



Photograph by Ninjatacoshell CC BY-SA 3.0 license

Root nodules



Muck heap



Cows grazing on grass



Harvested grass for silage

Further information can be found on web sites such as the National Farmers Union (NFU) <http://www.nfuonline.com> and Countryside Classroom <https://www.countrysideclassroom.org.uk> or by searching 'microbes in agriculture'.

For an opportunity for schools to receive NFU materials, see entry form (over page).

Metabolism, medicines & muck: how microbes help farming

Aim of the competition

To increase an understanding among teenagers of the benefits of microbial activities in agriculture.

Background

The many ways in which microbes contribute to the success of agriculture are not widely understood and appreciated. Do you know that without microbes, the farming industry would be in danger of collapse? This is because of the extent to which the activities of microbes such as fungi, bacteria and viruses influence both the quantity and quality of our food. Most of these microbes cannot be seen by the naked eye but their activities are constantly taking place within soil, plants and animals. For example, they influence how plants take up nutrients, especially nitrogen, they help to keep animals healthy and they have important roles in recycling waste materials into useful products.

Object of the competition

You are required to produce a poster aimed at teenagers that will provide a better understanding of the ways in which microbes are of benefit to agriculture. For the purpose of this competition, the only microbiological effects you need to consider must be in processes that are associated with the **three areas** that are listed below. Some examples of the processes associated with them are also provided.

- **Soil fertility and plant health & growth:** e.g. nitrogen cycle, mycorrhiza, biological control of pests.
- **Animal health and growth:** e.g. vaccination, antibiotics, digestion in the rumen, silage making.
- **Waste management:** e.g. composting, anaerobic digestion (biogas), muck spreading, deep litter system.

Format of entries

Your poster must be on one A3 sheet of paper as hard copy (or two A4 sheets *secured side-by-side with adhesive tape*), prepared by computer or hand, and on only one side of the paper. The entry may be created by either an individual student or a group of not more than 4 students.

It should give an overview of the ways in which microbes are involved in farming by illustrating at least **three processes**, either selected from any of the 11 examples provided previously or others of your own choice which must be within the **three areas** listed previously. You should include the scientific basis of the processes, the formal name (genus and species) of at least **one** of the microbes involved, and other relevant and interesting information, e.g. the importance or contribution of the process. Because part of the judging of the posters will be on their scientific content as well as their clarity and design, you should consider the inclusion of photographs, drawings, data and sources of further information. Use your own words because plagiarism will be penalised.

What makes a good poster?

Posters rely on their immediate and visual impact. Therefore:

- use small amounts of text and short, clear sentences that the reader, i.e. a teenager, will quickly understand;
- use font sizes that can be read from at least 1 metre away;
- avoid using too many colours & combinations which make words hard to read.

And remember how attractive and informative a lively and well-designed presentation can be.

Closing date 8th April 2019

Prizes

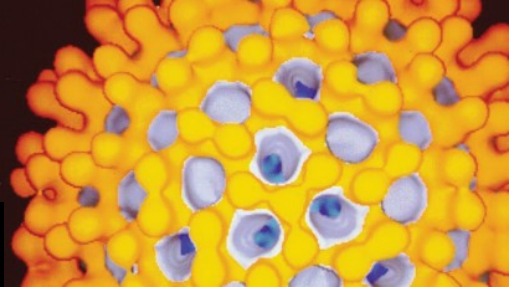
Schools	1st £250	2nd £125	3rd £70
Students	1st £100	2nd £50	3rd £25

A certificate will be awarded to each student submitting an entry of scientific merit. Each school will also receive a report of the competition and some educational teaching materials. The results and winning entries will be published on www.misac.org.uk and the NFU educational page.

Sponsor of the 2019 competition



National Farmers Union



Promoting microbiology in schools and colleges since 1969

Rules

- Judging will be based on two entry groups: Key Stage 3 (S1/2) and Key Stage 4 (S3/4).
- Each entry must be submitted on paper, on **one A3 sheet** (or two A4 sheets taped together) using one side of the paper only, and may be produced either by hand or by computer.
- Entries may be created either by individuals or groups of no more than 4 students.
- A maximum of 10 entries per school in each entry group is permitted.
- Account will be taken of originality, presentation and effectiveness in communicating with the intended audience.
- Only entries that conform to the competition rules and show scientific merit will be considered; note the requirements and consider the suggestions given on the front page.
- Evidence of plagiarism, such as downloading text directly from web sites without modification and interpretation, will result in disqualification. (MiSAC recommends only reputable sites for research; see www.open.ac.uk/webguide for tips on using the internet.)
- Each entry must be clearly labelled on the back with the name and address of the school, the teacher's name, the full name of each contributing student and the entry group, i.e. Key Stage 3 or S1/2 and Key Stage 4 or S3/4.
- Entries cannot be returned and may be used for promotional purposes by MiSAC and the competition sponsor.

Closing date 8th April 2019.

Check list for teachers

Please tick before submitting entries

- Students' name/s on entry? []
- School name on entry? []
- School address on entry? []
- Teacher's name on entry? []
- Key stage on entry? []
- Entry form completed? []
- I wish to receive free resources and opportunities from the NFU []

Sponsor of the 2019 competition



Entry form *

Name of teacher:

Tel no:

Email:

Name and address of school

.....

.....

.....

KS3, S1/2 entry group

Name(s) of student(s)

1

2

3

4

5

6

7

8

9

10

KS4, S3/4 entry group

Name(s) of student(s)

1

2

3

4

5

6

7

8

9

10

How did you learn of the competition? *Please tick*

[] MiSAC web site [] NFU web site [] Post to school [] Emailing [] Social media [] Other

Don't forget to keep a copy of the rules and entry form!

** Personal data for use only by MiSAC in connection with the MiSAC Annual Competition*