NOTES ON CHEMICALS USED IN CANOLA

The following information has been prepared on chemicals used in commercial seed canola production in Australia, using our own personal experience and reference to the old class system.
It is essential that growers do not batch mix chemicals, or losses of bees and crop will occur, due to the altering of the individual chemical ingredients' toxicity.
The information is a guide only, to help protect bees and increase seed crop returns.
W.Jones

PESTICIDES

(**1**) **Alpha-cypermethrin** – a synthetic pyrethroid (SP) – should only be applied late evening or sunset. Very toxic to honeybees. Initial bee kill reduced by spraying evening or at sunset. Greater than 10 hrs residual toxic effect extending the next day. There is some bee repellency action - must be sprayed evening or sunset.

(2) **Bacillus Thuringienses** – can be used any time , not a problem for bees – on its own. Do not batch-mix with other chemicals.

(3) **Beta-cyfluthrin** (SP) Spray at sunset or evening only or bee losses will occur. Residual is longer than 10 hrs. Highly toxic. Effect on bees reduced by spraying at sunset or evening.

(4) **Bifenthrin** (SP) spray at sunset or evening. Very toxic. Greater than 1 day residual hours. Has not shown bee repellency.

(5) **Chlorpyrifos** – can only be sprayed 7 days before bees are to be placed into the crop to be pollinated – this chemical has a 7 day knock down against bees and cannot be used while bees are in the crop.

(6) **Cyper-methrin** (SP) this chemical has a knock down effect on bees of 3 – 4 days and is not suitable for use in a crop that requires honeybee pollination. If needed, bees must be removed. Easier to change the chemical choice.

(7) **Delta-methrin** (SP) Spray this chemical at sunset or evening. There is some repellency effect. The chemical is rated 4 – 10 hours, quite safe if sprayed at unset or evening. Never in the morning, or large bee kills can occur.

(8) **Dimethoate** – cannot be used in any field crop or horticulture crop any later than 3 weeks before flowering or 3 weeks before the bees are to be placed in the crop. This is a very good systemic chemical that can cause severe losses of bees due to contaminated pollen and nectar being taken home to the hive 3 weeks after application. This chemical has a 75hr knockdown effect with 3 weeks of systemic activity.

(9) **Endosulfan** – This is a very good chemical especially in seed production or crops that require honeybees or beneficial insects to achieve seed or fruit set. This is an 8 hr chemical. Apply at sunset or evening. No morning application to occur or large losses of bees will result.

(10) **Esfen-valerate** (SP) This is a very toxic chemical and can only be sprayed at sunset or evening. It has a toxic effect on honeybees of 6 – 8 hrs which is slightly longer than Fenvalerate. Spray sunset or evening only.

(11) **Fipronil** - this is a very toxic chemical. Research has shown that when sprayed on crop (cotton) there is a toxic residual effect of 28 days which is consistent with the label statement. . No application should be considered inside the 28 day residual toxic effect of this chemical or large kill of bees will result.

(12) **Gama- cyhalothin** (SP) This chemical can only be used at sunset or evening. It has a residual of 6+ hrs but is quite safe if applied at sunset or evening. This formulation is classed as a capsule in suspension and not micro-encapsulated.

(13) **Imidochloprid** is a neonicotinoid, a synthetic copy of the old tobacco chemicals. This group of chemicals is very dangerous to honeybees; they have an acute toxicity basis of (LD50>0.0439 mg/bee). Documented sublethal effects of neonicotinoids include physiological effects that affect enzyme activity leading to impairment of olfactory memory leading to impairment of their memory and brain metabolism. This chemical should not be used if the crop required honeybees or other insects to set seeds or fruit.

Chemicals in this group are very effective systemic insecticides – the honeybee has no chance as the olfactory memory function, is the most important honeybee activity, which enables the pollinating honeybee to move from hive to flower and back again in their short life span as pollinators.

The residues that occur in plants from seed treated or sprayed with these chemicals are in many cases sub-lethal but sufficient to cause loss of the honeybees' ability to pollinate, resulting in seed crop losses or failure.

Not safe to use as a seed dressing or as a spray on a crop that requires honeybee pollination to produce a seed, nuts or fruit.

(14) **Lambda-cyhalothin** (SP) (micro encapsulated chemical increases its toxicity by 5-6 days to honeybee pollinators that can return to the hive with the small capsules when dry mixed with pollen and nectar causing hive damaged. Gama-cyhalothin on the other hand is being used on Lucerne/clover seed production without noticeable effect to our bees over several years.

(15) **Maldison** – cannot be used as this chemical has a residual of 2-6 days; when applied to a crop that bees are pollinating large losses of bees will occur.

(16) **Methidathion** – cannot be used as this chemical has a residual of 1-3 days. Large losses of bees have occurred as a result of using this chemical on crops that require honeybees. It is not just the bee loss, it is also the lost production caused when the pollinators are taken out as well as the targeted insects.

(17) **Methomyl** – cannot be used. Has a residual greater than 1 day to pollinating honeybees. Cannot be used on a crop in flower that honeybees are pollinating.

(18) **Nuclear Polyhedrosis Virus** – no problem with this one. Use on its own - do not batch mix with other chemicals.

(19) **Omethoate** – residual is greater than 1 day to honey bees and other pollinating insects. Cannot be used on a crop in flower that honeybees are pollinating.

(20) **Permethrin** (SP) Greater than 2 days residual – cannot be sprayed on a crop in flower that honeybees are pollinating. Some repellency, but not enough as the residual period is too long to safely use on crops to be pollinated. Can be used in crops before bees are required – apply no later than 5 days before bees are required to be placed into the crop.

(21) **Phosmet** – greater than 1-4 days residual to honey bees and other pollinating insects. Can be used in crop before bees arrive – allow 4 days for effects to abate.

(22) **(Pirimicarb** (active ingredient)) > 2hrs residual – can be used anytime
(23) **(Pirimor** (Trade name of above)) Avoid overspray of bee boxes and equipment.

NOTE: The above has been learnt over many years. Many bees have been killed by chemicals to reach the above conclusions. The above is a guide and users of this guide/advice do so at their own risk. Batch mixing of chemicals in some cases greatly increases the toxicity of the chemicals to honey bees. **Chemical use should be discussed with the grower before placing bees on the canola crop.**