Procedures for Evaluation and Recommendation for Registration of Cultivars of Lentil for Western Canada
March 25, 2015

In order for a lentil cultivar to be registered by the Canadian Food Inspection Agency (CFIA) of Agriculture and Agri-Food Canada, a recommendation of support for registration must be obtained from the Prairie Registration Committee for Pulse and Special Crops (PRCPSC). To obtain that recommendation the candidate cultivar must normally be evaluated and meet standards in the Lentil Registration Recommendation Trial (LRRT) for a minimum of two years. In order to be evaluated in these trials the sponsor of the candidate cultivar must obtain permission to enter the candidate cultivar into those trials.

Requirements for entry into the Lentil Registration Recommendation Trial:

The following information must be provided to the test coordinator: name of entry, name of sponsor, name of breeding institution, seed weight, market class and the maturity of the candidate cultivar relative to a current check cultivar. All entries are required to have improved levels of ascochyta and anthracnose resistance in comparison to the old check cultivars Laird, Eston and CDC Richlea.

The structure and composition of registration trials is flexible from year to year depending on availability of seed, special characteristics of entries (for example, herbicide tolerance) and availability of appropriate checks.

The maximum size of a LRRT is 36 entries including checks. Trial "A" consists of lentil checks and breeding lines with imidazolinone heribicide tolerance (more than 90% of lentil crops in Canada are tolerant to this herbicide. Trial "B", if necessary, will only include non-imidazolinone tolerant lentil lines. A third trial "C" may be needed if the number of entries in Trial "A" is exceeded. If this is the case, lines will be grouped appropriately with checks by market class. Greenhouse confirmation of imidazolinone tolerance is sufficient to demonstrate tolerance. The amount of seed required is 35,000 germinating seeds with no seed treatment.

Lentil Registration Recommendation Trial Procedures:

Data are reported for all sites, and if available, for dryland, irrigated and disease nurseries. The number of sites may vary depending on the location and the participation of co-operators. No fees are charged for entering the trials. Trial managers receive no compensation. Anyone wishing to grow the trial without funding may do so at the discretion of the coordinator but this is dependent on both availability of seed and cooperator experience/capability of growing lentils. Two years of testing are required. The tests are arranged in a randomized complete block design with three replicates. At least one appropriate check is assigned to each market class represented in the trial. The number of locations may vary from year to year. It is desirable to have up to 10 sites/yr with valid data, and this may vary from year to year based on land availability, weather conditions, appropriateness of location, industry developments and availability of collaborators. Typical locations in in Saskatchewan and Alberta include Elrose, Sanctuary, Wilkie, Rosthern, Saskatoon, Floral, Limerick, Lucky Lake, Moose Jaw, Brooks AB and Bow Island AB. Irrigated and inoculate disease sites will normally be grown at the North Seed Farm, University of Saskatchewan, and/or with additional sites possible at Preston Avenue.

Growing season data collected at each site will ideally include days to flower, plant height, days to maturity, days to maturity, lodging, disease development as required/appropriate, shattering (if appropriate), and herbicide damage/herbicide tolerance (if appropriate). Post harvest

measurements will include seed yield for all sites, and for other selected sites, seed weight and other appropriate marketing characteristics such as seed diameter distribution, seed thickness distributions, seed coat colour, seed coat pattern, and cotyledon colour as needed, possible or affordable. Acceptable coefficient of variation (CV) for seed yield is 16%. Sites with CV for seed yield in the range of 16-20% may be omitted at the discretion of the coordinator.

Disease reaction data will be collected, if appropriate, for ascochyta blight (plant and or seed ratings), anthracnose, and stemphylium blight. DNA marker-assisted screening is encouraged if robust protocols are published and available for use. If appropriate, disease data will be recorded for field trials at inoculated and irrigated sites near Saskatoon, SK. Post-harvest Seed infection data may be recorded and included. Disease reactions may also be recorded based on indoor screening of a subset of advanced lines if resources are available. Disease reactions for other field diseases may also be included in evaluation reports if conditions are favourable for development of other diseases such as sclerotinia, botrytyis, stemphylium blight, fusarium wilt, and aphanomyces root rot.

Quality data collected includes seed coat colour, cotyledon colour, seed weight, and for some market classes, diameter and thickness separation of seeds over roundhole and slotted screens. Other post-harvest quality data may be collected at the discretion of the coordinator.
Check cultivars for representative market classes of lentil are determined annually by the PRCPSC and the trial coordinator. Entries are compared to the same set of checks for all years of the LRRT. Checks are normally replaced when a better performing cultivar is registered in that market class. All tests are managed and harvested according to standard and sound agronomic and scientific practices as appropriate for each test site. The professional code of ethics developed by the PRCPSC will be strictly adhered to by the coordinator, trial managers, and the PRCPSC. In cases where herbicide tolerant lentil breeding lines are evaluated, trial protocols may be amended at the discretion of the coordinator, or appropriate additional trials may be designed, provided that suitable check cultivars are used in the trials.

Inspection of trials:
The trials are open for inspection by variety sponsors, PRCPSC members, and CFIA staff. If concerns are detected they should be communicated to the trial manager and the test coordinator.

Submission of data for support for registration:
The test coordinator will provide a summarized data package for all sponsors of final year entries in the trials. This package must be distributed to all members of the PRCPSC, and the CFIA-Variety Registration Office for arrival at least one week prior to the annual meetings of the PRCPSC. The data submitted may include other pertinent supplementary data available. Acceptability of any supplementary data will be determined by the PRCPSC membership.
The principle of merit is used by the members of the PRCPSC in their decision regarding the support of a candidate for registration. The candidate cultivar must demonstrate merit when compared to the check and other registered cultivars. A candidate has merit when, considering all traits including agronomic performance, disease reaction and end-use suitability, its overall performance is equal to or better than the check cultivars with which the candidate has been compared during the two years of testing. It is recognized that certain criteria are mandatory for certain regions or market classes and that minor deficiencies in certain parameters may be

outweighed by advantages in others. A candidate cultivar may be supported for registration based on performance advantage in a particular zone of Canada and need not excel across the whole region. Once a candidate cultivar has been supported for registration, both the sponsor and the secretary of the PRCPSC shall submit the data summaries, along with copies of letters of support from the PRCPSC to the CFIA-Variety Registration Office, Agriculture and Agri-Food Canada, Ottawa.

If the coordinator establishes a fee structure, the fee will be charged for all entries in the trial except check cultivars. This fee will be ratified annually by the PRCPSC. The coordinator will use the fee to prepare trials, to obtain disease reactions, to conduct quality evaluation, analyse data, and to prepare and to distribute test results.

APPENDIX (as of March 2015)

A. Lentil Registration Recommendation Trial Coordinator

Dr. Bert Vandenberg Crop Development Centre University of Saskatchewan 51 Campus Drive Saskatoon,
Saskatchewan Phone: 306-966-8786 Fax: 306-966-5015 email: vandenberg@usask.ca

B. Check Cultivars

2015 checks for first and second year entries, if required by market class:

Coop A: CDC Maxim (small red), CDC Impala (extra small red), CDC KR-1 (large red) , CDC SB-3 (Spanish brown), CDC Imvincible (small green), CDC QG-3 (green cotyledon); CDC Impower (large green)

C. Summary of Deadlines:

Due date for intention to enter the Lentil Registration Recommendation Trial: **February 15**.-Due date for seed delivery to co-ordinator: **March 15** -Amount of seed required: **35,000 germinating seeds; no seed treatment**.