

# AJASN AGRI – Newsletter

April 2017

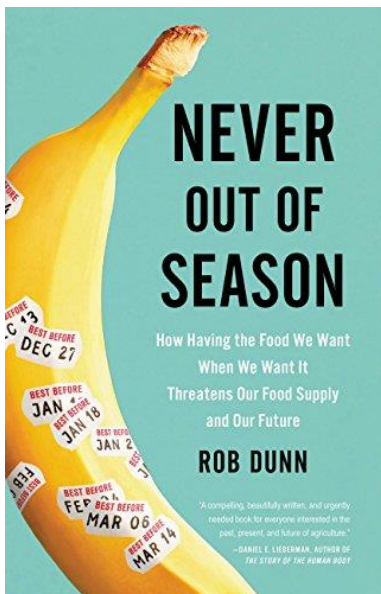
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This readable [book](#) emphasises the importance of plant diversity in fighting drought, parasites and pathogens (book [excerpt](#)).

## Public policy, public sector (& related)

An interesting New Zealand discussion about how [water policy](#) should deal with water exported in bottles differently than water used to raise dairy cows (or in farming), if at all. This [article](#) says we should tax meat (animal products) produced with the use of antibiotics. This [article](#) discusses how and why to tax meat (in the UK) and the broader, growing push for a meat tax. (See books on p. 3 for related thinking.)

A [new take](#) on the 'resource curse' says it's not so simple - natural resources influence how institutions are built. Easy to extract resources are more likely to be wasted, hard to extract are more productively invested.

This [Victorian audit](#) shows that planning schemes have mixed success in achieving the intent of State policy across three areas - developing activity centres, increasing housing density, diversity and affordability, and protecting valuable agricultural land. This [study](#) (explained [here](#)) reviewed 94 studies of how sustainability policies had failed across every continent. Three types of failure keep recurring: economic, political and communication. '... economic failures stem from the basic problem that environmentally damaging activities are financially rewarded.' 'Political failures happen when governments can't or won't implement effective policies.' 'Communication failures centre on poor consultation or community involvement in the policy process.'

The Food Agility Co-operative Research Centre ([here](#)) was set up. The Productivity Commission [isn't convinced](#) about the idea of using departmental relocation as a form of regional aid. (See [here](#) too.) This [article](#) describes programs that help build small diversified farm businesses in three US states.

The OECD published a [report](#) on 'Agricultural Policies in Costa Rica.'

## Farming

An [article](#) from the EU asks: What if intensification of farming could enhance biodiversity? A [report](#) by the UN Special Rapporteur on the right to food focused narrowly on agricultural chemicals, presented to the UN Human Rights Council, says it is a myth that we need pesticides to feed the world. This [paper](#) reviews trends in herbicide use in genetically engineered and non-engineered crops, and toxicity levels of herbicides. Herbicide use is going up in both, faster in non-GE crops.

A [paper](#) says plants growing in warmer conditions are tougher and have lower nutritional value to grazing livestock, potentially inhibiting milk and meat yields and raising the amount of methane released by the animals. At a recent Seattle Mariners vs Astros baseball game six kilos of [spicy grasshoppers](#) (on the menu) sold out.

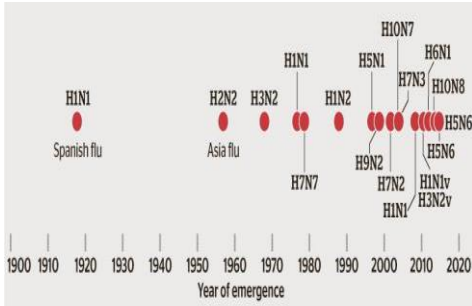
An [article](#) on controlled environment agriculture ('space-farming') for human space exploration that relates some of this work to technology transfer which proves valuable here on Earth. There are articles on [Fitbit farming](#) (for sheep) and [desert moisture](#) farming and on '[Green collar work](#).'

Researchers find that a strain of leptospirosis may be more frequent in NZ [dairy herds](#) than first thought, posing public health concerns for farmers, veterinarians and dairy workers.

American farmers are circumventing John Deere's restrictions on their farm equipment (to assert a [right to repair](#) equipment they buy.) Some farm states are proposing related laws.

This [article](#) discusses Chile's salmon farming industry and the problems it faces (over use of antibiotics and chemicals, and consequent sales losses.)

## Ecosystems



This [infographic](#) shows the likelihood of flu pandemic increasing as new strains emerge.

New Zealand's growth, based largely on exploiting natural resources, is starting to show its environmental limits with increasing greenhouse gas emissions and water pollution ([OECD finding](#).) The [Atlas for the End of the World](#) audits the status of land use and urbanisation in the most critically endangered bioregions on Earth.

In the coming years, water scarcity is likely to become Asia's defining crisis ... ([source](#)) Global use of non-renewable groundwater is exhausting the supply so fast that it will drive up food prices and hit international trade, according to a [new study](#). Plants have the ability to detect and respond to sounds to [find water](#).

The mountains of non-organic waste (trash) people produce are forming a new geological / [technofossil](#) layer.

A U.S. government [program](#) designed to convert farmland to wildlife habitat has triggered the spread of a fast-growing weed (Palmer amaranth or pigweed) that is very destructive. It is spreading fast in Iowa (and the Midwest.) A new type of [life cycle assessment](#) includes land use change. This [review paper](#) argues the benefits of ecological intensification in agricultural production.

An [article](#) discusses using environmental DNA (eDNA) for biodiversity assessment as a new tool for conservation (and the search for the Loch Ness monster.)

This [report](#) says manure from cattle administered antibiotics drastically changes the bacterial and fungal make-up of surrounding soil, leading to ecosystem dysfunction. A [new report](#) looks at how microbial ecosystems and climate change interact – impacts in three areas were discussed – terrestrial polar regions; soil, agriculture, and freshwater; and oceans



This is a link to an interesting [interactive data visualisation](#) that shows mergers and acquisitions in seed companies.

## Climate

A new [study links](#) India's water crisis to the impact of climate change, which has weakened recent monsoons. This article discusses some of the implications of [glacier melting](#) (e.g. urban water supplies connected to the Tibetan Plateau) and shows some before and after (time lapse) photographs of the melt. This [study](#) discusses how a melting glacier leads to first modern 'river piracy.' An [analysis](#) says climate change is reshuffling the ranges of animals and plants around the world with significant consequences for human well-being. This (South African) [study](#) shows an interaction between climate change fire disturbance showing flammable ecosystems may be particularly sensitive to climate change.

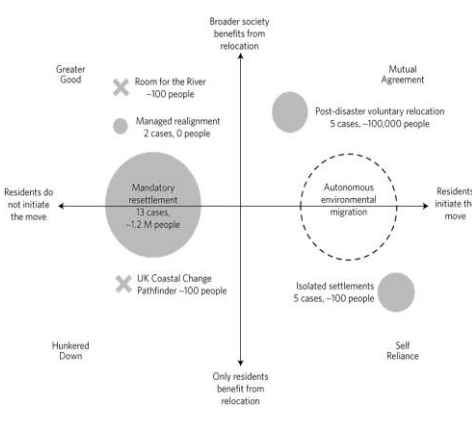
This study suggests [deaths related to extreme heat](#) are expected to keep rising (particularly threatening to large cities.)

Take a look at [Climate Lab](#) a new video series that explores the behavioral science of climate change and attempts to mitigate it, is a smart idea for a series. A new University of Illinois [study](#) puts climate change predictions in terms that farmers are used to: field working days ([journal article](#).) Workable days will determine the cultivars, the cropping system, and the types of pest management practices you can use.

This [study](#) found rearranging the menu in favor of vegetarian food has a large and significant effect on the willingness to order a vegetarian dish instead of meat. A [related study](#) shows displaying healthy items to the left and unhealthy items to the right enhances preference for the healthy options. In addition, consumption volume of a healthy item (vis-à-vis an unhealthy item) is higher when it is placed to the left (vs. right) of the unhealthy item.

A [report](#) concluded that while climate change does not directly lead to the emergence of terrorist groups, it creates the conditions in which they can thrive (hunger, drought and poverty.)

This set of [policy scenarios](#) looks at the risk of overinvesting vs. underinvesting in carbon-free electricity (depending on whether climate policy is weak or stringent.) The risk of underinvesting is greater.



This image is from an article on one adaptation to climate change – managed retreat (Hino et al. 2017). A larger version of the diagram is [here](#).

## Health

Malaysian authorities [raised an alert](#) for a northeastern state after the virulent H5N1 bird flu virus was found to have spread to poultry in more villages (in March.) The last decade has seen an accelerating number of [flu strains](#) infecting humans; the reasons are unclear (e.g. better detection, animal management practices, ecological change ... future engineered viruses ...) The World Health Organization has published its first ever list of 12 potentially deadly [antibiotic-resistant superbugs](#). A protein (urumin) found in Indian frog mucus secretions, has a knack for taking down H1 flu viruses, a [new study](#) finds. Norway plans to exterminate a large reindeer herd to stop a fatal infectious brain disease ([chronic wasting disease](#).) Blood-sucking flies can act as 'flying syringes' to detect emerging infectious diseases in wild animals before they spread to humans, [research](#).

A [special supplement](#) on animal health was published, open access online, in Nature.

This [study](#) looks at which livestock production claims matter most to consumers. Elevated carbon dioxide [in confined pig farms](#) may worsen dust-induced lung problems in farm workers.

People living in areas that restrict [trans fats in foods](#) had fewer heart attack and stroke hospitalisations than areas where no restrictions exist. Tweaking the design of vending machines -- this [work](#) found if you have to wait for unhealthy snacks longer (25 second delay) than healthy snacks at a vending machine, you choose healthy snacks. Drinking at least one [artificially sweetened beverage](#) daily was associated with almost three times the risk of developing stroke or dementia (compared to once a week) and a related [study](#). This [study](#) sets out a roadmap for successful obesity prevention for each jurisdiction in Australia. Japan's school [lunch program](#) is described here (food is sourced from local farmers or grown by the school – lunch is part of the curriculum.) [FishChoice](#) provides users with the means to minimise their exposure to chemical pollutants from eating seafood, while helping them ensure nutrients, such as fatty acids, are still consumed.

## Science & technology

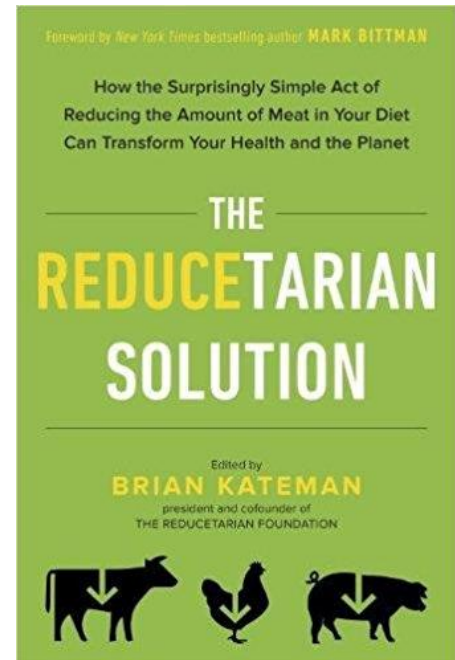
Japanese researchers [created seedless tomatoes](#) by gene editing; the resulting plants don't require pollination, which means that they could be grown in areas where (pollinating) insect life fails. [Gene editing](#) differs from genetic modification – so should it be regulated?

A study shows that future [improvement of fishing technology](#) poses a threat for the global fishery that could be greater than climate change.

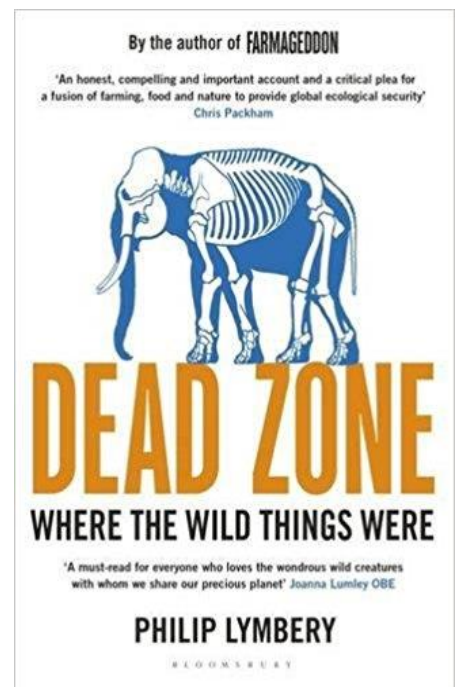
[Impossible Burger](#) production – a plant-based meat designed to look and taste good enough that meat eaters will want to order it is scaling up production in the United States. By the end of the year, the company expects to supply 1,000 restaurants (currently at 11.) Researchers have invented [virtual lemonade](#) that could one day allow people to digitally share drinks over the internet.

An [algorithm](#) based on the social behaviour of bee colonies, which allows them to attack in an optimal way, could help dismantle social networks linked to organised crime, jihadist terrorism, or facilitate the design of vaccination strategies capable of containing the spread of a pandemic.

A [paper](#) in Science Advances says the most-cited papers rely on a specific mix of old and new research that is nearly universal in all branches of science and technology i.e. show an understanding of the entire arc of an idea.



Read an interview with the book author [\(here\)](#).



This [book](#) looks at the toll of intensive farming (e.g. cheap meat) on the environment and wildlife.

## Assumptions

This [paper](#) found no support for the popular idea that high biodiversity should not be expected to lead to more infectious diseases of humans. In contrast, there is now substantial evidence that high diversity protects humans against the transmission of many existing diseases.

This [study](#) looked at infectious disease outbreaks – animal societies that are highly fragmented experience smaller but longer disease outbreaks because disease spread in these populations gets trapped in local communities.

A [study](#) (in France) demonstrated that low pesticide use rarely decreases productivity and profitability of arable farms (and [here](#).)

## Forward 'looks'

The CEO of America's biggest meat processor is betting on a meatless future (Tom Hayes of Tyson Foods) believes [plant-based 'meats'](#) have a place on future kitchen tables.

No new [coal-fired plants](#) will be built in the EU after 2020.

Mergers and takeovers could reshape the [global agricultural chemical](#) business, reducing competition in the industry with China set to be an important player.

## News

Sir Richard Branson [suggested](#) New Zealand farmers should grow cannabis instead of expanding dairy operations. In April the Canadian government introduced legislation to legalise recreational use of marijuana by July 1, 2018 (but it's up to the provinces to implement.)

Brazil's [meat inspection system](#) is in trouble – with tainted meat being exported because meat inspectors accepted bribes.

New Zealand's postal service delivers KFC now – it hopes chicken deliveries will help it offset [major losses](#) in letter traffic.

An [urban agriculture](#) district with vertical farming, floating greenhouses and algae tanks will be built in Shanghai starting this year. Here is an [article](#) on the future of agriculture (urban, high-tech) in the United States.

The BBC asked 50 science and technology experts about the biggest challenges facing humanity. This is the [first article](#) in a month long series.

China's first official [pork-price index](#) is up and running.

[Ikea](#) has turned food into one of its fastest-growing segments and might open city centre stand-alone cafés.

## Useful websites and resources

The cool cows website offers suggestions about dealing with heat stress <http://www.coolcows.com.au/>.

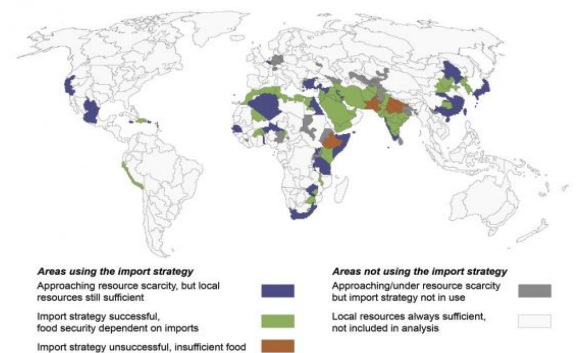


Here is a farmer's message in advance of 2017 presidential elections in France. [Source, here](#)

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*Food tech ... "Investors are very intrigued by businesses that combine the one-time sale of hardware that ends up leading to repeat purchases of consumable packages." ([Source](#)) ... but it's easy to be 'tempted to have a technology angle when it's not really there' ...*

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Global food import strategies discussed in this [paper](#). Researchers' bottom line: when population pressure increases, food is imported.

## Upcoming meetings

**Next meeting** 9-10 August 2017