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Continuing ideas for exploring the environment in the 2023 International Year of Millets by Jeanie Clark

Isn't it great seeing the green of winter—especially when we have had ample rain in the shadow of an El Nino event? Do your science activities turn to the growth of plants at this time? Do your learners go into the garden to discover what is growing, or create experiments with plants? Do they observe and plan and research growing plants? Millets could be their focus for this 2023 International Year of Millets (IYM).

At the end of the previous article in this series [1], I suggested growing millet as a practical action for this IYM. This article follows on from that by suggesting some learning activities and resources related to growing millets, not just at the practical level but also as a base for science, planning and research skills. These suggestions could be applied to any plants.

Science-based activities

There are many science-based activities that can be explored as part of growing plants and/or experimenting with growing plants. Planning, research, literacy and numeracy all come into play: what to grow, when, where and how, preparing a site, fertilising, sowing, weeding and watering; and later, harvesting, storage and cooking, are all a part of plant-based activities.

Plants grown in the same soils in different pots can be used for science experiments to show the importance of various factors in their growth. The importance of sunlight to germination could be explored by growing one pot in shade, one in a dark cupboard and one out in the sun. A group of pots that are in the same location could be watered with different amounts of water, to find out what the plant prefers—more water is not always best! Other pots could have different types of clay/sand soil mixes, or varying inputs of fertilisers, and so on.

Whether observing plant growth or experimenting with it, a regular monitoring plan could be setup, e.g. daily or weekly. Learners could plan how to record and then collate their data—for example with tables, drawings, photos, graphs, charts, diagrams, or text (photographic records should be made from a fixed point so that the photos are accurately comparable).

Planning can also be made for reporting this science observation or experiment. What would it look like? Who might be interested in it? Online or in print, for example, in *Otherways*? Could it also be presented to inspire others? If so, how? If there is a regular photographic record, and learners have the IT skills, they might even collate it into a plant story.

What questions would learners be inclined to ask in their planning? Would they consider:

1) What garden tools are needed?

2) When to start and what happens when?
3) Where will the seeds come from? How many might be needed and what might they cost?
4) What are the soil, temperature, and rainfall needs of this plant? (Some examples were given in the previous article in this series [2].)

Where will your learners look for answers?

Seed sources

Sources of millet seed in Australia (question 3) and how to grow it can be found with a web search. In the previous article in this series, the *Australian Wheatgrass* website, based in NSW, was mentioned as a source of millet seed for sprouting [3]. Its millet page has useful planning information: how long it takes to grow sprouts ready for harvest and how far this is in the life cycle of the plant [4]. If the preference is to only grow to sprout stage and eat them, this website is also a source for sprouting equipment (question 1). Its Grow kits, sprouters& equipment webpage shows sixteen different products and describes the plants to which they are suited, along with their prices [5].

Gardener& Graziers, based on the Darling Downs in Queensland, also offers millet seeds for sprouting [6]. It too, has a choice of quantities and includes a list of information about millets, with a warning that if growing millet for human consumption, the husks need to be removed first. Sorghum, another millet plant, is also available [7].

NSW Riverina's Outback Harvest and Teff Tribe both offer brown and white teff seeds for sale in small quantities, and information on cooking—but not growing—seed or sprouts [8, 9, 10, 11].



Searching the web

Using the web to search for how to grow millet (question 2) is a little more complicated, because of the nature of search engines. Are your learners aware of how they work? A problem like the different names of millets limiting the finding of 'millet' was mentioned in my previous article, and similar term limitations may apply with other searches [2].

Do your learners vary their terms when searching? Do they look at the variety of websites suggested to see their differences, or only rely on the first listed? Do they look only at the suggestions on the first results page or do they go onto further pages? Do they make linked searches by changing the terms in their search? Are there good reasons to do any of this?

Are your learners aware of how search engines decide which results to display? If they haven't heard of 'algorithms', 'personalisation processes' or the 'filter bubble', now might be a good opportunity to explore these things. A good starting point for this is Eli Pariser's TED talk, Beware Online 'Filter Bubbles', or for a younger audience, GCF LearnFree's How Filter Bubbles Isolate You [12, 13]. For further discussion about the effects of personalisation, read Eli Pariser's book, or Tony Ziade's or Tanya Kant's websites [14, 15].

What guidance do you give your learners for how to choose the best results from a web search? Should they use one website, or collate information from a selection of pages? Content, readability and use of visuals vary. These affect what is suited to your learners, but there may be other considerations. Are your learners aware that if they prefer Australian information, they should look for '.au' in the website address? Should they look for trusted sources like Encyclopedia Britannica? Should they look for how recently a webpage was created or updated? Does the website's origin in a particular country or hemisphere matter? Are months or seasons used? And, if months, why should the location of the information be checked?

Websites for growing millet

Let's compare search results for 'growing millet' from my search engine. The *Millet Foundation* says, "Go to the field to broadcast seeds and then return after 3 months to harvest the grains" [16]. Is it really as simple as that? Well, yes, (look for where this website is based). But also, no, as the rest of the paragraph describes the conditions under which it is that simple. (Could your learners use this environmental information for experiments?)

The DPI website is brief and could be used as an introduction [17]. Dairy Australia has more detail and a higher reading level requirement, so is more suited to older learners [18]. Wikihow uses a series of clear diagrams with text that could be very helpful in planning growing [19]. How Stuff Works has a clear list as a cultivation guide [20]. (It could also be used to choose factors to plan experiments.) This was based on more detailed text at Heirloom Organics [21]. (This text could be used as a literacy exercise for learners to make their own summary list and compare it to the How Stuff Works one.) Agro-learner has lots of information that could be used for planning, including a seven-step guide to cultivation-and, for trustworthiness, there are details about the author's experience in growing millets in his notes [22].

Now, my web search did not return any results on the life cycle of millet, which could be a helpful planning resource. (What search terms would be more useful for that?) Life cycles are usually drawn in circular diagrams (e.g. from *Plantworld*) [23]. Timelines can show the same information, (e.g. the header of this article from *Dreamstime*) [24]. Which type of diagram is easier to understand? Should such diagrams have labels?

Web searches may also suggest videos. Videos can be valuable research aids for planning and they vary greatly. Farmer Plant has a five-and-a-halfminute video of millet, from sowing through growing [25]. DIY has a three-minute video showing how to sprout pearl millet [26]. Forty seconds into Planet Budgie's video of millet planting, it focuses on planning [27]. Agri-farming has a ten-minute spoken video, broken up into labelled sections, that not only covers the basic growing needs of millet and its harvest, but also its threats [28].

There is a lot to research. Your learner should be able to collate plenty of useful information for their



environment and their goals. Planning for growing or experimenting with millet can now be solidly based and full of potential for success. What a great science activity to participate in for the *International Year of Millets* over the coming months. May your plants grow well!

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Direct links to webpages in this article

[2] ibid, page 46.
[3] *Australian Wheatgrass, 2023* 'Sprouting seeds' at <u>https://australianwheatgrass.com.au/collections/sprouting-seeds</u>
[4] *Australian Wheatgrass, 2023* 'Millet Seeds' at <u>https://australianwheatgrass.com.au/products/millet-seeds</u>
[5] *Australian Wheatgrass, 2023*, 'Grow kits sprouters & equipment' <u>at https://australianwheatgrass.com.au/products/millet-seeds</u>
[5] *Australian Wheatgrass, 2023*, 'Grow kits sprouters & equipment' <u>at https://australianwheatgrass.com.au/products/millet-seeds</u>
[6] *Gardeners & Graziers, 2023*, 'Millet Seeds- in seed kits or single containers' at <u>https://www.gardenersandgraziers.com.au/millet-seeds /</u>
[7] *Gardeners & Graziers, 2023*, 'Sorghum Seeds- in seed kits or single containers' at <u>https://www.gardenersandgraziers.com.au/sorghum-seeds/</u>
[8] *Outback Harvest, 2023*, 'Brown Teff Seeds' at <u>https://outbackharvest.com.au/buy-teff/teff-brown-grain</u>
[9] *Outback Harvest, 2023*, 'White Teff Seeds' at <u>https://outbackharvest.com.au/buy-teff/teff-ivory-grain</u>
[10] *Teff Tribe, 2023*, 'A small grain that matters – Teff seed ivory' at <u>https://tefftribe.com.au/product/teff-seed-ivory-500g/</u>
[11] *Teff Tribe*, 2023, 'A small grain that matters – Teff seed ivory' at <u>https://tefftribe.com.au/product/teff-seed-brown-500g/</u> and *TeffTribe* seed packet picture at <u>https://tefftribe.com.au/wp-content/uploads/2022/01/We-are-</u>

constantly-getting-involved-in-amazing-new-adventures-with-teff-this-year-we-were-lucky-enough-to-be-a-partof-the-retreatyourself_box-22.png

[12] Pariser, E., 2011 'Beware Online Filter Bubbles' in *TED Talk* at <u>https://www.youtube.com/</u> watch?v=B8ofWFx525s

[1] Clark, J.,2023, 'Full of potential- IYM part 3', in Otherways, vol 176, May 2023, page 47.

[13] GCFLearnFree, 2019, 'How Filter Bubbles Isolate You' at https://www.youtube.com/watch?v=pT-k1kDIRnw [14] Ziade, T., 2023, 'The Filter Bubble Paradox: Personalization vs. Pluralism - Navigating the Divide Between Personalized Content and Diverse Discourse in the Age of AI', in *Shield Me* at https://shieldme.substack.com/p/ filter-bubble [15] Kant, T., 2016, 'How personalisation could be changing your identity online' in *the Conversation* at <a href="https://

[15] Kant, T., 2016, 'How personalisation could be changing your identity online' in the Conversation at <u>https://theconversation.com/how-personalisation-could-be-changing-your-identity-online-63217</u> [16] the Millet Foundation, 2020, 'Cultivating Millets' at <u>https://themillet.org/cultivating-millets/</u>

[16] the Millet Foundation, 2020, 'Cultivating Millets' at <u>https://themillet.org/cultivating-millets/</u> [17] DPI, NSW, 2023, 'Native Millet' at <u>https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/</u> species-varieties/native-millet

[18] Dairy Australia, 2023, 'Millet and Sorgham' at <u>https://www.dairyaustralia.com.au/feed-and-nutrition/growing-</u> feed-for-the-herd/summer-cropping-options/millet-and-sorghum

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 [20] Contributors, 2023, "How to Grow Millet" in How Stuff Works at <u>https://home.howstuffworks.com/how-to-grow-millet.htm</u>

[21] *Heirloom Organics*, 2019, 'How to Grow Millet' at <u>http://www.heirloom-organics.com/guide/va/</u>guidetogrowingmillet.html

[22] David, 2023, 'How to grow Millet (Beginners Guide)' at Agro-learner at How to Grow Millet [Beginners Guide] - Agrolearner https://agrolearner.com/how-to-grow-millet/

[23] Plantworld, 2021, 'A growth cycle of a millet plant on a white background' in *Designbundles.net* at https://designbundles.net/plant-world/1310524-a-growth-cycle-of-a-millet-plant-on-a-white-backgr
 [24] Kharzhevska, N. H., ID 152482991, (royalty free), 2020, in *Dreamstime.com* at https://disabultaction.com

thumbs.dreamstime.com/z/cycle-growth-millet-plant-white-background-beautiful-illustration-152273856.jpg [25] Farmer Plant, 2022, 'Millet plant day by day' at <u>https://www.youtube.com/watch?v=spKL6C3gbjk</u> [26] Samathareddy, 2020, 'How to grow Pearl millet sprouts easily' in *DIY* at <u>https://www.youtube.com/</u>

watch?v=uEdZa6kXX4E&t=177s [27] Planet Budgie 2020 'How to Grow Millet in Garden' in DIY at https://youtu.be/Fwz29-iELKw

[28] Agrifarming, 2021, 'How to grow millets' at https://www.youtube.com/watch?v=E1FQ3QcWHR4
 [29] FAO, 2022, IYM logo, in International Year of Millets Trello board at https://trello.com/c/t816XAtu/11-twitter-covers