2nd National New Zealand Soil Judging Competition, Marlborough, 25 – 27 November 2022

GENERAL INFORMATION

As part of the New Zealand Society of Soil Science (NZSSS) Conference in Marlborough, December, 20122 ("Aoteaora's most precious resource- past, present, future") the 2nd New Zealand soil judging contest is being held. The occasion is a great opportunity for students, researchers and people interested in soils to learn, network, and experience the landscapes and soils of Marlborough in the South Island of New Zealand.

The scope of the soil judging contest is for participants to develop their knowledge and practical skills and then apply these to describe, understand and interpret soil characteristics in the field. Participants (in the form of teams and individuals) will describe a series of soil profiles using basic field tools, selected standards, and guidelines. The first two days are aimed at familiarizing participants with the procedure and the third day is a competition day, where participants can put their skills to the test. The winners will be selected based on their ability to correctly describe each soil, evaluate potential soil functions, and interpret their capacity to perform under different land use and management practices. Teams are allowed to have a coach. If teams are unable to find a coach, there will be several soils professionals on site to guide them on the practice days.

This event follows the successful 1st International Soil Judging Contest that was held during the 20th World Congress of Soil Sciences in Jeju, Korea in June 2014, and closer to home, the contests run by Soil Science Australia, starting in Hobart (2012) and the first Australasian competition held in Wanaka, as part of the Joint NZSSS and SSA conference in Queenstown, in December 2016. In New Zealand, competitions have since been held in Napier (2017), Golden Bay (2020) and Waipara (2021). These events build on the significant heritage and experience of soil judging competitions in North America, and highlight the valuable educational opportunity offered to practice soil description in the field in a challenging, yet supportive, environment.

Training (2 days)

Introductory resources will be provided which will give an overview of the site, profile descriptions and soil classification standards, landscapes and soil conditions of New Zealand and Marlborough with a focus on the competition area.

The soils in question will cover a compact geographical area but will include a range of topographic, parent material and moisture regime conditions. The training and competition profiles will include Recent, Pallic, Brown, Gley, or Ultic soil orders of the NZSC, which occur in this area of Marlborough.

The Contest (1 day)

Participants (teams or individuals) will describe the soil profiles based on the available field tools and selected standards and guidelines. Evaluation of potential soil functions and interpretation of the capacity of the soil to perform under different land use and management will be also scored. The three competition soil profiles will be selected from the soil types that occur in the area used for the training day.

Equipment and Reference Materials

Equipment for the soil judging competition will be partially provided by the organizers, and partially provided by competitors. If competitors are unable to source equipment some spare gear will be provided on site.

For any questions around gear requirements please contact josh.nelson@lincoln.ac.nz.

Below is an example of a standard Lincoln University soil description kit for reference (*Photo is for reference only, not all gear is required for soil judging. See table below for more information).*

Indicative gear to be sourced by competitors (*) indicates required/strongly recommended gear	**Gear provided**
• Niwashi (*) • Digi Digi • Putty knife • Spade • Paint brush • Spray bottle (*) • Soil storage containers (Muffin tins recommended (*) • 2mm sieve (*) • Clipboard (*) • Soil Description Handbook (Milne) • Munsell Soil Colour Book (*) • NZ Soil Classification Handbook (*) • Pencils/pens (*) • Calculator (*)	• 10X Hand lenses • Measuring tapes (pre-set for each pit as well as spare copies) • Description/marking sheets • SJC Handbook • Inclinometer • Wash bottles • Spare copies of Soil Description Handbook (Milne) • Spare copies of NZ Soil Classification Handbook • Chemical data (No chemical kits required)

Handheld electronic devices (laptops, PDA's, mobile phones, smart phones, tablets) will NOT be permitted during the contest. Calculators however are allowed and strongly encouraged to bring.

The following reference materials will be permitted during the contest:

- This handbook: printed copies will be provided by the organizers to all team members and coaches at registration (personally printed copies with notes are allowed).
- Milne, J.D.G., Clayden, B., Singleton, P.L. and A.D. Wilson (1995). Soil Description Handbook. Manaaki Whenua Press, Lincoln, Canterbury, New Zealand (provided by the organisers – one per team).
- Hewitt (2010). New Zealand Soil Classification. Landcare Research Science Series No. 1, Manaaki Whenua Press, Lincoln, Canterbury, New Zealand. http://digitallibrary.landcareresearch.co.nz/cdm/singleitem/collection/p20022coll1/id/268/rec/19
- Schoeneberger, P.J., D.A. Wysocki, E.C. Benham, and Soil Survey Staff (2012). Field book for describing and sampling soils, Version 3.0. Natural Resources Conservation Service, National Soil Survey Center, Lincoln, NE. https://www.nrcs.usda.gov/resources/guides-and-instructions/field-book-for-describing-and-sampling-soils

Conduct of the Training

The afternoon of Friday 25th, and Saturday 26th November will be practice days at the competition location. On the Friday afternoon there will be an introductory presentation and 1 practice pit, and three practice pits on the Saturday. The aim for the practice day is threefold:

1) **For the teams (under the guidance of coaches and/or experienced soil professionals) to become familiar with the soils that will constitute the competition**. Teams will receive the relevant laboratory data and the already filled scoresheets for the practice pits that can be used for guidance, so that they can 'calibrate' their descriptions. Note that on the competition day, coaches will not be allowed to speak to, or assist their teams in any way.

2) **To be aware of the competition rules and format**. Following the rules of the 2nd New Zealand Soil Judging Contest 2022 (as detailed in this document) a typical section will be selected in each pit and clearly designated as the control section (restricted area / no pick zone) by the contest officials. The control section will be used for measurement of horizon depths and boundaries; it will constitute the officially scored profile and must remain undisturbed. All measurements should be made within the designated area. A measuring tape will be placed in the control section at all pits and will be maintained by official pit monitors. Up to a maximum of seven (7) horizons will be described within a given profile depth. A card at each site will give the profile depth to be considered, the number of horizons to be described, and chemical or physical data that may be required for classification. Every participant will get 1 scoresheet per practice pit. The scoresheets are to be filled considering the instructions of the coaches, the supplied laboratory information, and the instructions of this handbook.

3) **Most importantly, this is an educative event.** The goal is for participants to upskill in soil profile description, site interpretation and to learn in a supportive environment. It is also an opportunity to connect with other soil scientists.

Competition Format

This competition will be 'open book': the Competition Handbook may be used during the competition. Additionally permitted texts include: the New Zealand Soil Classification (Hewitt, 2010), the Soil Description Handbook (Milne et al., 1995) and the Field book for Describing and Sampling Soils (Schoeneberger et al., 2012). The use of hand-held electronic devices (mobile phones, tablets etc) is always prohibited during the competition.

At each judging site, a pit will be excavated, and the control sections / restricted areas will be designated on the pit walls for the measurement of horizon depth and determination of boundary distinctness. The restricted area will be clearly outlined, and a nail will be placed 'somewhere in the third horizon'. A tape measure will also be attached to the restricted

area. **THE RESTRICTED AREA IS TO BE UNDISTURBED**! Viz. picking, taking samples, or other disturbances within the restricted area are not permitted. The pit ID, depth to be considered, the number of horizons to describe, pertinent chemical data, and other relevant information will be displayed on a sign at each pit. Slope stakes will be placed along the grade for determination of slope and site position. Ninety minutes will be allowed for both the team-judged and individually judged profiles. There will be a strict rotation policy implemented for the competition pits, so that all teams and individuals have an equal and fair amount of time in front of the 'restricted area'. An example rotation schedule is presented below (after Azam et al, 2015):

Example of competition pit rotation. Teams and individuals will be split into two groups for the purposes of rotation.

Time (minutes)#	Group 1 (Teams 1, 2, 3)	Group 2 (Teams 4, 5, 6)
0 – 5	In*	Out*
5 – 10	Out	In
10 – 15	In	Out
15 – 20	Out	In
20 - 30	In	Out
30 - 40	Out	In
40 - 50	In	Out
50 - 60	Out	In
60 - 90	Free**	Free**

Time allocation may vary based on the final number of participating teams. Starting time may vary.
*In and out refer to competitors allowed in the pit or outside of the pit, respectively.
**During free time, all teams/competitors may have access to the pit.

Conduct of the Team Contest

Ninety minutes will be allowed for teams to evaluate each of the two sites and soils. The time at each pit will be divided into segments. Teams will be randomly assigned a team rotation number at registration. All competitors in a team may participate in the team contest.

The rotation policy as detailed above will apply. Competitors may obtain a sample from the surface horizon while out of the pit, provided they do not enter the pit or disturb those already in the pit. Team competitors will be assigned a number that will be used to identify their scoresheet, the rotation schedule and the pit profile face described. The procedures for student rotation and time in and out of the pit may be altered prior to the contest to meet unanticipated difficulties at the site or changes in competitor numbers (Official Handbook of the Inaugural International Soil Judging Contest, 2014).

General rules of the team contest:

- Team members are not allowed to speak to members of other teams but can talk within their team.
- Competitors are not allowed to communicate with their coach
- Competitors must use official abbreviations, as detailed in this handbook;
- Competitors are not allowed to use laptops, mobile phones, tablets, or other electronic devices.
- Competitors are allowed to use the equipment provided on site, and the allowed standards.

Conduct of the Individual Contest

Ninety minutes will be allowed for evaluating each site and soil for individual judging. Competitors will be assigned by team number to one of two groups at the pit and the soil pit will contain more than one restricted area (profile face). Each group will be assigned one of the profile faces to describe.

The rotation policy as detailed above will apply. Competitors may obtain a sample from the surface horizon while out of the pit, provided they do not enter the pit or disturb those already in the pit. Individual competitors will be assigned a number that will be used to identify their scoresheet, the rotation schedule and the pit profile face described. The procedures for student rotation and time in and out of the pit may be altered prior to the contest to meet unanticipated difficulties at the site or changes in competitor numbers (Official Handbook of the Inaugural International Soil Judging Contest, 2014).

General rules of the individual contest:

- Competitors must use official abbreviations, as detailed in this handbook.
- Competitors are not allowed to speak to each other.
- Competitors are not allowed to use laptops, mobile phones, smart phones; tablets, or other electronic devices, apart from handheld calculators.
- Competitors are allowed to use the equipment provided on site, and the allowed standards.
- Competitors are not allowed to communicate with their coach.

The winning team will be determined from the sum of the two team pits. The winning individual will be determined from the single individual pit. In the event of a tie in either team or individual competition, tie breakers will be used.