



Australian
Competition &
Consumer
Commission

Statement of Issues

3 November 2016

Proposed merger of The Dow Chemical Company and E.I. Du Pont de Nemours and Company

Purpose

1. The Dow Chemical Company (**Dow**) and E.I. Du Pont de Nemours and Company (**DuPont**) propose to merge (the **proposed merger**). Both Dow and DuPont produce agricultural products such as crop protection chemicals and seeds, and a range of non-agricultural materials. Following the proposed merger Dow and DuPont plan to convert the merged entity into three separate companies focusing on agriculture, materials science and speciality products respectively.
2. This Statement of Issues:
 - gives the Australian Competition and Consumer Commission's (**ACCC's**) preliminary views on competition issues arising from the proposed merger
 - identifies areas of further inquiry
 - invites interested parties to submit comments and information to assist our assessment of the issues.

Overview of ACCC's preliminary views

3. The legal test which the ACCC applies in considering the proposed merger is in section 50 of the *Competition and Consumer Act 2010*. Section 50 prohibits mergers or acquisitions that would have the effect, or be likely to have the effect, of substantially lessening competition in any market.
4. The ACCC divides its preliminary views into three categories, 'issues of concern', 'issues that may raise concerns' and 'issues unlikely to raise concerns'. For this matter there are four 'issues that may raise concerns'.

Issues that may raise concerns

- **Innovation in crop protection:** the proposed merger may lead to a substantial lessening of competition in upstream markets for the development of new technology for crop protection products. Both Dow

and DuPont are leading innovators in crop protection products and the removal of competition between them may lead to less innovation across a broad spectrum of products. In the longer term, this could lead to a reduction in the rate at which new products come to the market. It could also reduce quality and/or increase prices for crop protection products.

- **Chewing and sucking pest insecticides:** the proposed merger may lead to a substantial lessening of competition in certain markets for the supply of insecticides, particularly in relation to certain chewing and sucking pests. Dow and DuPont produce certain products which compete closely, based on active ingredients including, but not limited to, Rynaxypyr and Cyazypyr (DuPont) and Sulfoxaflor and chemicals in the Spinosyns class (Dow). The removal of this competition may lead to higher prices for these patented insecticides.
- **Canola seeds:** the proposed merger may lead to a substantial lessening of competition for the development of new varieties of canola seeds for the Australian market. Dow and DuPont are both important global suppliers involved in seed research and development. A removal of competition between them may result in a slower pace of development of canola seeds.
- **Materials science:** the proposed merger may lead to a substantial lessening of competition in markets for the supply of ionomers, acid co-polymers, and potentially other materials science products. Outside of Dow and DuPont it appears that there are few competitors currently supplying or offering to supply ionomers and acid co-polymers in Australia.

Making a submission

5. The ACCC is seeking submissions from interested parties, particularly on the following key issues:
 - whether, by reducing the number of firms investing in research and development, the merger would lessen the pace of innovation to bring new crop protection products to the Australian market
 - whether Dow's and DuPont's insecticide products are close substitutes to each other, and whether other competitors have products that could be suitable substitutes if the merged entity raised the prices of its insecticides
 - whether, if the proposed merger did not proceed, there would be greater competition to develop new seed varieties, and improvements in the rate at which new varieties are brought to the Australian market
 - the impact of the proposed merger on the supply of materials science products in Australia, particularly the supply of ionomers.
6. Detailed discussion of these and other issues, along with specific questions, is contained in this Statement of Issues.
7. Interested parties should provide submissions by no later than 5pm on 24 November 2016. Responses may be emailed to mergers@acc.gov.au with the title: *Submission re: Dow and DuPont - attention Jason Byrne and Andrew*

Gallagher. If you would like to discuss the matter with ACCC officers over the telephone or in person, or have any questions about this Statement of Issues, please contact Jason Byrne on (02) 6243 1279 or Andrew Gallagher on (02) 9230 9129.

8. The ACCC anticipates making a final decision on 2 February 2017, however, this timeline can change. To keep abreast of possible changes in relation to timing and to find relevant documents, interested parties should visit the Mergers Register on the ACCC's website at www.accc.gov.au/mergersregister.

Confidentiality of submissions

9. The ACCC will not publish submissions regarding the proposed merger. We will not disclose submissions to third parties (except our advisors/consultants) unless compelled by law (for example, under freedom of information legislation or during court proceedings) or in accordance with s155AAA of the *Competition and Consumer Act 2010*. Where the ACCC is required to disclose confidential information, the ACCC will notify you in advance where possible so that you may have an opportunity to be heard. Therefore, if the information provided to the ACCC is of a confidential nature, please indicate as such. Our [Informal Merger Review Process Guidelines](#) contain more information on confidentiality.

About ACCC 'Statements of Issues'

10. A Statement of Issues published by the ACCC is not a final decision about a proposed merger or acquisition, but provides the ACCC's preliminary views, drawing attention to particular issues of varying degrees of competition concern, as well as identifying the lines of further inquiry that the ACCC wishes to undertake.
11. A Statement of Issues provides an opportunity for all interested parties (including customers, competitors, shareholders and other stakeholders) to ascertain and consider the primary issues identified by the ACCC. It is also intended to provide the merger parties and other interested parties with the basis for making further submissions should they consider it necessary.

Timeline

Date	Event
18 July 2016	ACCC commenced review of the proposed merger
5 August 2016	Closing date for submissions from interested parties
25 August 2016	Former proposed decision date of 15 September 2016 delayed to allow provision of requested information
19 September 2016	ACCC timeline recommenced
25 October 2016	Former proposed decision date of 27 October 2016 delayed at the request of the merger parties so that

Date	Event
	they can provide further information to the ACCC
3 November 2016	ACCC publication of Statement of Issues
24 November 2016	Deadline for submissions from interested parties in response to this Statement of Issues
2 February 2017	Anticipated date for ACCC final decision

The parties

12. Dow is a global diversified chemicals company which supplies plastics, chemical products, agricultural sciences products and hydrocarbon and energy products. Currently its operations are split across five segments including agricultural sciences, performance materials and chemicals, and performance plastics. In 2015 Dow generated approximately US\$49 billion (A\$66 billion) in global sales revenue. Dow's Australian revenue was approximately A\$515 million in 2013/14.
13. DuPont is a global science and technology company which supplies a variety of chemical products, electronics, polymers, agro-chemicals, seeds, food ingredients and other materials. Currently its operations are split across six segments including agriculture, electronics and communications, industrial biosciences, and performance materials. In 2015 DuPont generated approximately US\$25 billion (A\$33 billion) billion in global sales revenue. DuPont's Australian revenue was approximately A\$390 million in 2013/14.

The proposed transaction

14. Following the proposed merger the parties plan to convert the merged entity into three separate companies focussing on agriculture, materials science and specialty products respectively.
15. The agriculture company will focus on the production of seeds and crop protection chemicals, including herbicides, insecticides and fungicides. Globally the combined revenue for the merger parties in agriculture was approximately US\$16 billion (A\$21 billion) in 2015.
16. The materials science company will focus on performance plastics, various performance materials (including polyurethanes and co-polymers), materials for automotive manufacture and maintenance, various coating materials and materials for consumer and pharmaceutical products. Globally the combined revenue for the merger parties in materials science was approximately US\$46 billion (A\$62 billion) in 2015.
17. The specialty products company will focus on electronic materials (including semi-conductors, display technologies and materials for the production of circuits), protective materials, food solutions and ingredients, and industrial bioscience. Globally the combined revenue for the merger parties in specialty products was approximately US\$12 billion (A\$16 billion) in 2015.

18. In addition to the ACCC review, the proposed merger is also being reviewed by competition regulators in many other jurisdictions including the European Union, the United States and Canada.

Industry background

Crop protection

19. Crop protection products are chemicals that play a role in controlling the diseases, insects and weeds that harm or destroy food crops. Broadly, crop protection products can be categorised as herbicides, insecticides, fungicides and other products. Herbicides are used to prevent or reduce the growth of weeds. Insecticides are used to control insects that damage plants. Fungicides are used to control plant diseases caused by fungi. Other products include molluscicides, which target snails and other molluscs, plant growth regulators and seed care products.
20. Crop protection products are characterised by:
 - One or more **active ingredients**: these are the chemical compounds which are designed to treat a targeted pest (fungi, insects or weeds). Each active ingredient belongs to a chemical class.
 - A **mode of action**: this is the way that a specific cellular process in a pest is inhibited by the active ingredient.
 - A **formulation**, which is the formula containing the active ingredient, or mixtures of more than one active ingredient.
21. Formulated crop protection products can come in various forms, including liquids for spraying, or soil fumigants.
22. Effective resistance management is an important consideration when selecting crop protection products. Active ingredients are classified into groups according to their mode of action. Resistance management strategies include avoiding repeated use of chemicals from the same mode of action group.
23. CropLife International is a body which (among other things) classifies crop protection chemicals into groups according to their mode of action. For insecticides, CropLife International maintains classifications through its Insecticide Resistance Action Committee (**IRAC**). This statement refers to IRAC's mode of action groups when discussing particular crop protection chemicals.
24. Developing new active ingredients for crop protection products is expensive and time consuming. This involves a process of researching, testing and screening potential compounds, developing a selected compound into an economically viable product and obtaining necessary regulatory approvals. It can cost hundreds of millions of dollars and take a decade or more to develop a new active ingredient and bring it to market. In Australia, crop protection active ingredients and chemicals must be approved and registered with the Australian Pesticides and Veterinary Medicines Authority (**APVMA**) before they can be used.

25. Crop protection products are produced by both “originator” and “generic” companies. Dow and DuPont are both originator companies. Originator companies invest in research and development to develop new active ingredients, for which they can then obtain a patent. Generic producers do not typically conduct research into new active ingredients but produce formulated products based on off-patent active ingredients.
26. The following table provides a summary of the major originator companies which supply crop protection products in Australia, other than Dow and DuPont. For reference, in 2015 Dow generated approximately US\$6 billion (A\$8 billion) in global agricultural sciences sales revenue. In 2015 DuPont generated approximately US\$10 billion (A\$13 billion) in global agriculture sales revenue.

Table 1: Originator suppliers of crop protection products in Australia other than Dow and DuPont

Name	Description
Syngenta	<p>Syngenta manufactures and distributes crop protection products and seeds globally. Syngenta focusses on crop protection products for cereals, corn, field crops, rice, soybean, speciality crops, sugar cane and vegetables. Syngenta is headquartered in Basel, Switzerland. In 2015 it generated approximately US\$10 billion (A\$13 billion) in global crop protection sales revenue.</p> <p>ChemChina, which owns the majority of Adama (a supplier of generic crop protection products), has announced a proposal to acquire Syngenta, subject to regulatory approvals. The ACCC is reviewing this transaction.</p>
Bayer	<p>Bayer operates globally across sectors such as crop science and healthcare. In Australia, Bayer Crop Science supplies a range of crop protection products and seeds. Bayer is headquartered in Leverkusen, Germany. In 2015 it generated approximately €8 billion (A\$12 billion) in global crop protection sales revenue.</p> <p>Bayer has announced a proposal to purchase Monsanto, subject to regulatory approvals. The ACCC will commence a public review of the transaction when a submission is received.</p>
BASF	<p>The BASF Group operates globally across sectors such as chemicals, plastics and crop protection. BASF Australia supplies a range of crop protection products and seed treatments. BASF is headquartered in Ludwigshafen, Germany. In 2015 it generated approximately €6 billion (A\$9 billion) in global agricultural solutions sales revenue.</p>
Monsanto	<p>Monsanto is a global supplier of agricultural products including crop protection products and seeds. In Australia Monsanto supplies products to the cotton, grains and horticultural industries including Roundup branded herbicide products. Monsanto is headquartered in St Louis, USA. In 2015 it generated approximately US\$15 billion (A\$20 billion) in global sales revenue, including US\$5 billion (A\$6 billion) from crop protection products. As noted above, Bayer proposes to acquire Monsanto.</p>

Sumitomo Chemicals	Sumitomo supplies a range of products including petrochemicals, materials, health and crop science and pharmaceutical products globally. In Australia Sumitomo supplies crop protection and various pest control products. Sumitomo is headquartered in Tokyo and Osaka, Japan. In 2015 it generated approximately ¥345 billion (A\$4 billion) in global health and crop sciences revenue.
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27. The following table provides a summary of the major generic companies which supply crop protection products in Australia.

Table 2: Generic suppliers of crop protection products in Australia

Name	Description
Adama	<p>Adama manufactures and distributes mostly generic agrochemical crop protection products, including in Australia. Adama is headquartered in Tel Aviv, Israel and is 60 per cent owned by ChemChina. In 2015 it generated approximately US\$3 billion (A\$4 billion) in global sales revenue.</p> <p>As noted above, ChemChina proposes to acquire Syngenta subject to regulatory approvals. Separately, ChemChina also proposes to acquire the 40 per cent of Adama that it does not already own.</p>
FMC	FMC is a global chemical company which supplies products ranging from generic agriculture products to health and nutrition products. In Australia FMC supplies a range of crop protection products. FMC is headquartered in Philadelphia, USA. In 2015 it generated approximately US\$2 billion (A\$3 billion) in global agriculture sales revenue.
Nufarm	Nufarm is an Australian-based agricultural chemicals company which sells generic crop protection products globally. In Australia Nufarm has an extensive network of regional service centres. In 2015 it generated approximately A\$3 billion in global sales revenue, of which approximately 22 per cent is from sales in Australia and New Zealand. Nufarm also owns Nuseed, a global seed business.
Sipcam Oxon	Sipcam Oxon describes itself as a global leader in the manufacture of generic farm chemistry. Sipcam is a privately owned company headquartered in Milan, Italy. Sipcam supplies a number of crop protection products in Australia. In Australia Sipcam operates in cooperation with minority shareholders Sumitomo and Nihon Nohyaku (which also produce crop protection products).
UPL	UPL is a global generic agrochemical company. In Australia it supplies a range of crop protection products. In addition to fungicides, insecticides and herbicides, UPL also supplies fumigants and termiticides. UPL is headquartered in Mumbai, India.

28. The types and mix of crop protection products used in Australia may differ compared to other countries. This is driven by the particular characteristics of Australian agriculture. For example, Australia is a major producer of wheat whereas the top three crops by volume worldwide are sugar cane, maize and rice. Other major crops produced overseas such as soybeans are produced in relatively small quantities in Australia. Australian agricultural businesses also spend much greater amounts on herbicides than insecticides and fungicides.

Distribution of crop protection products

29. Originator and generic suppliers do not generally supply crop protection products directly to farmers. Instead they each rely on retailers or other intermediaries to distribute their products. Major distributors of agricultural chemicals in Australia include Landmark, Ruralco, Elders and AgLink. Each of these has a number of retail shopfronts throughout Australia. Several smaller retailers also exist, with some having a retail presence in one or a few towns.
30. The ACCC understands that some distributors retail agricultural chemicals under agency agreements with suppliers, including Dow and DuPont. One of the issues the ACCC is considering is whether the merged entity would be able to restrict competitors' access to the retail distributors/intermediaries. Further discussion on this issue is at paragraphs 90 to 91 below.

Seeds

Seed development

31. The development, or breeding, of new seed varieties is a process where breeders develop plant varieties that are adapted to perform strongly in specific growing conditions. Once developed, the plant varieties are produced on a commercial scale. Seed breeding is an area that is changing as a result of new technologies enabling faster development of new traits and varieties. The public sector has previously had a strong role in some of these areas but its role is now much more limited.
32. Breeders begin the process by undertaking research programs designed to enhance the natural characteristics of plants according to the local soil type, climate and locally prevalent diseases. This is a lengthy process, which can take a decade or more, and requires breeding and trialling across many generations of the plant.
33. Once successful seeds have been developed, production begins in commercial quantities. The seed is then purified, sorted, treated with seed treatment products, and packed for distribution. The commercialisation of new seed varieties may be undertaken by the breeder itself, or it may license the variety to a third party.

Canola seed supply in Australia

34. Canola seeds is an area of focus for the ACCC's review. In Australia, companies undertaking canola seed development and production include Dow (which recently announced that it was involved in the development of new canola varieties), DuPont (which recently sold the production side of its business, but retains its seed research and development functions), Nuseed (a subsidiary of

Nufarm), Pacific Seeds (owned by Advanta Seeds), Bayer Crop Science and Cargill.

35. The canola varieties offered by these suppliers generally have one of several common herbicide resistant traits. Triazine tolerant and imidazolinone tolerant traits are common traits which were developed using conventional methods (i.e. without genetic modification). Since the mid-2000s usage of genetically modified germplasm has also become common. These include Monsanto's Roundup Ready (tolerant to glyphosate) which is licensed to several seed suppliers for use in their seed varieties, and Bayer's InVigor (tolerant to glufosinate ammonium). The ACCC understands that genetically modified varieties now account for around 25 per cent of Australian canola crop.

Materials science

36. Materials science products include a broad range of products, materials and chemicals that are derived from petrochemical products.
37. Dow produces a variety of materials science products including:
 - performance plastics (including hydrocarbons and specialty plastics and packaging materials, e.g., polyethylenes, adhesives, elastomers)
 - performance chemicals
 - materials for automotive systems and maintenance
 - infrastructure materials (including coating materials, electrical and telecommunications solutions, and elastomers)
 - materials for consumer products and devices.
38. DuPont produces performance materials which includes plastic science solutions and certain specialty co-polymers.
39. Other major producers of materials science products include ExxonMobil and Ineos.

Issue that may raise concerns: innovation in new chemicals for crop protection

40. Based upon its inquiries to date, the ACCC's preliminary view is that the proposed merger may substantially lessen competition in global markets for the development of new chemicals for crop protection products.
41. As discussed above, the merger parties are two of a small number of originator companies involved in the development of new chemical compounds that can be patented and used in crop protection products. The other major originators are Bayer, Syngenta and BASF. Monsanto and Sumitomo also develop new crop protection chemicals, but on a smaller scale (Monsanto has a greater focus on seeds).
42. There are other smaller companies which also engage in research and development activities. These include companies based in Japan such as Nihon

Nohyaku, Ishihara Sangyo Kaisha (**ISK**) and Mitsui Chemicals. However these companies do not necessarily engage in development and registration of new products outside of Japan. In many cases, they develop products in co-operation with the originators listed in Table 1 above. It appears that most of these companies are not currently supplying crop protection products in large volumes in Australia. The ACCC is continuing to investigate the potential constraint posed by these companies.

43. Innovation by originator companies helps end users of crop protection chemicals. Innovation produces new products with benefits over existing products, such as better effectiveness against pests, especially if pests have developed resistance to chemicals already in use. New products may have other improvements such as a reduced environmental impact, lower residual traces of the products on the crops, and easier or less frequent applications.
44. Originator companies engage in innovation to win access to new revenue streams, protected by patents, at the expense of the existing products of their competitors. The more competitors are engaged in such innovation, the more each will need to develop better innovations to capture revenue streams from their rivals.
45. With fewer originators, there may be a weaker incentive to innovate. For an originator with few competitors it is more likely that its innovation will cannibalise sales of its own patented products. There will also be less chance that a rival will develop a competing product ahead of the originator's own product. In contrast, for an originator with many competitors, a new product is more likely to win sales from its rivals rather than cannibalising its own sales. Therefore a potential effect of a merger between two originators (such as Dow and DuPont) is to reduce the rate of innovation by lessening competition between originator companies.
46. Barriers to entry into innovation markets are high. As mentioned above, developing and marketing a new active ingredient can cost hundreds of millions of dollars and take a decade or more.
47. Most research and development activity related to crop protection products occurs outside Australia. However, a reduction in innovation would affect the Australian crop protection market by lessening the rate at which new products come to the Australian market and benefit Australian growers.

The ACCC invites comments from market participants on these issues. Please respond to the following questions.

- To what extent do you consider Dow and DuPont compete against each other to develop innovative crop protection products? Are they closer competitors to each other than other originator companies?
- Are there any specific areas of crop protection products in which Dow and DuPont are particularly innovative?
- If Dow and DuPont merged, do you expect the rate at which new crop protection chemicals were developed would change? How?
- Do you consider the proposed merger raises any Australia-specific issues relevant to innovation in crop protection products?

Issue that may raise concerns: insecticides to treat chewing and sucking pests

48. In addition to a loss of innovation in crop protection products generally, the proposed merger has the potential to affect competition between pesticides that are already on the market. The loss of competition arising from the proposed merger may provide the merged entity with the ability to profitably increase prices in relevant pesticide markets.
49. Having reviewed the product portfolios of the merger parties, and conducted market inquiries, the ACCC's preliminary view is that there is potential for competitive harm in relation to certain patented insecticides in which Dow and DuPont overlap. The ACCC has not yet reached a concluded view on defining the relevant markets in which these products compete. However, it is unlikely that the relevant market is as broad as all insecticides. Rather, relevant markets will cover the parties' product, if they are close substitutes for each other, and other insecticides which are also close substitutes. The degree of substitution between products depends on the use to which they are put, as discussed further below.

Sales of insecticides in Australia

50. Dow and DuPont have both submitted that they have less than 10 percent of total Australian insecticide sales by volume. By value, Dow has estimated its sales at 10 to 20 per cent and DuPont at still less than 10 per cent.
51. The ACCC considers that these shares are likely to significantly understate the competitive tension between Dow and DuPont for a number of reasons:
 - Dow and DuPont are originators with a particular focus on products with active ingredients protected by patents, whereas some other suppliers are more focused on generic insecticides. The figures above are diluted by the inclusion of generic insecticides.
 - The relevant product markets are likely to be much narrower than a broad market which includes all insecticides. The degree of competition will be stronger between competitors that have close substitute products.
 - The merger parties are likely to have significantly higher shares in certain more narrowly defined markets relevant to their overlapping products. The ACCC has not reached a concluded view on market definition, but the potential for close competition between Dow's and DuPont's insecticides is discussed below.

Substitution between different products/categories of product

52. The ACCC's analysis of substitution between insecticides has sought to identify how the products are used by farmers. This includes several factors, such as:
 - the pest targeted
 - the crop for which protection is sought
 - the stage of the life cycle of the pest at which protection is required

- the stage in the growing season at which protection is required
 - the growing conditions in which the insecticide will be applied (soils, climate etc.)
 - the application method of the insecticide to the crop (e.g. as a foliar spray, soil or seed treatment)
 - the effect of the insecticide on beneficial insects (such as bees)
 - consideration of environmental impact, health and safety and residues remaining on the crop after treatment.
53. Resistance management and treatment rotation cycles are also relevant. This includes avoiding repeated use of chemicals from the same mode of action group.

Generic and on-patent insecticides

54. Price is a key consideration for farmers choosing insecticides. However, innovative products protected by patents generally command a price premium over more established generic products, indicating farmers will pay more if justified by the effectiveness or other characteristics of the product.
55. Market inquiries suggest farmers value modern, patented insecticides because of the benefits they provide. Farmers who need a patented insecticide may not necessarily switch to inferior chemicals if faced with a 5-10 per cent increase in price.
56. The significant price premium on modern chemicals indicates that cheaper generic products based on off-patent chemicals are often not likely to be an effective substitute. There can, however, be some substitutability between some generic and on-patent insecticides if each performs a similar function. Each needs to be considered on a case-by-case-basis.
57. Where more than one patented insecticide can be used to treat the same pest in crops with similar efficacy, they are likely to be closer substitutes. The ACCC is examining closely the potential overlap between Dow and DuPont's on-patent products in order to better understand the degree of closeness of competition between them.
58. On the supply side, the ACCC is considering the ability of suppliers to switch production to different crop protection products. If other suppliers are able to easily switch their production to supply products that compete with Dow and/or DuPont products, then this may act as a constraint on the actions of the merged entity. The ACCC's preliminary view is that the ease of switching varies and needs to be assessed on a case by case basis.
59. For example, where the active ingredient of a particular product is patented, and that active ingredient has a distinct purpose or application, then the scope for supply side substitution is low. A supplier would have to research and develop its own new active ingredient, which is a long and expensive process.

60. However, if the active ingredient is off-patent, or there are other active ingredients that are off-patent which could be used for a comparable product, then it may be possible for other suppliers to readily switch their production in order to bring a new generic product to market. This is particularly the case if the supplier already uses the necessary active ingredient or ingredients in its portfolio of products.
61. Nevertheless, switching production to bring a new generic product to market may still require significant investment and time, particularly if the new supplier does not already have access to the necessary off-patent active ingredient/s. There could be a significant lag in obtaining the active ingredients, developing formulas, and getting regulatory approval. Therefore, even where a supplier is well placed to switch its production, it may not be able to respond quickly to take advantage of an increase in price by the merged entity. This limits the competitive constraint that a supplier switching production, or the threat of it switching, would place on the merged entity.

Characterisation of insects

62. Based on different feeding behaviours, insects can be categorised as chewing insects, sucking insects, or both. Chewing insects tear apart and digest plant components. They also damage plants by excreting solid waste. Chewing insects include moths, caterpillars, grasshoppers and beetles.
63. Sucking insects feed on sap and liquid plant components. They excrete liquid with high sugar content (honeydew). They damage plants by transmitting disease and their honeydew facilitates fungus infections. Sucking insects include aphids, whiteflies, leafhoppers and scale insects.
64. The third category falls in between chewing and sucking pests. Thrips (or rasping pests) feed by piercing/scraping plants and sucking up components, which causes damage to the plant. The ACCC has not received any submissions that raise particular concerns in relation to thrips or other rasping pests, although some of the products discussed below can be used on thrips. Accordingly, the following discussion focuses on chewing and sucking pests.
65. Many insecticides will treat either sucking or chewing pests (but not both). Some insecticides with a broader spectrum can treat both sucking and chewing pests. However, no single insecticide is suitable for all insects and crops. Further, in some cases farmers may value narrow spectrum products over broad spectrum if:
 - the narrow spectrum products are more effective or targeted on particular insects/crops
 - the farmer does not need to treat a broad spectrum of pests, and is concerned about the potential for unnecessary treatment to contribute to resistance
 - or for other reasons among those listed above.
66. At this stage, the ACCC does not consider chewing pest insecticides and sucking pest insecticides to be in the same market, although there will be some overlapping products between them. The ACCC is further considering whether

there are particular markets based on groups of insecticides to treat particular types of pests and host plants, especially where Dow and DuPont have competing products based on patented active ingredients.

Substitution within and between chemical groups

67. Insecticides that have the same active ingredient (or the same mix of active ingredients) are relatively likely to be close substitutes for each other as they have the same chemistry. However, it is important to note that:
- even products with the same active ingredient can have characteristics which make them more or less substitutable for each other in certain conditions
 - in some situations insects can be controlled by insecticides with different active ingredients, which have different modes of action.
68. In summary, the degree of substitution between products, or the closeness of competition between products, varies significantly depending on the specific use proposed. In the next phase of the ACCC's review, we intend to examine further the closeness of competition between DuPont and Dow's products, and the extent of substitutability of rival products, based on their specific uses.

Chewing pest insecticides

Key overlaps between Dow and DuPont, and the closest substitutes from competitors

69. In relation to chewing pests, the main area of overlap that has been raised as a potential area of competition concern during market inquiries, is between Rynaxypyr and Cyazypyr from DuPont, and Dow's products from the Spinosyns chemical class. Concerns have also been raised in relation to DuPont's off-patent products containing Indoxacarb. The following table gives details of these products. It also includes competitors' products with the same mode of action as the relevant Dow and DuPont products. Market inquiries suggest these are likely to be the closest substitutes supplied by competitors.

Table 3: Chewing pest insecticide products of focus

Supplier	Product	Active ingredient	Chemical class and mode of action group	Patent protection (Australia)
DuPont	Altacor, Coragen	Chlorantraniliprole (also known as Rynaxypyr)	Anthranilic diamide (28)	Expires 2021

Supplier	Product	Active ingredient	Chemical class and mode of action group	Patent protection (Australia)
DuPont	Benevia, Exirel	Cyantraniliprole (also known as Cyazypyr)	Diamides (28)	Expires 2022
Dow	Delegate, Success Neo	Spinetoram	Spinosyns (5)	Expires 2016/2027 ¹
DuPont	Avatar, Steward	Indoxacarb	Spinosyns (5)	Off patent
Bayer	Belt	Flubendiamide	Diamides (28)	On patent
Bayer	Lineout (cotton only)	Flubendiamide, Thiacloprid	Diamides (28), Neonicotinoids (4A)	On patent
Syngenta	Voliam Flexi, Durivo	Chlorantraniliprole (Rynaxypyr) mixed with Thiamethoxam	Diamides (28), Neonicotinoids (4A)	Expires 2021 ²
ISK	n/a	Cyclaniliprole	Diamides (28)	Pipeline product

70. Each of these products is suitable for use on a range of insects and crops, although their coverage does not overlap precisely. The products compete with each other to varying degrees in different contexts, depending on the relevant crop and pest. In each relevant market, only a subset of the products above may be relevant options. For example, Lineout (Bayer's mix of Flubendiamide and Thiacloprid) is only registered for use on cotton crops.
71. DuPont's Altacor and Coragen products, based on the active ingredient Rynaxypyr, are registered for use on chewing insects on fruits, vegetables, grapes, potatoes, soy beans, rice, maize and cotton. The Avatar and Steward DuPont products (Indoxacarb) are registered for use on chewing and selected sucking insects on vegetables, alfalfa, chickpeas, cotton, fava beans, mungbeans and soybeans.
72. DuPont's Benevia and Exirel, based on the active ingredient Cyazypyr, have a broader spectrum of control than Altacor and Coragen (Rynaxypyr) because they are effective against various chewing and also sucking insects. Cyazypyr is the most recent insecticide addition to DuPont's portfolio and has not yet been fully commercialised in Australia for general use. To date, registration has been

¹ Composition of matter patent expires in 2016 and method of manufacture patents expire in 2027.

² The patent for Chlorantraniliprole expires in 2021, but Thiamethoxam is off patent.

granted for use on cotton (in November 2013), fruiting vegetables and cucurbit crops (in April 2015).

73. Dow's Delegate and Success Neo products are registered for use on chewing insects and rasping insects including thrips on various fruit crops. These products, based on the active ingredient Spinetoram, have largely replaced Dow's older chemistry Spinosad (product Naturalure), from the same chemical class.
74. Bayer's Belt, based on the active ingredient Flubendiamide, is registered for use on chewing insects on vegetables, potatoes, tomatoes, chia, herbs and strawberries. Bayer's Lineout, based on the active ingredients Flubendiamide and Thiacloprid, is registered for use on chewing and sucking insects on cotton.
75. Syngenta's Voliam Flexi, based on a mixture of the active ingredients Rynaxypyr and Thiamethoxam, is registered for use on chewing and sucking insects on cotton. Syngenta's Durivo, also based on the active ingredients Rynaxypyr and Thiamethoxam, is registered for use on chewing and sucking insects on leafy and fruiting vegetables.
76. The ACCC has not formed a final view on defining the relevant markets and market shares. However, market inquiries suggest Dow and DuPont will have a very strong position in relation to Cyazypyr, Rynaxypyr and Spinetoram. The ACCC has estimated that Dow and DuPont would account for a large majority of sales of all products listed in Table 3 above. Other potential substitute products sold by competitors are discussed below.

Other potential substitutes (for some uses)

77. Depending on the crop and pest in a particular situation, some of the following products may also be relevant substitutes. They do not have the same mode of action as the Dow and DuPont products in Table 3 above. They are therefore less likely to be close substitutes for as many uses. The list below shows the active ingredient, with the product name, supplier and IRAC mode of action group in brackets:
 - Fenoxycarb (Insegar, Syngenta, 7B)
 - Thiacloprid (Calypso, Bayer, 4A)
 - Emamectin Benzoate (Affirm/Proclaim, Syngenta, 6)
 - Thiodicarb (Larvin, Bayer, 1B)
 - Fipronil (Regent, BASF, 2B)
 - Bacillus thuringiensis (multiple suppliers, 11)
 - Synthetic pyrethroids (multiple suppliers, 3A)
78. Several other suppliers of chewing pest insecticides are present in Australia. These include Nufarm, Sumitomo Chemical, Sipcam-Oxon, FMC and Adama. However, most of these are more focused on generic off-patent insecticides. The

ability of generic suppliers to constrain the patented products of originators may be somewhat limited.

The ACCC invites comments from market participants on the closeness of competition between the products identified above, and the extent to which they are substitutes. Please respond to the following questions.

- Are there any Dow products listed above for which, if the price increased by 5 or 10 per cent, you would switch to a DuPont product? Which products?
- Similarly, are there any DuPont products listed above for which, if the price increased by 5 or 10 per cent, you would switch to a Dow product? Which products?
- Considering the products identified in your responses to the previous two questions, if the price of both the Dow and DuPont products increased by 5 or 10 per cent, would you switch to another product? Which product(s) would you consider switching to?
- For each of the Dow and DuPont chewing pest insecticides mentioned above, are there any features of these that you value and which are not available from generic or other insecticides?
- Do you consider the proposed merger would have any impact on innovation for the development of pipeline chewing pest insecticides in Australia?

Sucking pest insecticides

Key overlaps between Dow and DuPont, and the closest substitutes from competitors

79. The ACCC understands that DuPont's Benevia and Exirel insecticides, and Dow's Transform insecticide, have some overlapping registered uses for the control of certain sucking pests, such as aphids. Further details on these products and potential competing products are provided in the table below.

Table 4: Sucking pest insecticide products of focus

Supplier	Product	Active ingredient	Chemical class and mode of action group	Patent protection (Australia)
Dow	Transform	Sulfoxaflor	Sulfoximines (4C)	Composition of matter patent expires 2027
DuPont	Benevia and Exirel	Cyantraniliprole (also known as Cyazypyr)	Diamides (28)	Expires 2022
Bayer	Lineout (cotton only)	Flubendiamide, Thiacloprid	Diamides (28), Neonicotinoids (4A)	On patent

Supplier	Product	Active ingredient	Chemical class and mode of action group	Patent protection (Australia)
Syngenta	Voliam Flexi, Durivo	Chlorantraniliprole (Rynaxypyr) mixed with Thiamethoxam	Diamides (28), Neonicotinoids (4A)	Expires 2021 ³

80. As with chewing pests, each of these products is suitable for use on a range of insects and crops, but their coverage does not overlap precisely. Therefore they may compete with each other in numerous relevant markets, depending on the relevant crop and pest. In each relevant market, only a subset of the products above may be relevant options.
81. Dow's Transform insecticide, containing the active ingredient Sulfoxaflor, was only recently introduced in Australia. It received APVMA approval in 2013. It is registered for use against:
- sucking insects such as aphids in canola, cereals, cotton soybeans, pome fruit and stone fruit
 - mirids and whitefly in cotton
 - mealybug in grapes.
82. As noted above, DuPont's Benevia and Exirel (based on Cyazypyr) are registered for use on sucking insects on fruits, vegetables and cotton, but have not yet been fully commercialised in Australia for general use. As Dow's Sulfoxaflor and DuPont's Cyazypyr are relatively new to the market and are in the process being fully commercialised, they are potential close substitutes for each other.
83. The ACCC is considering whether Transform and Benevia/Exirel are close substitutes, and whether there are any products that can be used for the same use and provide the same or similar efficacy. Their active ingredients, Sulfoxaflor and Cyazypyr, belong to different mode of action groups (group 4C and group 28 respectively) and have different chemical classes, but can both be used to treat sucking pests.
84. As indicated earlier, new patented products can provide farmers with benefits that are not necessarily available from more dated products. For instance, the ACCC understands that Transform has been effective in treating green peach aphids where applications of other insecticides have been less effective in some cases (for example, by aphids surviving earlier applications of other insecticides).
85. Bayer's Lineout, based on a mixture of the active ingredients Flubendiamide and Thiacloprid, is registered for use on chewing and sucking insects on cotton.

³ The patent for Chlorantraniliprole expires in 2021, but Thiamethoxam is off patent.

86. Syngenta's Voliam Flexi, based on a mixture of the active ingredients Rynaxypyr and Thiamethoxam, is registered for use on chewing and sucking insects on cotton. Syngenta's Durivo, also based on Rynaxypyr and Thiamethoxam, is registered for use on chewing and sucking insects on leafy and fruiting vegetables.
87. As with chewing pests, the ACCC has not formed a final view on defining the relevant markets and market shares. However, market inquiries suggest Dow and DuPont will have a very strong position in relation to Sulfoxaflor and Cyazypyr. The ACCC has estimated that Dow and DuPont would account for a large majority of sales of all products listed in Table 4 above. Other potential substitute products sold by competitors are discussed below.

Other potential substitutes (for some uses)

88. Depending on the crop and pest in a particular situation, some of the following products may also be substitutes. They do not have the same mode of action as any of the Dow and DuPont products of focus in Table 4 above. They are therefore less likely to be close substitutes for some uses. The list below shows the active ingredient, with the product name, supplier and IRAC mode of action group in brackets:
- Fenoxycarb (Insegar, Syngenta, 7B)
 - Thiacloprid (Calypso, Bayer, 4A)
 - Thiodicarb (Larvin, Bayer, 1B)
 - Fipronil (Regent, BASF, 2B)
 - Synthetic pyrethroids (multiple suppliers, 3A)
 - Spirotetramat (Movento, Bayer, 23)
 - Pyriproxyfen (Sumitomo, 7C)
 - Pymetrozine (Chess, Syngenta, 9B)
 - Thiamethoxam (Actara, Syngenta, 9B)
89. Several other suppliers of sucking pest insecticides are present in Australia. These include Nufarm, Sumitomo Chemical, FMC and Adama. However, most of these are more focused on generic off-patent insecticides. The ability of generic suppliers to constrain the patented products of originators may be somewhat limited.

The ACCC invites comments from market participants on the closeness of competition between the products identified above, and the extent to which they are substitutes. Please respond to the following questions.

- Do you consider Dow's Transform and DuPont's Benevia and Exirel to be close substitutes for the treatment of sucking pests on particular crops?

- If the price of Transform increased by 5 or 10 per cent, would you switch to Benevia or Exirel (and vice versa)? Why or why not?
- Are there any particular advantages of Transform, Benevia and Exirel for farmers that are not available from other existing products (e.g. the ability to overcome pest resistance)? If so, do the other products listed in Table 4 provide any of the same advantages?
- If the merged entity chose to raise the price of its sucking pest insecticides by 5 or 10 per cent, would you switch your purchases to any other insecticide? If so, which one would you switch to?

Other issues relating to crop protection – distribution

90. Some concerns have been raised with the ACCC that the proposed merger may lead to a reduction in competition for the distribution of crop protection products. It has been suggested to the ACCC that agency agreements between distributors and chemical companies may affect competition by creating the potential for rival chemical companies to be excluded from retail markets. The proposed merger could exacerbate this issue by giving the merged entity a stronger upstream market position.
91. A chemical company with a strong upstream market position could attempt to use various methods to limit its rivals' access to downstream markets. These may include offering rebates, incentives or other terms to encourage distributors to stock the supplier's full product range in preference to its rivals. The merged entity would have a significantly enhanced range of products than either Dow or DuPont individually, including on-patent products, which may enable it to implement such strategies more effectively.

The ACCC invites comments from market participants on the issue identified above. Please respond to the following questions.

- Are there any difficulties for rivals of Dow and DuPont getting retailers and intermediaries to stock and market their products?
- If the proposed merger were to proceed, would your response to the question above change at all?
- Would the proposed merger provide the merged entity with the ability to impede rivals (or potential rivals) from supplying agricultural chemicals via retailers or intermediaries, including through agency or exclusive agreements with retailers/intermediaries?

Issue that may raise concerns: seeds

92. Based upon its inquiries to date, the ACCC's preliminary view is that the proposed merger may substantially lessen competition in relation to the development, production and supply of canola seed for the Australian market.
93. The proposed merger would result in the horizontal aggregation of two important global companies involved in seed research and development. The ACCC is concerned that the proposed merger may result in a reduction in competitive

tension in research and development activity, leading to a slower pace of development of new canola seed varieties for Australia.

94. The ACCC is considering the effect of the proposed merger on both:
- a market for the development of canola seed varieties
 - a market (or markets) for the supply of canola seed.
95. There is also potential for the merger of DuPont's extensive seed business with Dow's crop protection business to raise competition issues in the development and supply of seed more broadly. This is discussed at paragraph 106 below.

Removal of a competitor in seed development

96. Although Dow does not currently sell canola seed in Australia, it has recently announced that it is developing canola seed for the Australian market. The ACCC's inquiries have indicated that Dow is a significant contributor to seed research and development globally and that it is likely to be a strong future competitor. In particular, market feedback has pointed to Dow's strong position in canola seed in Canada, which it is able to leverage to develop Australian varieties.
97. DuPont recently sold its seed supply business DuPont Pioneer Australia (**Pioneer**) to Philip Yates Family Holdings. However, DuPont retained Pioneer's research and development functions. The ACCC's inquiries suggest that DuPont remains one of the market leaders in the development of seed varieties (including canola) for supply to Australia.
98. Therefore, the ACCC's preliminary view is that, in the absence of the proposed merger, Dow and DuPont would compete to develop new canola seed varieties. Dow is in a position to produce and commercialise such varieties itself, whereas DuPont would license its varieties for production and supply by Pioneer.
99. The ACCC recognises that there are several alternatives to Dow and DuPont which are active in the development of canola seed in Australia, including Nuseed, Pacific Seeds, Bayer and Cargill. However, market feedback to date has suggested that the market may nonetheless be substantially less competitive in future with the merger of Dow and DuPont.
100. Further, the ACCC's preliminary view is that there is a very low likelihood of new entry into canola seed development in Australia. The development of new seed varieties can take 7-10 years, and involves significant regulatory barriers. Seed developers require significant capital, experience and access to a library of genetic material. Dow is an example of a recent new entrant, but it already had a significant global seed development business, and a crop protection business in Australia. The ACCC's inquiries to date have not identified any corporation in a similar position to Dow, or any other that may seek to enter the market for canola seed development in Australia in the future.
101. In order to form a concluded view on the impact of the proposed merger on seed development and supply in Australia, the ACCC is considering further:
- the extent to which different canola varieties prosper in different 'seasonal' areas. For example, whether some areas have more limited options in

terms of seed suppliers, and whether in these areas the loss of potential future competition as a result of the proposed merger may be felt more acutely

- whether the proposed merger would impact the development and future availability of herbicide resistant trait technology
- whether the merged entity could use its seed business to exclude its rivals from crop protection markets.

Geographic variation

102. The ACCC's inquiries to date have suggested that the substitutability of different canola seed varieties depends on local geographical areas and their agronomic requirements. Market participants noted that different canola varieties prosper in different areas. Therefore, for particular major 'seasonal' areas (e.g. early, mid, late flowering or low, medium, high rainfall) the number of available substitutes may vary.

103. The ACCC is continuing to explore whether there are any seasonal areas in which there are few suitable canola varieties or suppliers, and where the loss of potential future competition between Dow and DuPont may have a greater impact. The ACCC would welcome any further information that market participants can provide in this regard.

New herbicide resistant traits

104. The ACCC's market inquiries have suggested that, at an international level, Dow is active in the development of new herbicide resistant traits, which it would be able to bring to the Australian market. Similarly, market feedback suggests that DuPont is well advanced with similar herbicide resistance technologies, including its Optimum GLY product. The ACCC is concerned that the proposed merger may result in fewer herbicide tolerant traits than would otherwise be available without the merger.

105. The proposed merger could also affect the cross-licensing of intellectual property between seed developers. Seed developers benefit from having access to a wide range of genetic material from which to develop new varieties. They often license certain intellectual property to their rivals to improve each rival's library of genetic material. Some market feedback has suggested that a merged Dow and DuPont may have less incentive to participate in such licensing, which could reduce the rate at which the market as a whole generates innovative seed varieties.

Crop protection and seed development

106. The ACCC's market inquiries have also suggested that Dow's strength in crop protection, combined with DuPont's intellectual property and strong position in relation to seed development, could enable the merged entity to develop seed products that favour its own crop protection products. This could affect a broader range of markets than just canola seeds. For example, the merged entity could use DuPont's seed business to develop varieties which are resistant to Dow's pesticides, but cannot be used with generic crop protection products. This may in turn lessen competition in crop protection products. The ACCC is seeking more information in this regard.

The ACCC invites comments from market participants on the seed issues identified above. Please respond to the following questions.

- Are there particular 'seasonal' areas (e.g. early, mid and late flowering or low, medium, and high rainfall areas) for which the number of suitable canola varieties is more limited than in other areas? Are there instances of seed suppliers marketing seeds for particular regions within Australia?
- If so, is it likely that the merger of Dow and DuPont would impact the likelihood of more varieties being available in the future that are well suited to these areas?
- Are there any general differences between the main canola tolerance traits (e.g. Roundup Ready, Imidazoline tolerance and Triazine tolerance) and the seasonal areas for which they are most suited?
- Do you consider that the development of new herbicide resistant traits is important for canola production in the future, having regard to the need to avoid the natural development of herbicide resistance in weeds and any other factors? In particular, please comment on the importance of traits which are the result of genetic engineering.
- Would the merger of Dow and DuPont, with their position in Australia in crop protection and seed development, put the merged entity in a position where it could develop new seed products (whether for canola or other plants) to reduce farmers' ability to use generic crop protection products? If so, why would the merged entity have a greater ability than either Dow and/or DuPont would have as separate entities? What would be the impact on competition in the various markets for crop protection products?

Issue that may raise concerns: materials science

Areas of overlap

107. Materials science products include performance plastics and materials/chemicals that are derived from petrochemical products. The key areas of overlap between Dow and DuPont are in the manufacture and supply of the following products:

- **Ionomers**, which are used for manufacturing food packaging, cosmetics, medical devices, golf balls and other industrial applications. Dow manufactures ionomer products under the Amplify IO brand, and DuPont under the Surlyn brand.
- **Acid co-polymers**, which are often used to bond metal together. For example, they can be used as a foil adhesive layer in juice packaging, as a heat sealant for tea bags and sauce sachets, and as an adhesive in other aluminium products. Dow manufactures acid co-polymer products under the Primacor brand, and DuPont under the Nucrel brand.
- **MAH grafted polymers**, which are functional polymers that have been modified (by maleic anhydride grafting) to help bond together dissimilar polymers used in toughened, filled and blended compounds. Dow manufactures MAH grafted polymers products under the Amplify GR, Amplify TY and Retain brands. DuPont manufactures MAH grafted polymers under the Fusabond and Bynel brands.

108. Neither Dow, nor DuPont, manufactures these products in Australia.

Market definition

109. The ACCC's preliminary view is that the markets relevant for assessing the competition effects of the proposed merger are individual product markets for the supply of ionomers, acid co-polymers and MAH grafted polymers.

110. From a customer perspective, different types of polymers and ionomer resins are not substitutable. From a manufacturing perspective, the equipment used to manufacture different types of polymers cannot be switched easily across to manufacture acid co-polymers and ionomers. In particular, information received by the ACCC suggests that specialised equipment and machinery with acid-resistant coating would be needed to commence producing acid co-polymers.

111. The production of ionomers is quite specialised as it requires neutralisation of acid co-polymers with other compounds. Because of this, other manufactures of materials science products are unlikely to be able to switch manufacturing in a timely manner in a way that would act as a significant constraint on a merged Dow/DuPont.

Competition concerns

112. Based on its inquiries to date, it appears there are few competitors currently supplying, or offering to supply, ionomers and acid co-polymers in Australia. Market feedback has been more mixed about the level of competition for the supply of MAH grafted polymers in Australia.

113. Some customers indicated that Dow and DuPont are the only suppliers, or potential suppliers, of ionomer and acid co-polymer materials available to them. The complex end uses for these products means that, for many customers other ionomer resins or polymers are not substitutes. While some customers do not presently acquire materials science products from both Dow and DuPont (and the parties have submitted that their acid co-polymers are differentiated from each other), they consider the option to purchase from both companies provides important competitive tension. This competition would be lost with the proposed merger.

114. The ACCC is concerned that the proposed merger involves a significant decrease in the number of supply options for ionomers and acid co-polymers for customers in Australia. The materials science activities of Dow and DuPont currently constrain each other because, at least for some products, the two companies compete for sales and customers and there appear to be few other supply options. The merger will remove the current constraining effect each company has on each other and potentially lead to price increases or reductions in quality. It does not appear likely that there will be new entry or expansion that would constrain the merged entity.

The ACCC invites comments from market participants on its concerns in relation to ionomers, acid co-polymers and MAH grafted polymers. Please comment on the following:

- The ability, timeliness and cost to manufacturers of other materials science products entering or expanding production of acid co-polymers, ionomers or MAH grafted polymers.

- The number of companies supplying, or who have the ability to supply, acid co-polymers, ionomers and MAH grafted polymers in Australia.

ACCC's future steps

115. As noted above, the ACCC now seeks submissions from market participants on each of the issues identified in this Statement of Issues and on any other issue that may be relevant to the ACCC's assessment of this matter. Submissions are to be received by the ACCC no later than 24 November 2016 and should be emailed to mergers@acc.gov.au.
116. The ACCC will finalise its view on this matter after it considers submissions invited by this Statement of Issues.
117. The ACCC intends to publicly announce its final view by 2 February 2017. However the anticipated timeline may change in line with the *Informal Merger Review Process Guidelines*. A Public Competition Assessment for the purpose of explaining the ACCC's final view may be published following the ACCC's public announcement to explain its final view.