Ash Die Back in West Lothian 2021-24

1. Method

The progression of ash die back disease has been monitored in West Lothian through repeated surveys throughout the county. This year sites were resurveyed that had previously been surveyed in 2021. While West Lothian Council has begun to remove some diseased ash trees within the county, no work had yet been carried out in the survey areas, and no trees surveyed in 2021 had been removed.

Surveys took place in summer months, mainly July and August, and sites were resurveyed at approximately the same time of year to reduce potential variability caused by the changing seasons. Results were recorded on Treeplotter.

Trees were classified based on the cover of foliage in the canopy, as suggested by The Tree Council[1] and widely adapted as a system of monitoring ash decline. 4 classes are used based on the canopy, described below:

- Ash Health Class 1 (Good) > 75% Canopy
- Ash Health Class 2 50% - 74% Canopy
- Ash Health Class 3 25% - 49% Canopy
- Ash Health Class 4 (Poor) < 25% Canopy

When analysing the data, total number of trees in each classification were compared, as well as the change in condition class (e.g. improving from Class 2 to Class 1, or declining from Class 3 to Class 4).

2. Results

2.1. Climate

There were some differences in rainfall and temperature that may have influenced tree condition. The summer months in 2024 were colder and wetter than average. According to weather records from World Weather Online[2], average monthly temperatures for Livingston in July were 16°C in 2021, 13°C in 2024, compared to a long-term average of 16°C. Total rainfall from April-June was 65.3mm in 2021 and 102.5mm in 2024. The long-term average rainfall for this period is 65.8mm.

2.2 Categories of survey

Surveys were categorised by the location of trees into open space, road, play parks and school. The majority of trees surveyed (72%) were road side.

2.3 Total number of trees within each condition class

A total of 5170 trees were resurveyed. These were surveyed in 2021 and then again in 2024. A further 1300 were surveyed for the first time in 2024. There was an increase in trees classified in each class from 2021-2024, as shown in Figure 1. This may just be due to a larger number of trees being surveyed in 2024. However, in 2024, a larger number of trees were classified as class 4 than those classified as class 3.

[1] https://treecouncil.org.uk/wp-content/uploads/2019/12/Suffolk-Canopy-Description.pdf
[2] https://www.worldweatheronline.com/livingston-weather-averages/west-lothian/gb.aspx

The percentage of trees in class 4 (Poor) increased from 7% of all the trees surveyed in 2021, up to approximately 16% in 2024 (Figure 2). Trees classified as class 1 (Good) also decreased from 52% to 42%, and suggests a general decline in condition over the three-year period.

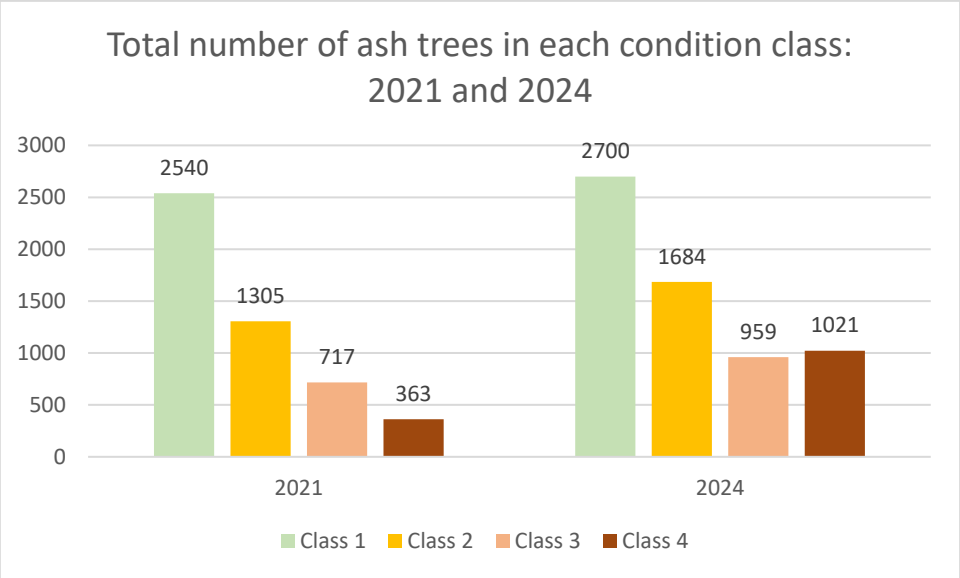

Figure 1 - Total number of ash trees in each condition classification from 2021-24

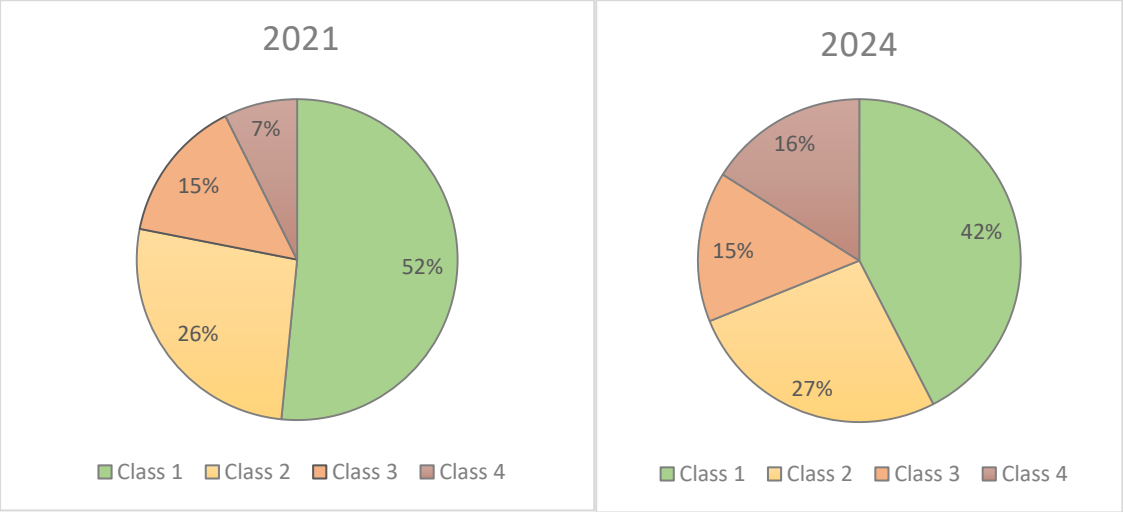

Figure 2 - Percentage of trees within each category from 2021-24

2.4 Change in condition, 2021-24

Of the total trees surveyed in 2024, 66% showed no change between 2021 and 2024, 26% had declined and 8% had improved (Figure 3).

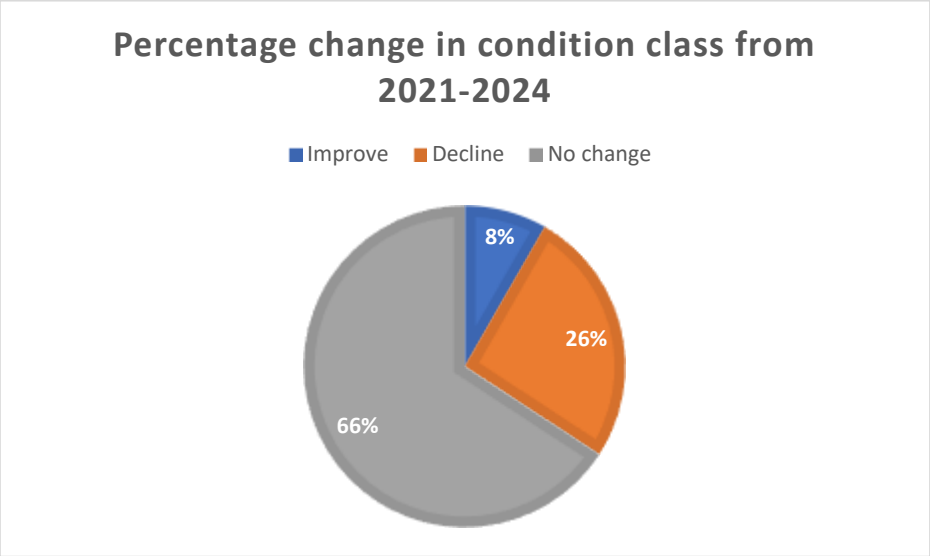

Figure 3 - Percentage change in condition of ash trees, 2021-24

2.5. Changes within each condition class

The change within each class was examined from 2021 to 2024, based on how the trees were classified in 2021. For example, within trees originally classified as class 1 in 2021, the percentage of trees that declined from 2021-24 was calculated.

It appears that the majority of trees that were class 1 in 2021 were still class 1 in 2024, as shown in Figure 6. This suggests some ash trees trees may have some resistance to ash die back disease. 25% of trees that were class 1 in 2021 had declined by 2024.

Trees in poorer classes showed greater rates of decline. 33% of trees that were class 2 declined by 2024 (Figure 7), and the same percentage (33%) of trees that were class 3 also declined (Figure 8).

Some trees seem to have improved over time, with 15% of class 2 trees improving and 19% of trees in class 3 improving from 2021-24. 16% of trees that were originally class 4 also appeared to have improved. It is possible these trees are recovering, and supports the findings of other studies which have also shown that infected ash trees may improve over time[3]. These results may also be due to errors in recording, differences in recording between different surveyors, or the impacts of changing weather conditions.

[3] https://treecouncil.org.uk/wp-content/uploads/2020/06/Tree-Council-Ash-dieback-tree-owners-guide-FINAL.pdf

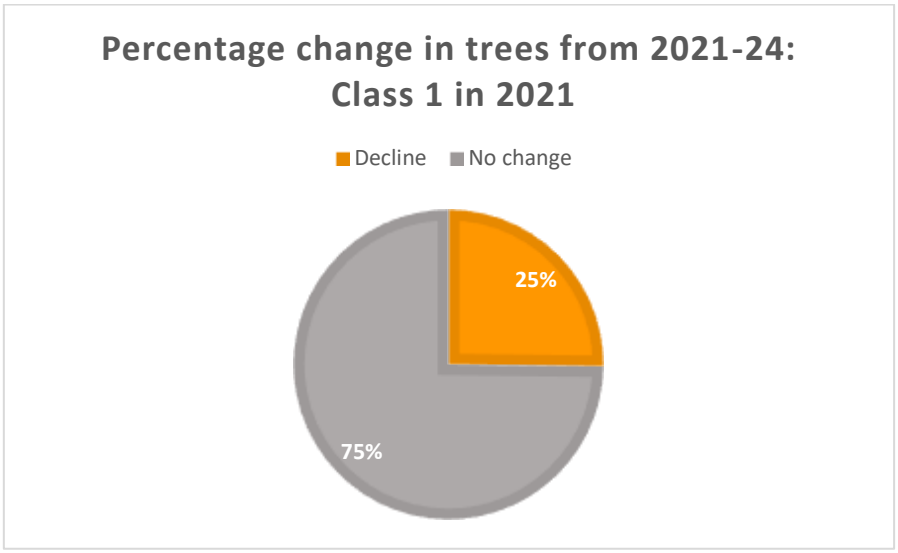

Figure 4 – Percentage change in condition from 2021-24 in trees originally classified as Class 1 (Good)

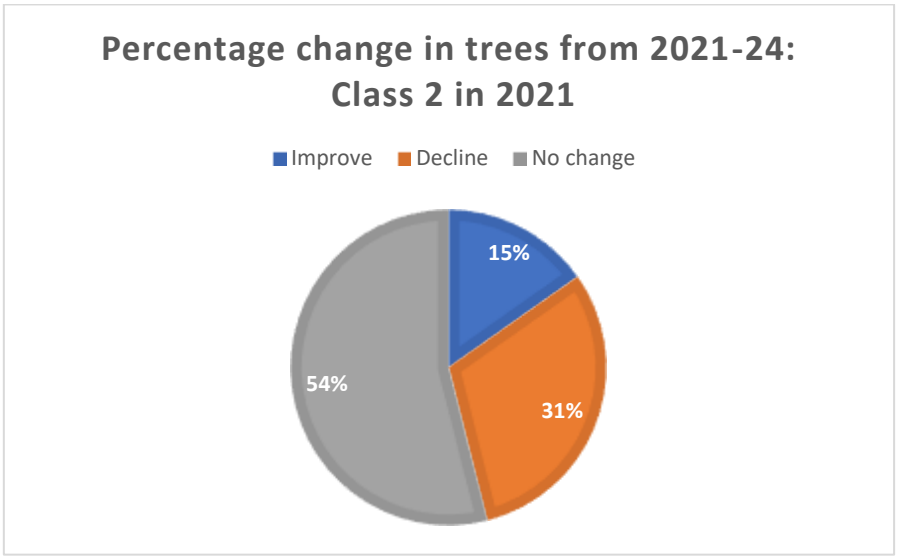

Figure 5 – Percentage change in condition from 2021-24 in trees originally classified as Class 2

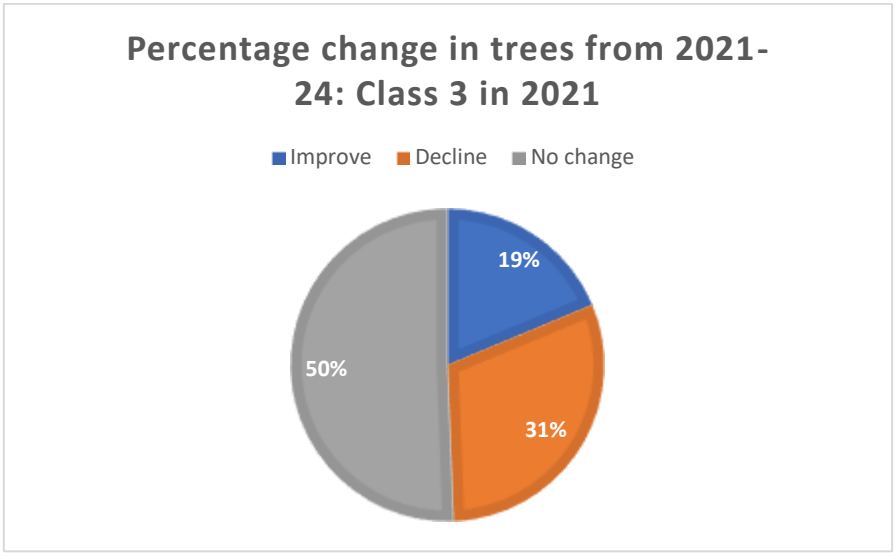

Figure 6 - Percentage change in condition from 2021-24 in trees originally classified as Class 3

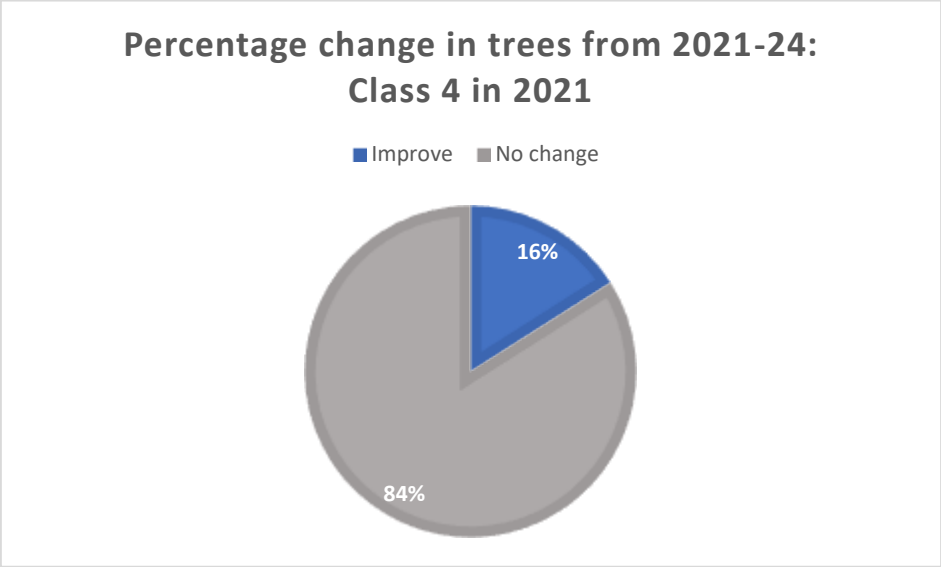

Figure 7 - Percentage change in condition from 2021-24 in trees originally classified as Class 4 (poor)

2.6. Tree size and changes in condition

Observations from West Lothian and elsewhere suggest younger ash trees are more severely affected by ash die back than older trees. To test this, the classification of the trees in 2024 was compared against the diameter at breast height (DBH). For each condition class, the percentage of trees within each DBH range was calculated, i.e., how many class 1 trees had a DBH of 0-20cm.

Looking at both class 1 and class 2 trees, the percentage of trees within each DBH class is approximately the same (Figure 10). In class 3 the percentage of trees with DBH of 0-20cm increases to 49% and this increases further to 65% of trees in class 4 having a DBH of 0-20cm. This does suggest that smaller and younger trees are more vulnerable to ash die back.

Another approach to this data is to examine the total number of trees within each DBH range that were classified into each condition class (Figure 12). 661 trees were found to be class 4 on trees with DBH of 0-20cm, compared with 267 with DBH of 21-40cm and only 28 trees with DBH > 60cm.

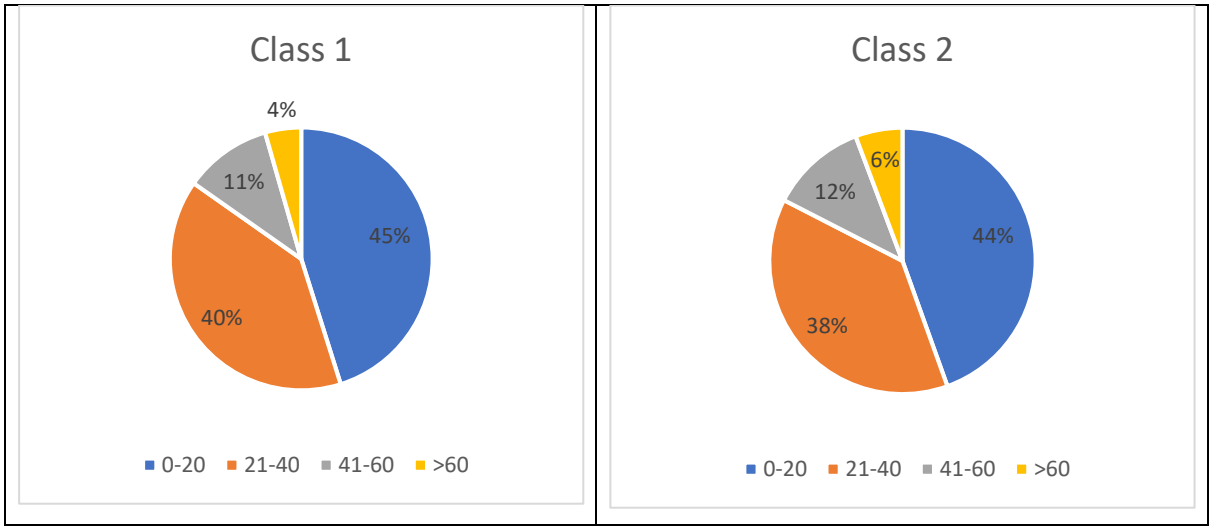

Figure 8 - Percentage of trees within each DBH range (cm) for trees of Class 1 and Class 2 in 2024

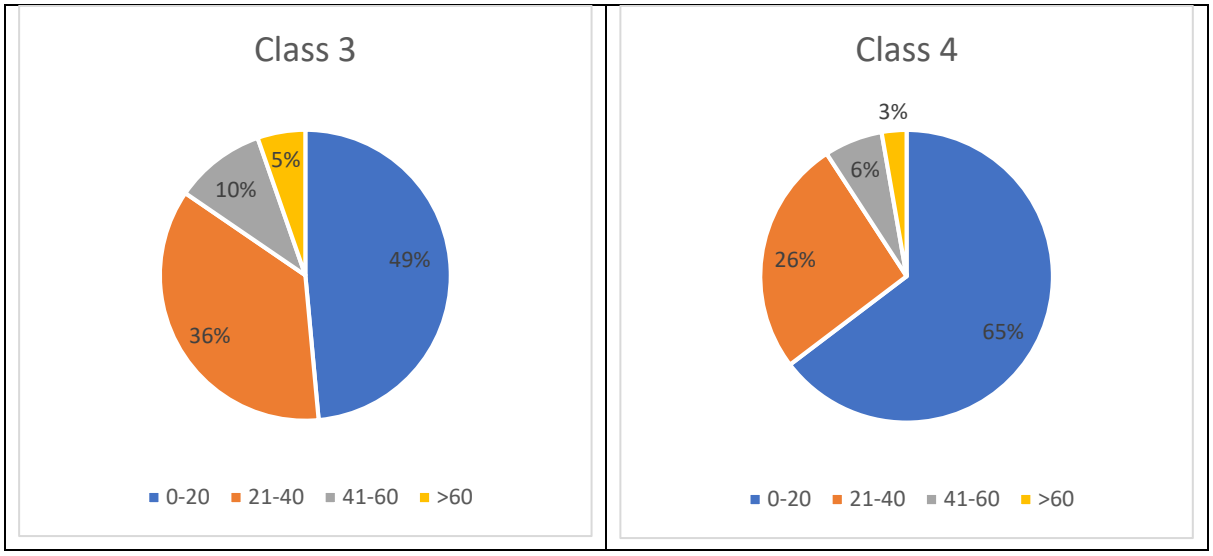

Figure 9 - Percentage of trees within each DBH range (cm) for trees in Class 3 and 4 in 2024

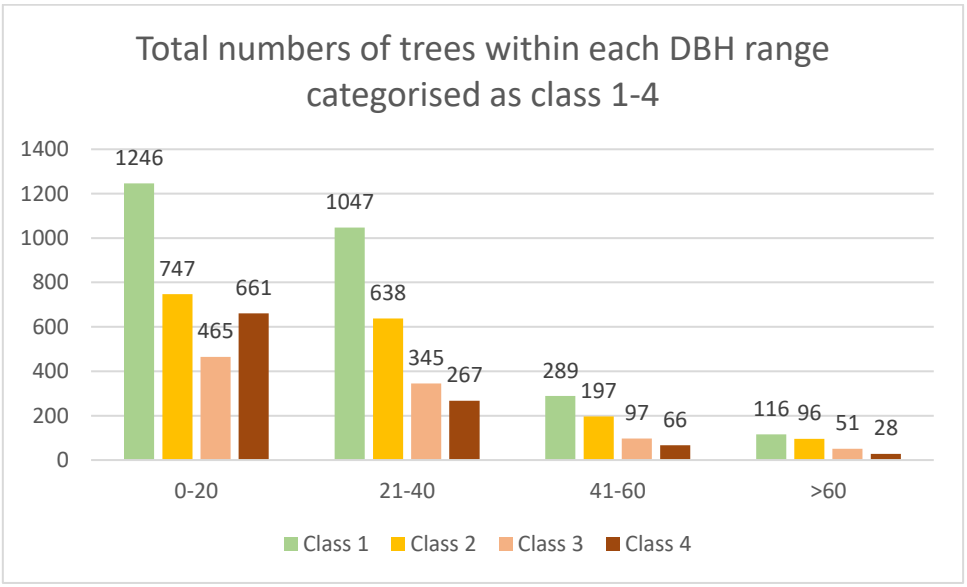

Figure 12 – Total numbers of trees within each DBH range (cm) that were categorised in each condition class in 2024

3. Summary

The progression of Ash Dieback Disease is being monitored in West Lothian using repeat visits to the same trees in a number of sites in the county. The data collected from 2021-24 was examined for potential changes in condition. Over the three years approximately a quarter (26%) of the trees surveyed had declined from 2021-24.

The data show an increase in the number of trees classified as Class 4 (poor condition) from 2021 to 2024, rising from 7% in 2021 to 16% in 2024 supporting the observation that trees are declining within the county. This is similar to findings from last year, which also showed an increase in trees at class 4, although in 2023, 30% of ash trees were identified as class 4.

Trees that were class 2 or class 3 in 2021 seemed more likely to decline than a tree that was class 1 in 2021. There was a 33% decline from class 2 and 3, versus a 25% decline from class 1 (good condition). This does suggest some trees do have some resistance to the disease, but as the disease progresses it probably causes more damage to the tree making recovery more challenging. A number of trees also showed improvement, so ash trees may be able to recover form ash die back. It is possible that errors or differences in surveying could have influenced these results, as well as differences in weather conditions.

There were a larger number of trees with DBH of 0-20 categorised as class 4, compared to trees with DBH of greater than 60cm. This suggests smaller and younger trees are more vulnerable to the disease.

The results show that ash die back continues to cause significant problems to ash trees in West Lothian and suggest that approximately a quarter of trees with the disease are likely to continue to decline in the near future.

Caroline Freeman
Assistant Tree and Woodland Officer
West Lothian Council
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