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INTERNATIONAL HERBAGE SEED GROUP

NEWSLETTER

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IHSG

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IHSG Conference Approaches

The 5th International Herbage Seed Group Conference is rapidly approaching. It will be held at the University of Queensland, Gatton Campus (Brisbane, AUSTRALIA) from November 23-29, 2003. As previously the conference will be a mix of oral and poster presentations with plenty of time for discussion. There will also be a post-conference tour of temperate herbage seed production (in central and northern Victoria). As many previous conferences will testify the conference tours have been very enjoyable and informative. Many further details of the upcoming conference can be found inside.

This is the 1st edition of the newsletter to be produced entirely on the web. This hopefully will enable a more rapid and regular publication. As editor I will try and keep it as interesting as possible. As always any articles or information that you would like to send to the newsletter are very welcome. Please also circulate details to colleagues who are unaware of the newsletter.

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Contents

President's Column

This issue (No. 35) will be the first electronic-only edition of the International Herbage Seed Group newsletter. Thus, those reading it have received notice via e-mail that it was recently posted on the IHSG web site (http://www.css.orst.edu/ihsg/default.htm). In addition, this select group has also taken the few minutes necessary to register an e-mail address and update their membership at the web site. In particular, I'd like to thank those who took the initiative to do so following their receiving IHSG newsletter No. 34.

As most all who are reading this would be aware, I did make a general mailing to all members on the IHSG mailing list as of November 23, 2002, in an effort to encourage existing members to register and provide an e-mail address. I am pleased to report that my recent communiqué had the intended result; thus, many members have visited the web site to update their member status in the three-weeks since I posted that letter. (Note: "new members" registering after November 23 would not have received the above-mentioned correspondence.)

Also enclosed in the above-mentioned letter was the pre-registration form for the 5th International Herbage Seed Conference, which will begin on November 23, 2003 at the University of Queensland's Gatton Campus near Brisbane, Australia. This is, of course, a very exciting opportunity for all IHSG members. I sincerely hope to see many of you participate in that forum. The pre-registration form, along with the provisional program can be printed directly from the IHSG web site. Both are also incorporated into this newsletter, which can be printed as the PDF file you are reading online with Adobe Acrobat Reader. Additional information regarding the conference can be read on the IHSG web site, or also as a part of this newsletter.

Pre-registration was requested by February 1, 2003. This is necessary to help in making appropriate arrangements for the conference. Drs. Don Loch and Kevin Boyce are coordinating many of the details for a successful meeting and seed production tour. Additional information will be sent only to those completing the pre-registration form by the requested date.

I sincerely hope that as the year 2002 comes to an end you will each find an opportunity to reflect on the blessings that have been yours in the year just lived. And that you'll look forward to 2003 with great hope for continued successes in your professional endeavors and for your families.

Bill Young

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Problems and perspectives of grass seed production in the Czech Republic

Bohumir Cagas (1) and Jan Machac (2) ,

In the Czech Republic grasses grown for seed belong to the "small" crops sector. Within the Czech Republiche use of forage species has stagnated because of the slow development of different "green programmes" (green fallows, grasses in soil reclamation etc.). In contrast the sale of amenity species is steadily increasing. The largest sectorof the total seed production is of seed produced for export within "licenced multiplication", based on agreements between Czech growers and foreign seed companies.

Despite various technological problems, the acreage of grasses grown for seed (multiplication) is now in second place behind the cereals (Figure 1). Czechagriculture faces a large shortage of marketable crops and grasses are able to partially solve that problem. On the other hand, the economy of grass seed production within the Czech Republic is negatively influenced by the following factors:

- low price of grass seed caused by high seed stocks in Europe
- the subsidies in EU countries decrease their prices and duty free import makes the situation of our pro ducers abroad worse
- low seed yields compared to EU producers
- relative strength of the Czech crown making ex port more difficult

The acreage, production, yields and the quantities of grass seed exported is provided by the official report of the State seed control in the Czech Republic in harvest year 2000, issued by Department of Seed of Central Institute of Supervising and Testing in Agriculture in Prague (Table 1). The results do not correspond exactly with the production, because the harvest year and the year of certification are not in some cases identical as part of the seed harvested in one year is certified in the next year. However the trends are clear..

The price of grass seed reflects the price of grass seed in EU countries, but this is distorted by the subsidies, which are unobtainable for the Czech farmers. For that reason the Czech Association of the grass and legume seed growers has submitted a propsal for direct subsidies in the production of grasses and legumes, at 50 % of the level common in EU countries. The proposal is supported by the Czech ministry of agriculture and should increase the interest of Czech farmers in seed production of forages in the near future.

Within the Czech Republic grass seed production has been located for the past 40 years in the worst soil and climatic conditions of the country– in mountain and the semi-mountain regions. However in the last 6 – 8 years some of the seed production has been transferred into the richer regions. Unfortunately the seed producers in these new growing centers have insufficient knowledge, understanding or technical facilities, for forage seed production. These factors have had a negative effect not only on seed yields but also on the level of seed losses through the unsatisfactory post-harvest management of the seed. It is well known that grass seed failing to meet official standards cannot be utilised as feed like cereals. The inherent risks and financial costs associated with failing to meet these standards has discouraged new farmers. The Grassland Research Station Roznov-Zubri has concentrated for the past 20 years on improving grass seed production technology. We have studied new methods of controlling weeds, diseases and pests, methods of establishing new grass swards, nutrition and post harvest treatments including the introduction of new species and varieties.

The results of the leading grass seed growers, members of the Association of the grass and legume seed growers, who utilize fully the advisory service of the Grassland Research Station (Table 2) show the yields that can be achieved in the Czech Republic.

A new area of research included in the research programme of the Grassland Research Station Roznov –Zubri is the organic production of grass seed. This programme is focusing on the establishment of new grass seed crops, N-fertilization and control of weeds and diseases.

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(1) OSEVA PRO Ltd., Grassland Research Station Roznov-Zubri, Czech Republic

(2) Association of grass and legumes seed growers, Roznov, Czech Republic

Table 1 Production and export of the grass seed in the Czech Republic in 2000 compared to EU countries

Species	Acreage (ha)	Production (t)	Yield in the Czech Republic (kg.ha^{-1})	Yield in EU countries (kg.ha^{-1})	Export from the Czech Republic (*) t	% of production
Phleum bertolonii	20.0	5.3	265	680		
Phleum pratense	1402.04	287.33	205	400 - 700	120.9	42.1
Lolium x boucheanum	177.0	102.21	577	1250 - 1480	39.0	38.2
Lolium multiflorum subp. italicum	1866.83	1272.23	681	1000 - 1800	1710.4	134.4
Lolium multiflorum var. westerwoldicum	1083.86	409.76	378	1200 - 1800	1062.9	259.4
Lolium perenne	2148.14	496.60	231	500 - 1280	68.8	13.9
Festuca rubra	2223.64	820.53	369	400 - 1200	107.4	13.1
Festuca pratensis	2061.15	859.70	417	500 - 1100	833	96.9
Festuca ovina	127.30	17.67	139	500 - 1100	8.9	50.4
Festuca arundinacea	191.29	36.52	191	800 - 1400	56.6	155.0
Poa nemoralis	58.40	4.97	85			
Poa pratensis	490.21	67.21	137	600 - 1300	5.6	8.3
Poa compressa	0.30	0.10	333			
Arrhenatherum elatius	138.16	29.05	210	300 - 400	7.6	26.2
Cynosurus cristatus	20.50	14.71	718		0.1	0.7
Alopecurus pratensis	41.50	5.96	144		0.7	11.7
Agrostis tenuis	231.87	21.73	94	200 - 600	9.9	45.6
Agrostis gigantea	245.13	38.35	156		15.1	39.4
Bromus catharticus	7.50	6.73	897		3.0	44.6
Bromopsis inermis	0.50	0.05	100			
Dactylis polygama	15.00	1.08	72			
Dactylis glomerata	845.81	125.43	148	33 - 1000	96.6	77.0
Festulolium	1257.07	646.85	515		39.1	6.0
Trisetum flavescens	2.28	0.33	145	100 - 250		
Grass mixtures					257.8	
Total grasses	**14635.48**	**5265.10**	**360**		**4443.4**	**84.4**

*)the year of production does not copy the year of export, so that the export is in many cases higher than the production

Table 2 The seed yields of the best growers.

Species/year	Grower	Natural seed	Acreage (ha)	Certified seed	Yield (kg.ha^{-1}	Pure seed (%)
			1999			
Festulolium	ZP Otice	14130	32	13220	413	93.6
Festuca pratensis	Skalagro Skalicka	9360	8	5782	723	61.8
Cynosurus cristatus	ZD Ratibor	4130	8	3160	395	76.5
Alopecurus pratensis	AGPG Sedlnice	9239	18	6500	361	70.4
Dactylis glomerata	Mr Misak	4160	5	2550	510	61.3
			2000			
Lolium perenne	SPZ Novy Jicin	13760	13	11710	901	85.1
Festuca rubra	Skalagro Skalicka	13280	15	9260	617	69.7
Festuca pratensis	Skalagro Skalicka	8410	8	6174	772	73.4
Festuca rubra	AGPK Sedlnice	17930	15	12930	862	72.1
			2001			
Lolium perenne	Luha Jindrichov	33030	24	24370	1015	73.8
Festuca rubra	Luha Jindrichov	25660	20	18030	902	70.3
Festuca rubra	ZD Partutovice	24550	18	15430	857	62.9
Festuca rubra	Skalagro Skalicka	18750	15	11970	798	63.8
Poa compressa	ZP Otice	3200	3	1570	628	49.1
Dactylis glomerata	ZP Otice	2910	4	1960	560	67.4
Trisetum flavescens	Skalagro Skalicka	4805	7	1400	200	29.1

The data used in both tables came from the Report of the Central Institute for Supervising and Testing in Agriculture

Temperature Effects on Seed Production in Tall Fescue

Robert L. McGraw[1, 2], David A. Sleper[1], and Floyd W. Shockley[1]

Abstract

Tall fescue (*Festuca arundinacea* Schreber) seed yields in the cooler climate of Oregon are generally greater than seed yields in the warmer climate of Missouri. Differences in yield between the two locations are probably due to both climatic and cultural factors. We were interested in determining if temperature alone affects seed production of tall fescue. Fifteen ramets from each of 8 randomly chosen genotypes were removed from a spaced-planted 'Kentucky-31' tall fescue nursery in early spring prior to development of reproductive culms. Five ramets of each genotype were placed into one of three growth chambers set to a day/night temperature regime of 27/22 ºC, 22/17 ºC, or 17/12 ºC, selected to represent growing conditions in Missouri, an intermediate temperature range, and the seed production area of Oregon, respectively. Plants grown at warmer temperatures had more internodes per panicle and wider flag leaves. Plants grown at the coolest temperatures, however, had longer panicles and flag leaves, more seeds per panicle, heavier seeds, and greater seed yields per panicle and per plant than those grown at the warmest temperatures. Temperature appears to be an important factor in determining the seed production potential of tall fescue with cooler temperatures promoting increased seed yields.

Introduction

Tall fescue (*Festuca arundinacea* Schreber) was first introduced in the U.S.A. in the late 1800s from Europe as a replacement for declining populations of meadow fescue, *Festuca pratensis* Hudson (Buckner et al. 1979, Terrell 1979). It is a highly adaptive, cool-season perennial bunchgrass with high nutritive content and good seed production. Since its introduction, it has become widely distributed across much of the eastern and central U.S.A., as well as some intensive production regions in the Pacific Northwest (Buckner et al. 1979), but its intolerance to extreme temperatures and drought restrict its wide use in extremely northern latitudes, at higher elevation, and in the desert Southwest. However, recent work suggests that tall fescue can grow quite well in certain Canadian provinces (previously thought to be beyond the northern edge of tall fescue's distribution), and that it's spread throughout Canada is more limited by summer drought than winter coldness (Fairey and Lefkovitch 1993, 1998). It is the most widely used cool-season perennial in the Midwest because of its ability to produce good forage growth during the cool spring months and then resume growth in the fall after a brief senescence during the hot, dry summer months (Matches 1979, Sleper and Buckner 1995). Frequent defoliation, either by manual mowing or grazing, often results in production of dense, turflike sods (Sleper and Buckner 1995).

'Kentucky-31' was one of the first tall fescue cultivars to be officially evaluated and released for forage production (Buckner et al. 1979). By the 1950s and 1960s, additional cultivars of tall fescue had become available, but KY-31 continued to dominate the majority of tall fescue pastures, especially in the region known as the "central transition zone" where much of the country's forage fescue is currently grown (Sleper and Buckner 1995). Seed production in this zone is simply a natural by-product of growing tall fescue for use as forage in extensive livestock growing regions of the Midwest. The majority of certified seed of forage and turf tall fescues is produced in the Pacific Northwest, primarily in Oregon (Youngberg and Wheaton 1979, Sleper and Buckner 1995). Prior to 1983, almost all production of tall fescue was of forage cultivars. However, the introduction of turf-type cultivars has led to a rapid shift in production (Young 1997). Tall fescue remains green during the dry summers in Oregon, which has a natural climatic advantage in that it provides mild, wet winter and spring months to promote grass growth and dry, low-humidity summer months, which favor harvesting clean, high-germination seed (Buckner et al. 1979, Youngberg and Wheaton 1979).

In the Midwest, tall fescue begins to produce reproductive panicles in mid to late spring that will eventually lead to formation of seed. Panicle development and seed development usually require about 2 months, with seed generally harvested no later than mid-June. By early July, tall fescue has dropped all of its seed and goes into a dormant stage until September and can be clipped or grazed for hay. Fall regrowth can be used for fall or winter grazing, but this management system results in much lower seed yields (Youngberg and Wheaton 1979).

It has generally been accepted that the peak seed production for tall fescue would be at a medium or lower temperature because decreases in temperature have previously been shown to increase flowering (Templeton et al. 1961b). Van Keuren and Canode (1963) suggested that tall fescue requires warm temperatures and long day lengths to produce sufficient vegetative material prior to flower induction, but flowering was only induced when day lengths were short and temperatures were 5 to 10 ºC. However, the majority of seed production still occurs in early summer in the central transition zone (Sleper and Buckner 1995, USDC 1994).

Tall fescue seed yields in commercial seed production fields in Oregon are generally greater than seed yields obtained from pastures harvested for seed in Missouri. Differences in seed yields could be due to differences in production practices

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and/or climate differences between the two locations. Our objective was to determine if temperature affects seed production of tall fescue. The temperatures were selected to represent Missouri, Oregon, and an intermediate range.

Materials and Methods

Fifteen ramets from each of 8 randomly chosen genotypes were removed from a spaced-planted Kentucky-31 tall fescue nursery at the University of Missouri Bradford Farm facility near Columbia, Missouri in early spring prior to development of reproductive culms. Each ramet was transplanted into separate pots. Five ramets of each genotype were placed in each of three growth chambers set to three day/night temperature ranges similar to temperatures that occur during periods of seed production in Missouri (27/22 °C), Oregon (17/12 °C), and an intermediate temperature (22/17 °C). Thus, there were 40 observations in each temperature treatment.

Plants remained in the growth chambers until panicles were produced and removed when the seeds were mature. Culms were harvested from each ramet, the number recorded, and air dried. The length of the panicle was measured from the peduncle internode to the tip of the panicle and the number of internodes per panicle counted. The panicles were separated from the culm at the peduncle internode and weighed with the seed. The length and width of the flag leaf were measured. The flag leaf area was estimated by multiplying the length times the width at the midpoint by 0.905 (Kemp, 1960).

Seeds were hand threshed from each panicle and the total seed weight determined. The weight of 100 seed was measured and the number of seed per panicle was calculated by dividing the seed weight per panicle by the 100-seed weight and multiplying by 100. The seed yield per plant was calculated by multiplying the seed weight per panicle by the number of panicles per plant.

The data were analyzed using the Statistical Analysis System (SAS) (SAS Institute, 1985) to perform ANOVA (SAS, Proc. GLM). The experiment was analyzed as a randomized complete block design with a split-plot arrangement. The main plot was temperature and the sub-plots were genotype and temperature x genotype. There were no differences among genotypes so data were pooled within temperature treatments. Fisher's Least Significant Difference (LSD) tests were performed to test for differences between temperature treatments, $P \leq 0.05$.

Results

At the coolest temperatures, which were selected to represent Oregon, the panicles were longer and heavier than panicles produced at the warmest temperatures, which were selected to represent Missouri (Table 1). Panicles from the coolest temperature treatment were over twice as heavy as panicles from the warmest temperature treatment (0.41 g and 0.19 g,

Table 1. Panicle and flag leaf measurements of tall fescue genotypes grown in growth chambers under three temperature treatments.

	Temperature ° C (day/night)		
	27/22	22/17	17/12
Panicle length (cm)	16.6b†	19.5a	18.9a
Panicle weight (g)	0.19b	0.37a	0.41a
Internodes per panicle (no.)	3.69a	3.68a	3.52b
Flag leaf length (cm)	6.77b	6.38b	7.45a
Flag leaf width (cm)	0.22a	0.19a	0.16b
Flag leaf area (cm^2)	1.52a	1.23a	1.15a

† Means within a row followed by the same letter are not significantly different at the 0.05 level.

Table 2. Seed yield components of tall fescue genotypes grown in growth chambers under three temperature treatments.

	Temperature ° C (day/night)		
	27/22	22/17	17/12
Panicles per plant (no.)	4.7a†	4.9a	4.4a
Seeds per panicle (no.)	46b	111a	119a
100-seed weight (g)	0.20b	0.23a	0.25a
Seed weight per panicle (g)	0.10b	0.26a	0.30a
Seed yield per plant (g)	0.47b	1.27a	1.32a

† Means within a row followed by the same letter are not significantly different at the 0.05 level.

respectively). Panicles produced at intermediate temperatures were similar to those at cooler temperatures but did not differ at the warmer temperatures. In contrast, there were fewer internodes per panicle produced at the cooler temperatures than at either the warmer or intermediate temperatures.

Flag leaves developed at the cooler temperatures were longer but narrower than those developed at the warmest and intermediate temperatures (Table 1). Although the estimated flag leaf area was numerically greater at the warmer temperature, the areas were not significantly different among temperature treatments.

There were no significant differences among the three temperature treatments for number of panicles (Table 2). All other seed yield components were significantly different between the warmest and coolest temperatures. Seed yield components produced at the intermediate temperatures were similar to those at the cooler temperatures but differed from the warmer temperatures. Seed weight per panicle was three times greater at the coolest temperatures as compared to the warmest temperatures (0.30 g and 0.10 g, respectively) (Table 2). The increased yield was caused by more and heavier seed produced at the cooler temperatures. Panicles produced at the coolest temperatures had 2.5 times more seed than panicles at the warmest temperatures (119 and 46, respectively). One-hundred seed weights averaged 0.25 g at the coolest temperatures and 0.20 g at the warmest temperatures. Except for panicle number, all seed yield components measured were greater at the cooler temperatures compared to the warmest temperature. Thus, the total seed yield per plant was 2.8 times greater at the coolest temperature compared to the warmest temperature (1.32 g and 0.47 g, respectively).

Discussion

Tall fescue seed yields produced in the cooler climate of Oregon are generally greater than seed yields produced in the warmer climate of Missouri. Production methods also vary greatly between the two locations. In Oregon, plants are grown in rows and managed specifically for seed production. Tall fescue seed production in Missouri comes mainly from pastures that are also used to raise livestock. Differences in yield between the two locations are probably due to many factors both climatic and cultural. We were interested in determining if temperature alone affects seed production of tall fescue.

When plants were placed in a growth chamber set at day/night temperatures selected to represent Oregon, the panicles weighed over twice as much as panicles produced at the warmest temperatures, which were selected to represent Missouri (Table 1). Most of this increase in weight was due to increased seed yields (Table 2). If seed weights are subtracted, panicles produced at the cooler temperatures averaged only 0.02 g heavier than panicles at the warmest temperatures. Flag leaves developed at the coolest temperatures were longer but narrower than those at the warmest temperatures. Although flag leaf areas tended to increase as temperatures increased, the effect was not significantly different among treatments.

Seed production at the coolest temperatures was 2.8 times greater than for plants grown at the warmest temperatures (Table 2). This difference in seed production was not due to the development of more panicles. The number of panicles per plant were similar among the three day/night temperature treatments tested. The number of panicles may have been set before the plants were dug from the field and placed in the chambers.

All seed yield components, except panicles per plant, were greater at the coolest temperatures compared to the warmest temperatures. Panicles that developed in the cooler temperatures representing Oregon had 2.5 times more seeds and the seed were 25% larger than panicles that developed at temperatures representing Missouri. The larger seeds may have more energy for germination and be of better quality than smaller seeds developed at warmer temperatures. Greater seed number and larger seed at the cooler temperatures resulted in panicles with 3 times more seed.

Plants placed in growth chambers set at day/night temperatures selected to represent the seed production area of Oregon produced more seed and larger seed than plants at temperatures representing Missouri. We believe that temperature plays a significant role in the differences observed in fall fescue seed yields between Oregon and Missouri.

Acknowledgements

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References

Buckner, R.C., J.B. Powell, and R.V. Frakes. 1979. Historical development. P. 1-8. *In* R.C. Buckner and L.P. Bush (ed.) Tall fescue. Agron. Monogr. 20. ASA, CSSA, and SSSA, Madison, WI.

Fairey, N.A., and L.P. Lefkovitch. 1993. Agronomic feasibility of producing seed of tall fescue in the Peace River region. Canadian J. Plant Sci. 73: 123-129.

Fairey, N.A., and L.P. Lefkovitch. 1998. Effects of method, rate and time of application of nitrogen fertilizer on seed production of tall fescue. Canadian J. Plant Sci. 78: 453-458.

Kemp, C.D. 1960. Methods of estimating the leaf area of grasses from linear measurements. Ann. Bot. 24:491-499.

Matches, A.G. 1979. Management. P. 171-199. *In* R.C. Buckner and L.P. Bush (ed.) Tall fescue. Agron. Monogr. 20. ASA, CSSA, and SSSA, Madison, WI.

Meyer, W.A., and C.R. Funk. 1989. Progress and benefit to humanity from breeding cool-season grasses for turf. P. 31-48. *In* D.A. Sleper et al. (ed.) Contributions from breeding forage and turf grasses. CSSA Spec. Publ. 15. CSSA, Madison, WI.

Sleper, D.A. and R.C. Buckner. 1995. The fescues. P. 345-356. *In* R.F. Barnes et al. (ed.) Forages. Vol. 1. An Introduction to grassland agriculture. 5th ed. Iowa State Univ. Press, Ames.

Templeton, W.C., Jr., G.O. Mott, and R.J. Bula. 1961a. Some effects of temperature and light on growth and flowering of tall fescue, *Festuca arundinacea* Schreb. I. Vegetative development. Crop Sci. 1: 216-219.

Templeton, W.C., Jr., G.O. Mott, and R.J. Bula. 1961b. Some effects of temperature and light on growth and flowering of tall fescue, *Festuca arundinacea* Schreb. II. Floral development. Crop Sci. 1: 283-286.

Terrell, E.E. 1979. Taxonomy, morphology, and phylogeny. P. 31-39. *In* R.C. Buckner and L.P. Bush (ed.) Tall fescue. Agron. Monogr. 20. ASA, CSSA, and SSSA, Madison, WI.

U.S. Department of Commerce. 1994. 1992 census of agriculture. Vol. 1. Geographic area series. Part 51. U.S. summary and state data. USDC, Washington, DC.

Van Keuren, R.W., and C.L. Canode. 1963. Effects of spring and fall plantings on seed production of several grass species. Crop Sci. 3: 122-125.

Young, W.C., III. 1995. *Festuca arundinacea* (Schreb. (tall fescue) in the USA. *In* D.T. Fairey and J.G. Hampton (ed.) Forage seed production. Vol. 1. Temperate species. CAB Int., Wallingford, UK.

Youngberg, H., and H.N. Wheaton. 1979. Seed production. P. 141-153. *In* R.C. Buckner and L.P. Bush (ed.) Tall fescue. Agron. Monogr. 20. ASA, CSSA, and SSSA, Madison, WI.

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In Brief

Newsletter on Organic Seeds and Plant Breeding

ECO-PB (The European Consortium for Organic Plant Breeding) are producing a monthly newsletter on organic seeds and plant breeding. This newsletter can be viewed at www.eco-pb.org and is also a good strating point for information on the current issues associated with organic seed production of forage species as well as other plant species, and issues related to plant breeding in an organically acceptable manner. Good links to many seed specific sites can also be found here.

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2003 Conference

5TH INTERNATIONAL HERBAGE SEED CONFERENCE

The 5th International Herbage Seed Conference will be held on the Gatton Campus of the University of Queensland. This is in the heart of the Lockyer Valley, an intensive farming region a little over an hour's drive from Brisbane International Airport. Gatton is the main centre for the University's seed technology courses, and is strategically located close to most of the subtropical seed houses in Australia.

The Conference will start with registration and welcoming activities on Sunday 23 November 2003. Because this is during the University summer vacation, on-Campus accommodation will be available to house Conference delegates, either in single rooms in one of the halls of residence or in a limited number of motel-style units.

The morning program over the next three days (24-26 November) will be given to the presentation of delegates' papers either in oral or in poster form. During the afternoon sessions, short trips will be made to a range of field sites through south-east Queensland.

In response to the many requests from North American and European members, the post-Conference tour (27-28 November) highlights the temperate seed production areas in central and northern Victoria. Because Australia is a big country, this will involve travelling by air to Melborne to begin the tour. Over the next two days, delegates will be able to see a number of seed herbage seed crops. Visits will also be made to commercial premises and seed cleaning plants.

On 30 November, delegates can continue their travels from Melbourne to various destinations depending on their preference.

A provisional programme and preliminary registration details can be found on pages 9 and 10.

PROVISIONAL PROGRAM FOR 5TH INTERNATIONAL HERBAGE SEED CONFERENCE - 2003

Sunday 23 November 2003
Registration and (evening) welcoming cocktails

Monday 24 November 2003
9:00-10:30 am:Official Conference opening
Plenary speaker #1 (a global perspective on future trends and opportunities in herbage seed markets)
Plenary speaker #2 (overview of the Australian herbage seed industry)
11:00-12:30 pm:Oral presentations
1:30-3:00 pm:Poster presentations
3:30-5:00 pm: Tour of Gatton Campus and facilities
Evening BBQ

Tuesday 25 November 2003
9:00-10:30 am:Plenary speaker #3 (to be announced)
Oral presentations
11:00-12:30 pm:Poster presentations
1:00-6:00 pm:Tour to Brisbane (herbage seed marketing at Heritage Seeds, Rocklea, and amenity grass research at Redlands Research Station)
7:00-10:30 pm: Conference dinner

Wednesday 26 November 2003
9:00-10:30 am:Plenary speaker #4 (trends in herbage seed markets in developing countries
Oral presentations
11:00-12:30 pm:Poster presentations
1:30-6:00 pm:Tour to Toowoomba (seed company visits)

Thursday 27 November 2003
(am)Air travel Brisbane-Melbourne
(pm)Post-Conference tour of temperate herbage seed production in central & northernVictoria

Friday 28 November 2003
Post-Conference tour of temperate herbage seed production (central & northern Victoria)

Saturday 29 November 2003
Completion of post-Conference tour

Sunday 30 November 2003
Departure

PRE–REGISTRATION FORM FOR THE
5TH INTERNATIONAL HERBAGE SEED CONFERENCE

University of Queensland Gatton Campus (Brisbane, AUSTRALIA)
November 23-29, 2003

Name ______________________________

Organization ______________________________

Address ______________________________

City/State ______________________________

Country ______________________________

Telephone ______________________ Fax ______________________

E-mail address ______________________________

__NOTE__: Only those persons who complete the above information and return it to the conference organizers will receive the next communiqué for the 5th International Herbage Seed Conference

Please provide us with additional information:

I am interested in presenting a poster ☐

I am interested in giving an oral presentation ☐

(The organizers will make the final decision on selection of oral presentations.)

This form, or the information it requests, must be received by February 1, 2003:

Dr. Don S. Loch

QDPI - Redlands Research Station

P.O. Box 327

Cleveland, Queensland 4163

AUSTRALIA

Conference Notes

Symposium on Molecular Breeding of Forage and Turf

The 3rd International Symposium on Molecular Breeding of Forage and Turf will be held in May 18-22, 2003, in Dallas, Texas, USA.

The symposium will start on Sunday, May 18, with a reception. This will be followed by full day schedules of oral and poster sessions on Monday and Tuesday. On Wednesday, the participants will tour The Noble Foundation in Ardmore, Oklahoma. Thursdays' program will include more oral and poster presentation followed by a tour of the Texas A&M Research and Extension Center in Dallas, TX. Optional pre and post conference tours of the important attractions in the Dallas-Fort Worth area will also be available.

This comprehensive symposium will cover many important aspects of Forage and Turf improvement. The top scientists from around the world will address various topics, including biotic and abiotic stress tolerances, application of molecular markers and genomics, transgenic modification of flowering and forage quality, bioinformatics for breeders, intellectual property rights, and risk assessment and biosafety.

For detailed information, registration, and abstract submission please visit the website at https://www.register-for.com/mbft/

1st International Conference on Turfgrass Management and Sciences for Sports Fields

Dr. Panayiotis Nektarios of the Agricultural University of Athens, Greece, wishes to announce that the 1st International Conference on Turfgrass Management and Science for Sport Fields will be held in Athens, Greece, June 2-7, 2003. The conference is under the auspices of International Society for Horticultural Science (ISHS). The conference coincides with the preparations for the 2004 Olympic Games, for which turfgrasses constitute the main surface for many of the outdoor sports and activities. The knowledge that will derive from the conference will be an essential tool for turfgrass establishment and management for the Olympic Games. Information about this conference can be found at http://www.turfgrass-conference.aua.gr

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25th EUCARPIA Fodder Crops and Amenity Grasses Section Meeting and 15th EUCARPIA Medicago spp. Group Meeting

This meeting on "Biodiversity and Genetic Resources as the Bases for Future Breeding" will be held in Brno, Czech Republic, from Monday September 1st - Thursday September 4th 2003. Topics will include current state of genetic resources, methodology of breeding for resistance and quality, genetic markers for genetic resources characterisation and breeding and ecological role of grasses and legumes. The meeting will include oral presentations, poster presentations and a field trip to research institutes and plant breeding stations working on medicago, clovers forage and amenity grasses. Further details can be found at http://www.vupt.cz or email eucarpia@vupt.cz

British Grassland Society 7th BGS Research Conference
1st-3rd September 2003 to be held at the University of Wales, Aberystwyth,UK. Further information on this conference is available from the BGS Office at the following address, PO Box 237, University of Reading RG6 6AR, UK. Telephone +44 1189 318189, fax +44 01189 666941 or email:bgs@patrol.i-way.co.uk

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