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The Common House Mouse, Australia's Most Detrimental Pest

A current and large impact topic is the house mice infestation in Australia. This issue is currently very severe, there are a record number of population estimates and new news stories being released constantly. This issue became popular among agriculture issues in 2021 and is still a topic of discussion this year. The Australian government has made the common house mouse one of its top priorities when it comes to invasive species. In past years, the severity of this issue has been less but this year because there is abundant food available the population of mice is rising rapidly.

As of right now, the trends are worsening, the population of mice is growing and so are their impacts. In years prior Australia went through fires and droughts making for an abundant production season with the heavy rainfalls this year. Looking at a larger trend, Australia sees the mouse population rise and fall through the years. The mice infestation isn't a new problem, but right now it is at one of its peaks (VICE).

One of the main impacts on the trend of the mice population rising and falling is the production of agricultural crops. If it's a high production year, there is lots of food available for the mice and the mice reproduce quicker in a more favorable environment. With so many mice needing homes and food they can quickly be very detrimental to agriculture production.

This topic mostly affects the rural populations of Australia. Those who live out in the country have a lot of mice living in the fields around their home. And if they are farmers, the mice are eating and decimating their crops and harvests. This indirectly affects the urban populations through supply and pricing. During big population booms, mice have also been known to be a problem within grocery stores, which can affect both populations of rural and urban people. This issue overall affects men and women the same as this is a country where both parties can share the same general responsibilities. But it can pose an extra hazard to children because the country as a whole is using more rodenticides and that can be dangerous for children if they come in contact with it. This is not to say that chemicals are not potential threats to adults, especially to the worker applying the chemicals, but that children are the most at-risk group should they be affected.

This outbreak of house mice has had a huge impact on the environment of Australia and the native species. The mice are eating more food than the native animals could be eating and they can possibly be carrying diseases that can harm the native animals. There is also a growth and snake populations as they are feeding on the mice and when the mice population drops back down, these snakes will need to eat something else, which will then be the native species and have a detrimental effect that way also.

As this is a problem Australia has never really been able to solve, they as a country have implemented some management procedures. One thing Australia tells its people to do is track the mice population growth. They suggest ways to approximate how many mice are in a hectare and use the numbers to

determine the severity of a mouse population outbreak (AGRICULTURE VICTORIA). As a Country, they have tried things from treating the crop seeds that are being planted to prevent mice to mowing and burning large grass areas to limit food and habitat for mice. There are some people in Australia that have taken it upon themselves to deal with the mice problem also. Some people have set up traps that will drown the mice. Others have taken it as far as burning living mice. Most people, especially in the rural areas, have cats and dogs who are trained to catch mice. All of these have problems as they do not deal with the entire population of the mice especially when there is a population boom or they have larger consequences, such as the chemicals being used can be harmful to the environment.

Based on what the country of Australia has been able to do, it is shown that preventative management works best to keep the house mouse numbers from getting out of control. When they try to kill the mice after they are reproducing, especially when the population is big enough to be deemed a plague, there's not much that can be done to minimize the effects on the mice. It is hard to say what could be improved upon because Australia has already tried many things to deal with these mice and nothing has completely worked. One of the best things to do though would be to make sure that what they are doing is being implemented in as large of an area as possible. This will mean the impact and results are also larger.

Infestation of mice is not anything new. Many countries have faced this problem before as mice are very adaptable to many climates and have a broad palate. Some countries have done things such as introducing other species to manage the species that are invasive (Witmer). This doesn't always work, and if it does sometimes the introduced species does too well and also become invasive and does more harm than good. Typically introducing a new species is not considered the best thing to do as it is disrupting the natural ecosystem even more. Some countries have done other things such as trapping invasive animals or chemically spraying invasive plants. There are also things that have been done to limit the habitat of invasive animals, but this is risky as it can affect the negative ones as well. Scientists have been able to successfully engineer some mosquitoes to be infertile, which is a newer option for management (Tasoff).

Many tactics for managing invasive species either do not have a large enough effect, or they result in worse unintended consequences. Integrated pest management (IPM) is a recommendation for how to manage pests in a way that is least harmful to the environment (U.S. Environmental Protection). When countries with large pest problems start at the safer end of this spectrum it often takes more effort, trapping compared to poisoning for example needs many different levels of attention and equipment and labor to run. The environment is not facing greater negative impacts, but it takes much more time and effort to lower the invasive populations. Countries who choose tactics on the higher end of the IPM scale can often remove a large chunk of the harmful species but they risk hurting native populations and in some cases, the pest can build up tolerances to the control methods. Countries that use multiple management tactics often see the best results because they are hitting the pest in multiple weaknesses at once.

Something similar to what was done for reducing the mosquito population could be replicated for the common house mouse, genetically engineering some house mice to be infertile and releasing them into the infected area. This solution will likely be the most effective in the future, but its positive factor is also its weakness. As it will take time and therefore also money, to develop, it will not be beneficial to present-day Australia. Once the mice are released the process will be slow, it will take time for the genes

to be spread to a majority of the population and for results to be seen. This slow process will be beneficial for the natural ecosystem, it will allow for a slower more natural recovery and will not introduce any additional problems. But it will still not be a fast-acting improvement for the agriculture industry.

The country may benefit from investing in large-scale live traps for mice. These can be designed in a variety of ways, and different styles can be used depending on the location and situation. Some ideas could include the use of spinning dowels and one-way trap doors that can drop the mice into containers. These designs are used with smaller traps but could be scaled up. This would have a slightly faster and larger effect on the infestation but would not be such a drastic and sudden solution. Mice would be caught without harm and would again give the ecosystem time to bounce back. The mice would be contained and could not reproduce in the wild or die and creating the potential for rot and disease where humans may be put at risk. It is important to mention that this plan does have some glaring drawbacks, including the maintenance of such traps. There would be a large need for labor and materials to build and maintain these traps. Both of which could easily turn into a huge money pit. Not to mention that even though the mice are being humanly detained, the mice would need to be moved, and no matter if the mice were then 'kindly' put to rest or kept alive they would still be a nuisance to dispose of simply because there are so many of them at this time. And even though mice are being caught there would still be enough hiding away to multiply and continue the destruction. Overall this idea is good at first glance but is not worth the number of resources it would take to ensure this plan was effective.

Another band-aid type solution that would limit annoyances at a surface level but not have a large impact on the overall problem would be encouraging all homes to store items in glass, especially food. A second level to implementing small-scale, non-harmful preventive measures is the use of mouse replants. Homeowners can invest in natural repellents that are less dangerous to the wanted residents, and drive the invaders away. This will help to keep pests from eating and nesting in homes which will limit the chances diseases are spread to humans. It is not a watertight solution though. Not all households could easily purchase all new storage containers, so a government or local support program may be advised. The mice will simply be repelled and the chances of contained food sources are limited. This is always positive, but with an outbreak of this level, it will not do much to save citizens from the rodents.

Each of the solutions that I proposed, genetically engineering infertile mice, setting large-scale live traps, and reconstructing how goods are stored have their pros and cons. Implementing just one solution would not be enough to solve the problem, especially one of this severity. But by implementing these solutions into the process the government already has in place there is a better chance of limiting the effects and growth of the mice population.

I would recommend the committee in Australia that has been making decisions thus far meet again and discuss these solutions in their plan. They have already approved the increase in rodenticides used by agriculture producers and have a clear understanding of the problem. They make a public announcement describing their new plans and recommendations (AGRICULTURE VICTORIA). They would need to find a way to humanely kill and dispose of any mice that they catch and make efforts to encourage people to clean up the dead mice for sanitary reasons. Perhaps the mice could be burned. While they are implementing these procedures work can be started to genetically engineer infertile mice and research the

highest population areas to release them. All efforts to stop the mice population from growing are important but without large impact plans, the problem will continue.
The committee may also seek advice from the native Australians as they have likely had to find ways to handle or at least minimize the impacts of the mice within their communities. Playing off of this idea further, this committee needs to schedule regular meetings with province representatives and even the citizens themselves, of the area most impacted. This will not only assure the people that their government is taking action, but it may also provide an opportunity for another solution to be brought before the committee so that all possible options are explored.

As the Australian Government is already putting in efforts to stop the mice problem, the Australian government could fund these additional solutions themselves. If these projects work and the mice population is reduced to a manageable number the government would no longer have the financial burdens of the damage caused by the mice and the cost of their management. This country is considered developed by the United Nations (World Economic Situation). With the strong position of the government and a country-wide plague of mice, it would be in the government's best interest to put all allotted resources into solving this problem.

As a whole the people of Australia all want the house mouse eradicated. Many people, if given the proper guidance, would most likely do everything they could to help lessen the effects of the mice, such as switching to glass containers. This may not be feasible for all people, but those who have not done it and have the ability most likely would. The government and the committee elected to help stop the problem would take some of the steps I listed earlier and could work closely with farmers who are implementing the greatest amount of the practices. They could track what management technique is working best and how it is affecting the mice.

There would need to be limited methods so that they do not get out of hand and deal even more damage to the native ecosystem. And there would need to be clear procedures in place so that things are not only done safely but also in a consistent way that has the most impact on the problem. As Australia is a developed country and has strong systems of legislation and communication it will be considerably simpler to implement these changes compared to the abilities of other countries.

The people of Australia want these rodents gone. There is a history of hunting these mice or people taking matters into their own hands to kill the mice. It is safe to say that everyone is for removing these nuisances, but there may be debates over the most ethical way to do so. People may not want to see the mice killed in a cruel way and others might oppose any methods that may pose a risk to the native flora and fauna, so these concerns need to be taken into account.

Parts of this project once developed should last through multiple seasons as the country works to limit its problem. The glass containers, traps, and even data from the genetically engineered mice can be kept and reused as the problem is being dealt with. But some of the work going into those ideas would need to be repeated. The rodenticides and removal of possible habitats for mice are not very sustainable, they would need to be implemented often and may harm the natural ecosystem. But with the correct balance of each of these solutions, Australia may be able to handle their house mouse infestation.

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