sheep's fescue (*Festuca ovina*)	1	48		48
White clover (*Trifolium repens*)	1	46		46
Reed canary grass (*Phalaris arundinacea*)	1	45		45
Orchard gras (*Dactylis glomerata*)	1	33		33
Tall fescue (*Schedonorus arundinacea*)	3	17		17
In total	**27**	**2889**	**167**	**3055**

[1]Split between an acreage of 121 ha and 64 ha of varieties of strong creeping red fescue (FR spp. Rubra) and Chewing's fescue (FR. ssp. commutata), respectively.

During the last ten years (2016-2025), the total herbage seed production area has ranged from 2,270 to 3,840 ha, with an average of 3,056 ha (Table 1). The dominant species are timothy, meadow fescue and red clover which have occupied 46, 14 and 12% of the total seed production area, respectively. All other species comprise 6% or less of the total area (Table 1). Tall fescue is the newest species in Norwegian seed production, with the first fields harvested in 2021. As shown in Table 1, approximately 5.5% of Norway's total seed production area is organic.

Today, more than 400 Norwegian farmers have seed production as a major part of their income, all producing certified seeds on contracts with one of the three Norwegian seed companies (Felleskjøpet Agri, Strand Unikorn, Felleskjøpet Rogaland Agder). The main production areas are along the southeast coast of Norway (58-60°N) and in counties surrounding the Oslo fjord (Østfold and Vestfold). Some seed production takes place further north, in Akershus and Innlandet counties (60-61°N), and a small amount of timothy seed crops are located as far north as Trøndelag (63-64°N). All seed growers are members of Norsk frøavlerlag, the national seed grower's organization, which is divided into 7 geographical sub-groups. For management of the organization, and for financial input to a seed production research fund, seed growers are obliged to pay 1.5% of their seed income to Norsk frøavlerlag. The research fund has been an important financial source new research projects over the last 20 years.

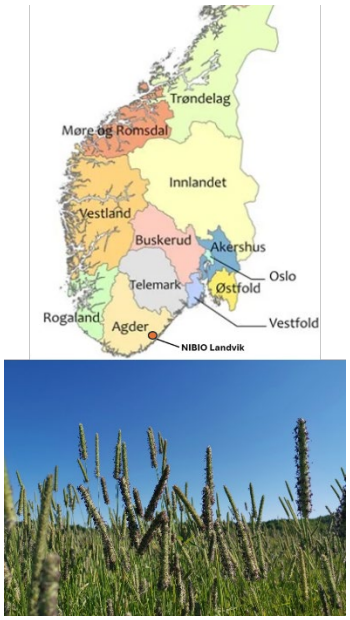

Figure 1: Top - Map of southern Norway, with various counties included. The main production areas are along the southeast coast. Bottom – Timothy grass.

Research activity / climatic conditions

NIBIO's Landvik research station, located in Grimstad (58.2 °N, Figure 1), has a long history of herbage seed production research, starting in the early 1950's focusing on peas, beans and various Brassica-species. In the early 1970's the focus shifted more towards

forage seed production research in grasses and clovers. Scientists leading the Norwegian seed production research are Trygve S. Aamlid (since 1986; also working with turfgrass research since 2003), Lars T. Havstad (since 1994) and the latest addition, Nicole Anderson, joining the NIBIO seed research team in 2024 (Figure 2).

Figure 2: Researchers at NIBIO Landvik involved with herbage seed production in Norway (from left): Trygve S. Aamlid, Nicole P. Anderson and Lars T. Havstad. Photo: Ove Hetland

As Norway is in the Nordic region of Europe, climatic conditions can be challenging for seed growers, especially regarding winter survival of some species (e.g. ryegrass) and rains which occur during harvest. A relatively short growing period, but with long photoperiods, must also be considered. Due to these challenges, seed production practices from other regions of the world cannot always be transferred to Norway. Thus, 20-30 field trials are carried out each year, both at the NIBIO Landvik research station and in commercial seed grower's fields, aiming to improve seed crop management and increase seed yield under Norwegian growing conditions. The on-farm trials are normally carried out in close collaboration with the local Norwegian Agricultural Advisory Service.

Research areas

During the last 20-30 years, a special focus has been placed on identifying optimal plant growth regulator (PGR) strategies for the various grass and clover species. Except for reed canary grass, sheep's fescue and white clover, the PGR-response has been positive, reducing lodging pressure and increasing seed yield. Applying PGRs is now standard practice for Norwegian seed growers, with product, recommended rates and timing varying according to species.

The testing of new herbicides, desiccants, and fungicides, in many cases due to withdrawal of existing products, is another important area for research. During the last 20 years, much effort has been put into testing products controlling grass weeds in various grass seed crops and producing data for minor-use labels to be applied for. Many desiccants have also been evaluated since diquat has been removed from the market, and experiments are ongoing. Rust has not previously been a problem in Norwegian grass seed crops, but it has appeared in several species in recent years, and fungicide evaluation and registration efforts are underway.

As tall fescue is a new seed crop in the Norwegian seed production, field experiments into agronomic management of this species has been prioritized during the last 5 years. Research activity includes methods for establishment and strategies for both nitrogen and PGR-application. In addition, new ongoing trials are focused on optimal stubble and regrowth cutting strategies in autumn/early spring. Based on the results, a grower guide was published for tall fescue, as well as all the other Norwegian seed crops, (https://nibio.no/tema/mat/korn-og-frovekster/froavl) and is updated annually with the newest knowledge from the ongoing experiments.

According to EU and Norwegian legislation, organic farmers have long been required to use organically-grown seed of the desired species and variety, if available. However, there have been many exemptions to this rule, and for herbage seed in Norway, it has usually been accepted that organic farmers use mixtures of 30% conventionally grown and 70% organically grown seed. According to the EU's regulations (which are mostly implemented in Norway even though Norway is not an EU-member), such exemptions will be totally phased out by 2036, leading to a renewed interest for optimizing organic herbage seed production.

Our first experiments in organic grass seed production twenty years ago focused on intercropping with legumes for nitrogen supply. More recently, we have conducted research into establishment methods and the use of organic fertilizers such as pig-slurry and pelleted chicken manure. Organic experiments have now been carried out in timothy, meadow fescue, perennial ryegrass, tall fescue, and red clover.

Although most of the experiments, both in conventional and organic seed crops, have been funded by Norsk frøavlerlag and/or by governmental funding, larger research projects have usually involved additional funding from the Norwegian Research Council, and often there is financial input from seed companies, the Norwegian plant breeding company Graminor and/or chemical companies. During the last 10-15 years the following four larger projects have or are being carried out:

- 2013-2017: Increased seed yield of red clover by improved pollination by bumblebees and honeybees.
- 2015-2019: Safe seed supply of 'Litago' and future Norwegian cultivars of white clover.
- 2019-2022: Adapting Norwegian grass and clover seed production to a changing climate with more rainfall during seed maturation and harvest.
- 2024-2027: Precision fertilization and growth regulation of Norwegian grass seed crops using remote sensing technology.

Figure 3: Methods for improved pollination of red clover was the topic of the PolliClover-project carried out in 2013-2017.

In addition, we have just acquired funding for a new pilot project focused on identifying limitations to Norwegian seed production of perennial ryegrass with the aim of developing clear priorities for future research. Hopefully, this effort will lead to new experiments focused on refining and increasing Norwegian ryegrass seed production. As a result of climate change, we currently see a clear increase in the use of perennial ryegrass for forage as far north as the Arctic Circle (67°N). Graminor is also shifting its focus in forage breeding from timothy to winter-hardy varieties of perennial ryegrass.

Native seed production

Since the Rio-declaration in 1992, Norway has committed to preserving biodiversity. This commitment has resulted in the need for native seed for ecological restoration. In recent years, there has also been a rising demand for the collection and multiplication of locally adapted seed for flowering meadows and pollinator zones to provide nectar and pollen for threatened insects. As an authorized seed company, NIBIO Landvik has taken a lead in the production of native seeds, and we currently have contracts with 25 small-scale seed growers across Norway who are producing seed of more than 100 populations of native grasses and herbs. We also conducted research on native seed crop management, e.g. screening of selective herbicides and optimal timing and methods for seed harvest.

Figure 4. Swathing of an ox-eye daisy (Leucanthemum vulgare) seed crop in Vestfold, Norway. Photo: John Ingar Øverland

Obituary: Murray Kelly (New Zealand)

John Foley, PGGWrightson Seeds, New Zealand, Murray's colleague and co-worker, jfoley@pggwrightsonseeds.co.nz

Murray Kelly (Left), with Nicole Anderson, accepting the FAR 2016 Research of the Year Award.

A loyal supporter of the IHSG and regular attendee at our Conferences, Murray Kelly recently passed away on the 5th March, 2026, (aged 72 years) after a long and distinguished 50-year career in the seed industry.

Murray had an extraordinary 50-year career with Pyne Gould Guiness and PGG Wrightson Seeds and over these five decades, Murray's contribution to PGW Seeds and the wider arable sector was immense.

Murray started his career in 1976 at PGG Ceres Farm (Lincoln, NZ), where he developed incredibly broad experience by being involved in the company's breeding programmes, commercialisation activities, high grade seed and seed production. The small team at Ceres supported the development of the NZ seed industry. Murray

was the manager of Ceres farm for several years. The 1980's rural down hit the regions hard and Pynes and other mercantile firms traded through some very tough years. Cost savings were sought as business cut costs to survive, Murray was asked to restructure the Ceres Team and offered his own role as one that could be cut. This one-story sums Murray up beautifully – loyal to his team and always thinking of others.

In the 1990's the opening of markets gave NZ growers access to new profitable crops such as plantain, chicory and vegetable seeds. The skills required to grow these crops with growers and reps increased, leading to greater specialization. PGG recognised this, forming a technical services strategy which included a new arable research focus. From this, seed production and cereal research teams were formed with new agronomy roles. Murray was appointed senior agronomist to lead seed production research. Pynes may have been the first private seed company to do this anywhere, but they had the confidence to do this because Murray was on their staff, and by this stage he had built a reputation as a leading agronomist.

Murray was the centre of this group, and all his years of experience guided the staff that worked with him – it was the making of careers. Looking back, these were the best days to be an agronomist. The industry was ready for greater technical support, uniquely, many NZ growers were agronomists as much as farmers and wanted more knowledge and more advice. Murray was in his element, he always enjoyed the company of the growers, being out on farms held a far greater appeal than any office. He established firm friendships with many and dealt with different generations of the same family. His intellectual curiosity pushed crop management in new directions – "making holes to push boundaries" was a mantra that referred to what happens when herbicides were trialed on new crop species.

The early 2000's was a time of change, new chemistry, particularly the PGR trinexapac - ethyl (Moddus) entered the New Zealand market and coincided with the adoption of European cereal agronomic ideas brought to NZ. This gave Murray the tools to push crop agronomy in new directions, the trials programme generated management techniques across multiple crop species, increasing yield, production reliability and seed quality. In some species seed yields doubled, in others they quadrupled. In plantain stands for example, early commercial seed yields were 300kg/ha, after a decade of seed production research, Murray had lifted average seed yields to 1700kg/ha with the top growers achieving 2000kg/ha or more consistently.

Always there was Murray's enthusiasm for what he was doing: there were jars of dead insects collected in fields and stored on his office windowsill as references to pests found in crops. This was how Murray discovered the plantain weevil; a major pest found in plantain seed crops. His office was a shrine to everything seed production - book shelves full of scientific journals and publications, box files categorising research by crop type as well as seed samples and bags of seed. Murray during these years found his greatest role – mentoring young staff and over the ensuring decades, Murray worked alongside and guided dozens of staff who have gone on to become successful agronomists' and arable representatives. Many leaders within PGG Wrightson Seeds, and across the wider

arable industry, spent their formative years under Murray's guidance

Outside of the agronomy team there were the arable reps – a team who manage the company-grower relationship and who Murray worked closely with and had great affinity for. In later years, Murray shifted his focus from leading PGWS seed production research to exclusively mentoring the young reps in the arable team. It is hard to understate the immense pride and enjoyment Murray got from this last role – it was the culmination of all the preceding years. There are a cohort of talented young reps in the business now which will ensure Murray's legacy stretches far into the future.

The annual PGWS reps conference was a chance for the chemical companies to present their R&D on new products for the NZ market, also new formulations and label extensions for crops or new efficacy data. Murray made it very clear to the companies that "the presentation of no statistics was just a pretty picture and that chemical companies could present what they liked to other merchants but not to PGWS". They soon changed their ways and the science presented by the chemical companies improved considerably and so did the reliability of the products involved.

Murray had already been working with Australian seed growers and processing companies for some time, making many trips there in the late 1990s and early 2000's. In Tasmania he became close to Bramwell Hazelwood and others such as the team at Roberts Seeds. He remained highly respected in Australian seed production circles up until now. The merged business took him further afield and greatly increased his involvement in Oregon, leading to a sabbatical to the Willamette Valley in 2016 with wife Sherryn. Murray always gravitated to practical agronomists who had an affinity for their seed growers. Nicole Anderson, Oregon and European seed researcher, became a close friend of the Kelly's as did the Duerst's of Ioka Farms – Rob and Mindy have only recently been out here in NZ visiting Murray and Sherryn. Uruguay, Argentina and Brazil with their huge arable industries also had a need for Murray's expertise. He advised growers, seed industry agronomists and researchers in these countries on the latest seed production techniques.

Murray furthered his international research links – especially through the IHSG – where he became a core member. This had a huge benefit not just to PGWS but also the NZ arable industry. Murray was awarded FAR (Foundation for Arable Research) 2016 Researcher of the Year, presented by Nicole Anderson (see photo). In this era the NZ industry had three outstanding researchers in seed production technologies – Murray Kelly, Phil Rolston and Richard Chenowyth. NZ really did lead the way.

Murray's legacy hasn't happened by chance, it is through having the intellectual curiosity of a scientist, the agronomist's desire to grow better crops, unbelievable loyalty to the company and its staff and having a huge affinity for seed growers. He was a generous man – generous with his time and generous with his knowledge. Murray will be deeply missed for all of these reasons but mostly he will be missed for being an outstanding human being.

Obituary: Carlos Rossi (Uruguay)

Ana Faber, INIA, Uruguay, afaber@inia.org.uy

Carlos Rossi, INIA Uruguay Seed Scientist

Carlos Rossi passed away in late May 2026. Many IHSG members knew him and shared so many IHSG congresses and experiences with him over the years.

Carlos studied seed production at Oregon State University. Carlos was a dedicated professional who devoted his life to seed production, with a particular passion for forage species, but also for crops such as soybean, wheat, and barley. He was a person of exceptional knowledge, commitment, and warmth – a pillar and a true reference in Uruguay's seed sector, both professionally and as a human being. For me personally, he was a mentor and someone I held very dear.

His passing is a profound loss for our country's seed industry, and for all of us who were fortunate enough to work alongside him. We will remember him, acknowledging his valuable contributions to the sector and his place within the seeds community.

At INIA, we will always remember Carlos for his warmth, his integrity, and his unwavering commitment. We hope to honour his legacy by continuing the work he cared so deeply about.