The Flight of Toxic Tort - Aerial Application of Insecticides and Herbicides: From Drift Liability to Toxic Tort

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THE WEEK BEFORE Labor Day of 1982 was a beautiful time for golf in the Washington, D.C. area. Mr. X took advantage of the weather to play several rounds of golf that week at the Army/Navy Country Club. The previous week, the country club had applied chlorothalonil, a pesticide, to the course. The multiple exposures that Mr. X received to the chemical "burned the flesh off his body from the inside out and caused his internal organs to fail." Mr. X died 20 days later.

Stories such as this one illustrate the destructive potential of pesticides on American yards, gardens, golf courses, ranches, and farms. While the capacity of these chemicals to boost plant and crop yields cannot be doubted, society is more frequently questioning the cost
of these chemicals' use. Scientists voice concerns that residues of pesticides on raw agricultural products may have lasting, cumulative effects on humans. For example, DDT causes massive harm to many species of wildlife. Agricultural chemical use may be a contributor to non-point source pollution such as run-off from rain water, contaminating the groundwater from which our drinking water springs. Such chemicals allegedly are also involved with fish kills. Agent Orange, a defoliant used in Vietnam, injured many American soldiers exposed to the chemical in combat.

These claimed long-term effects of the chemicals only recently have been reaching the courts. The short-term toxic effects, however, have been litigated in the context of aerial application since the 1930s. The simple fact is that it is virtually impossible to apply insecticides or herbicides without immediate drift. Occasionally, chemical drift causes a problem that is litigated. Three factors affect drift of the chemicals in aerial application: (1) the size of the spray particle; (2) air agitation produced by the aircraft; and (3) natural aerial forces. As an example, one "droplet of 3 micron size may drift 8 miles in a 3 [mile per hour] wind when falling from the height of only ten

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6 See infra notes 113-132 and accompanying text.
8 S.A. Gerrard Co. v. Fricker, 27 P.2d 678 (Ariz. 1933).
The aerial application of herbicides and insecticides thus inherently poses well-documented and thoroughly litigated short-term risks because of immediate effects on neighboring landowners.

Long-term liability for latent or cumulative effects of these chemicals has only recently come to the fore. Seemingly, the liability of aerial applicators, the farmers they serve, and the farmers' and applicators' insurers could be unpredictable and unlimited if the agriculture industry must bear the burden of liability for the long-term effects of insecticides and herbicides. A worst-case scenario such as the asbestos industry, bankrupt and overloaded with liability, immediately comes to mind.12

Fortunately, such potential ruinous liability has not yet been pinned on the agriculture industry in the United States. Toxic tort law in the aerial application context would have to evolve drastically to accommodate long-term toxic tort litigation. Only a few halting steps have been taken in that direction, but analysis of the history of aerial application of chemicals and litigation in the United States is in order. Any long-term toxic tort litigation in an aerial application context must evolve from past precedents. A clear understanding of where the law of aerial application of chemicals has been is necessary to gauge where the future might lead.

This article will therefore chart aerial application litigation and focus on the various state standards of liability and causation. Damage calculations, indemnification issues, and insurance questions will also be relevant for this discussion. The article will briefly target various statutory and regulatory schemes governing the aerial application of insecticides and herbicides. Finally, recent develop-

11 Birmingham & Kyl, supra note 9, at 587; Note, Crop Dusting: Legal Problems In a New Industry, supra note 10, at 73.

ments in this area will be detailed and suggestions for the future will follow.

II. LIABILITY

A. Parties

The plaintiffs in these aerial application cases are normally the neighboring landowners or third parties who live near the fields where the chemicals have been sprayed. This litigation usually involves at least two, but potentially four or more defendants. The obvious defendant is the farmer who ordered and whose crops benefitted from the aerial application of the chemicals. The other typical defendant is the aerial application service. The plaintiffs might also sue the chemical manufacturer for defects in the chemical (i.e., the chemical works too well, or the manufacturer failed to warn the user of certain effects of the products). Finally, plaintiffs will almost certainly bring into aerial application suits any insurers of the previously mentioned defendants who may be liable by contract for these damages.

B. Standards of Liability or Fault

Several theories of liability for aerial application injuries can be utilized in these cases. Negligence, strict liability, nuisance, and trespass have all been the basis for liability in the various state jurisdictions. For our purposes the southern and western agricultural regions of this nation provide jurisdictions that illustrate these theories of liability.

1. Nuisance

American courts, when first confronted with aerial application of pesticides, applied the nuisance theory of lia-

\[^{13}\text{See infra notes 172-178 and accompanying text.}\]
\[^{14}\text{See infra notes 179-222 and accompanying text.}\]
\[^{15}\text{See infra notes 223-247 and accompanying text.}\]
bility. A nuisance is any damage caused by conduct that is abnormal and out of place in its surroundings. In the first reported case involving aerial application of a chemical, *S.A. Gerrard Co. v. Fricker*, the Arizona Supreme Court ruled that the application of chemicals by airplane to aid agriculture was an inherently dangerous activity. The court held that the farmer who ordered his fields sprayed with chemicals was strictly liable for the deaths of his neighbor's bees. The bees died when insecticide sprayed by defendants drifted onto plaintiff's apiaries. Although the *Fricker* court did not allude to the nineteenth century English decision, *Rylands v. Fletcher*, the rationale behind the decision was similar. The "rule" of *Rylands v. Fletcher* is that the defendant will be liable when he damages another by a thing or activity unduly dangerous and inappropriate to the place and its surrounding.

The court in *Gainey v. Folkman*, another Arizona precedent, utilizing a nuisance standard, quoted *Rylands v. Fletcher*:

If a person brings, or accumulates, on his land anything which, if it should escape, may cause damage to his neighbor, he does so at his peril. If it does escape, and cause damage, he is responsible, however careful he may have been, and whatever precautions he may have taken to prevent the damage.

The *Gainey* court also quoted the ancient common law nuisance maxim, *sic utere tuo ut alienum no laedas* or "so use your own [property in such a manner] as not to injure

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18 27 P.2d 678 (Ariz. 1933). See Peter McBreen, *Legal Implications of Agricultural Aviation*, 18 J. AIR L. & COM. 399, 400 (1951) (Fricker is the first reported aerial application case.).
19 Fricker, 27 P.2d at 680.
20 Id.
21 L.R. 3 H.L. 330 (1868).
22 Fricker, 27 P.2d at 680.
25 Id. at 232 (quoting Rylands v. Fletcher, L.R. 3 H.L. at 340).
The Gainey case involved a cattle farmer who claimed cropdusting with DDT by another farmer in the area harmed his herd of cattle and family. The plaintiff claimed "that the toxic character of the chemicals used and the absence of full knowledge or presence of uncertainty as to their effects would warrant the court in preventing the defendant from injecting the chemicals into the air over the plaintiff's ranch." The Gainey court described its nuisance liability threshold as the deliberate impregnation of the air over another's land with chemicals dangerous to livestock or humans. Nevertheless, the plaintiff's failure to prove any damage to humans or livestock barred his claim.

In essence, courts that have utilized the nuisance doctrine to determine liability based their decisions on the presumption of aerial applications of chemicals to crops as inherently dangerous. Plaintiffs who can prove injury to property or persons will recover.

In the past, however, California courts have utilized a quasi nuisance standard of liability, even while expressly stating that cropdusting is lawful and necessary. The Miles v. A. Arena & Co. court referred to standards of care and foreseeability, thoroughly confusing attempts to decide whether this case was grounded in nuisance or negligence. In Miles, the plaintiff sued and recovered damages when dust drifted onto his bee apiaries from defendant's cropdusting.

2. Trespass

California courts tried a new basis of liability, trespass, in disposing of the next group of aerial application cases,

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26 Id.; see also BLACK'S LAW DICTIONARY 1388 (6th ed. 1990).
27 Gainey, 115 F. Supp. at 236.
28 Id. at 236-37.
29 Id. at 240.
30 See, e.g., infra note 31.
32 Id. at 1263.
33 Id.
which again involved bees. In *Lenk v. Spezia* and *Jeanes v. Holtz*, California courts of appeal rendered verdicts against plaintiffs whose bees allegedly died as a result of the aerial applications of chemicals to fields near their apiaries. In the *Lenk* decision, the court found that though the bees died in great numbers around their apiary, the trespassing of the bees onto the recently sprayed farmland caused their deaths. Though the defendants knew of the harmful effects of the chemicals on the bees, the court found that the plaintiffs could only recover if they proved the defendants distributed the spray wantonly, maliciously, or deliberately to destroy the bees. The plaintiffs in *Lenk* could not meet this burden; in fact the defendants warned the plaintiffs of the dusting, but the plaintiffs refused to move the bee apiaries away from the fields to be dusted.

In *Jeanes v. Holtz*, the trial court sustained the defendants' demurrer and dismissed the suit. The plaintiffs relied on the negligence per se theory claiming that the defendants failed to warn them of exposure to poison on their land as required by a California statute. The court noted that the statute did not apply to bees. Further, since the plaintiffs did not allege that the aerial application of the chemical actually reached the apiaries, the defendants could not be liable. The only way the spraying could have affected the bees was if the bees trespassed on the defendants' property.

In *Schronk v. Gilliam*, a Texas court addressed whether

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36 *Lenk*, 213 P.2d at 53.
37 *Id.* at 51.
38 *Id.* at 52-53.
39 *Jeanes*, 211 P.2d at 926.
40 *Id.* CAL. PENAL CODE § 596 (West 1988) (poisoning animals; exceptions; posting warning signs).
41 *Jeanes*, 211 P.2d at 926.
42 *Id.* at 927-28.
43 *Id.*
44 380 S.W.2d 743 (Tex. Civ. App.—Waco 1964, no writ).
trespass of defendant's airplane could be a basis for liability.\textsuperscript{45} The court analyzed the decision by the United States Supreme Court in \textit{United States v. Causby}\textsuperscript{46} and found that plaintiffs could assert a cause of action for overflight of their fields if the flight enters the immediate airspace adjacent to the plaintiff's property and the flight of the aerial applicator unreasonably interfered with plaintiffs' enjoyment of their property.\textsuperscript{47} Since the defendant's airplane flew over plaintiffs' land with its spraying equipment operational, defendant's plane directly caused injury to plaintiffs' crops.\textsuperscript{48} The Arizona Supreme Court penalized a cropduster for an identical trespass in \textit{Sanders v. Beckwith}.\textsuperscript{49}

3. \textit{Strict Liability}

Louisiana became the first jurisdiction to impose strict liability on farmers and aerial applicators of herbicides and insecticides in \textit{Gotreaux v. Gary}.\textsuperscript{50} The fact pattern of the \textit{Gotreaux} case is unremarkable. Defendant Gary contracted with Welch Flying Service to spray his rice crop with 2,4-D, a hormone-type herbicide. While Welch was spraying the field, the wind rose and forced Welch to terminate operations. The court found that the wind also apparently facilitated the drift of the already applied herbicide onto plaintiff Gotreaux's cotton.\textsuperscript{51}

Since no causation question remained, the court only had to decide the basis of liability on which plaintiff would recover.\textsuperscript{52} The Louisiana Supreme Court cited Article 667 of the Louisiana Civil Code, which stated that "[a]lthough a proprietor may do with his estate whatever he pleases, still he can not make any work on it, which may

\textsuperscript{45} Id. at 744.
\textsuperscript{46} 328 U.S. 256 (1946).
\textsuperscript{47} Schronk, 380 S.W.2d at 745.
\textsuperscript{48} Id.
\textsuperscript{49} 283 P.2d 235, 239 (Ariz. 1955).
\textsuperscript{50} 94 So. 2d 293, 295 (La. 1957).
\textsuperscript{51} Id. at 294.
\textsuperscript{52} Id.
deprive his neighbor of the liberty of enjoying his own, or which may be the cause of any damage to him."  

The court then adopted the doctrine of strict liability for all aerial application cases in Louisiana, analogizing this case to a prior Louisiana precedent in which the court mandated strict liability for all explosive cases.\textsuperscript{54} The following quote from the court’s opinion in Fontenot v. Magnolia Petroleum Co.\textsuperscript{55} articulates the foundation of strict liability for aerial application cases in Louisiana:

We are unwilling to follow any rule which rejects the doctrine of absolute liability in cases of this nature and prefer to base our holding on the doctrine that negligence or fault, in these instances, is not a requisite to liability, irrespective of the fact that the activities resulting in damages are conducted with assumed reasonable care and in accordance with modern and accepted methods.\textsuperscript{56}

Three other states followed Louisiana’s lead and defined aerial application of chemicals as an ultra hazardous activity, which necessitates strict liability should damage to others or their property occur.\textsuperscript{57}

4. Negligence

Many jurisdictions purport to utilize a negligence standard for liability in aerial application cases. Generally, though, the threshold level of negligence needed for plaintiff’s recovery is minimal. In these cases, the courts demand that aerial application meet a standard of care relevant to the circumstances of the operation.\textsuperscript{58} As previously mentioned, the unpredictability of drift of pesticides is a constant and nearly unpreventable cause of most

\textsuperscript{55} Id. (quoting LA. CIV. CODE ANN. art. 667 (West 1980)).
\textsuperscript{54} Id. at 295 (citing Fontenot v. Magnolia Petroleum Co., 80 So. 2d 845, 849 (La. 1955)).
\textsuperscript{55} 80 So. 2d 845, 849 (La. 1955).
\textsuperscript{56} Id.
\textsuperscript{58} Kennedy, supra note 10, at 87.
Accordingly, the state courts' views of the nature of aerial application as "inherently or extremely dangerous" calibrates the burden plaintiffs must satisfy to prove liability. Most courts hold aerial applicators and the farmers for whom they work to a very high standard of care because of the recognized danger of the operation. Although normally treated as a question of law, at least one state, Arkansas, has left the question of inherent dangerousness of aerial application for the jury. The "inherent dangerousness" approach of the courts results in the minimal plaintiff burden for liability.

The slight burden necessary to prove liability and varying theories of liability within one jurisdiction are exemplified by Texas jurisprudence in this area. Texas courts imposed liability on aerial applicators for negligence in allowing herbicides to drift and settle upon neighboring crops. An earlier Texas precedent, however, condemned an aerial applicator because he applied 2,4-D knowing, or with reason to believe, that it would be injurious to cotton. The Texas courts are adamant that actionable negligence occur before defendants will be held liable; i.e., if the jury finds that simple drift of herbicide onto neighboring fields does not equal negligence, that

59 See supra notes 8-11 and accompanying text.


Liability is not absolute but is imposed on the landowner for his failure to exercise due care in a situation in which the work being performed is sufficiently dangerous that the landowner himself has a duty to third persons who may sustain injury or damage from the work unless proper precautions are taken in the performance thereof.


jury verdict will be sustained. The earlier discussed Schronk decision also used trespass as a basis for liability. Overall, the Texas courts maintain a low threshold for proving negligence, but the jury verdict still provides a mechanism by which defendants may escape liability.

Other states mandate similarly slight threshold levels for aerial applicator liability. In Heeb v. Prysock, the Arkansas Supreme Court imposed liability on a farmer because he knew or should have known that, when applied by airplane, 2,4-D would drift from his field onto the plaintiff's. In Devane v. Smith, a Georgia court of appeals permitted the trial court to instruct the jury as to the doctrine of res ipsa loquitur, i.e., the thing speaks for itself. In Devane, the defendant's control of the plane, the absence of contributory negligence on the part of plaintiff, and crop damage in rows, which ordinarily does not occur without negligence, all add up to a situation in which the inference of negligence assures the plaintiff the right to get to the jury. In Parks v. Atwood Crop Dusters, Inc., the defendants were liable because they knew or should have known that the wind would carry the defoliant onto plaintiff's cotton crop at the time of application.

III. CAUSATION

When herbicides or insecticides drift or are accidentally applied to unintended areas, liability is normally not a

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64 Gamblin v. Ingram, 378 S.W.2d 941, 943 (Tex. Civ. App.—Waco 1964, no writ); Vrazel v. Bieri, 294 S.W.2d 148, 152 (Tex. Civ. App.—Galveston 1956, writ ref'd n.r.e.).
65 Schronk, 380 S.W.2d at 745-46.
66 245 S.W.2d 577 (Ark. 1952).
67 Id. at 578-79.
69 Id. at 712-13; see also Burr v. Sherwin-Williams Co., 268 P.2d 1041, 1055 (Cal. 1954) (trial court justified in giving jury instructions reading doctrine of res ipsa loquitur).
70 Devane, 268 S.W.2d at 712.
72 Id. at 655.
high barrier to recovery for the person whose property or health is harmed. The major obstacle for many plaintiffs to overcome is causation. Proof that the defendant's aerial application of chemicals actually or, occasionally, proximately caused the damage or injury can be difficult. The proof needed for causation can generally be divided into three categories: injury to crops or plants, injury to animals, and injury to humans.

A. Crops

1. Cotton

The 2,4-D herbicide can be extremely toxic to cotton, a broad-leaf plant, but is very helpful when applied to narrow-leaf or grass plants such as rice. In the south, where both crops are staple agricultural products grown in close proximity, drift of chemicals can cause serious problems. This reality is amply reflected in the litigation history. Testimony in a case where cotton was damaged by 2,4-D reflects the condition of the cotton after the aerial application: "[The] unmistakable signs of 2,4-D damage . . . [were] that the leaves had become narrow, elongated, crinkled and ruffled around the edges and in addition the squares and flowers were deformed."73

These effects of 2,4-D on cotton influence defendants to attempt to prove that: (1) the herbicide that landed on plaintiff's crops could not have come from the spraying on defendant's land due to weather, time, or distance limitations or (2) plaintiff's crops were not actually injured by the 2,4-D as pest infestation already had or would eventually have injured plaintiff's crops. Of course, the plaintiff must prove his case only by a preponderance of the evidence. If a plaintiff can present credible expert testimony of his crop loss and evidence that defendant's application of herbicides was the sole spraying in the area, the plaintiff generally prevails.

Because strict liability governs cases of aerial applica-

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tion of herbicides in Louisiana, causation is normally the crux of such litigation. Two Louisiana cases exemplify the causation patterns in such litigation involving cotton crops. In *Jones v. Morgan*, the plaintiffs established causation against defendants by creating a record that proved: (1) their crops showed symptoms of damage by 2,4-D, and (2) the only 2,4-D spraying in proximity to their cotton was done by defendants. In *Jones*, the defendants were unsuccessful in arguing that plaintiff’s failure to designate a specific date on which the spraying occurred and an exact correlation in time between that date and the crop damage was fatal to plaintiff’s case.

In *Trahan v. Bearb*, the defendant did not appeal the trial court finding that defendant’s 2,4-D landed on plaintiff’s crops. Instead, the defendant attacked the plaintiff’s proof of loss in ultimate yield of cotton. The defendant noted excessive rain and insect infestation in the area for the period in question as well as low yields for the surrounding area in general. The counter to defendant’s attack was plaintiff’s award-winning use of modern scientific agricultural practices as testified to by the County Agent of Lafayette Parish. The court found that plaintiff satisfied his preponderance of the evidence burden of proof.

Texas litigation provides numerous instances of aerial applications’ damage to cotton. In *Pitchfork Land and Cattle Co. v. King*, plaintiff’s cotton was damaged by a

74 See supra notes 50-56 and accompanying text.
76 Id. at 111.
77 Id. at 110-11.
79 Id. at 421.
80 Id. at 422-23.
81 Id.
82 Id. at 423.
83 *Pitchfork Land*, 346 S.W.2d 598; Gragg v. Allen, 481 S.W.2d 452 (Tex. Civ. App.—Waco 1972, writ dism’d); Schronk, 380 S.W.2d 743; Leonard v. Abbott, 357 S.W.2d 778 (Tex. Civ. App.—Texarkana 1962), rev’d on other grounds, 366 S.W.2d 925 (Tex. 1963); Vrazel, 294 S.W.2d 148; Schultz, 271 S.W.2d 696.
84 346 S.W.2d 598 (Tex. 1961).
herbicide. Defendants pointed to irregularities in time and the drift pattern effect of the herbicide on plaintiff’s crops to prove that their spraying did not actually cause the damage. Plaintiffs documented that no other spraying occurred within a fifty mile radius during the period in question. The defendants tirelessly tried to establish that the narrow one and one half to two mile wide and eight mile long damage pattern northeast of their farm could not have resulted from their spraying operations, which occurred seven and one-half miles from the nearest cotton farm. Extensive testimony on wind direction and velocity was presented to the jury on this point, but the Texas Supreme Court concluded that the jury verdict against defendant was sufficiently grounded in the evidence so as to preclude reversal.85

Another inconsistency focused on by the defendants in Pitchfork Land was the delay between the time that the damage should have occurred as established by expert testimony and the time that farmers reported the herbicide damage. Experts concluded that the damage should have been present seven to ten days after the spraying, yet the plaintiffs did not observe the harmful effects until approximately sixteen to eighteen days later. The Texas Supreme Court dismissed this argument by noting that damage could have occurred on time, but the farmers would not have been looking closely enough for such effects to be noticed.86

Another Texas case directly on point is Leonard v. Abbott.87 The trial judge rested his causation finding on a

85 Id. at 602.
86 Id. at 600.
87 357 S.W.2d 778 (Tex. Civ. App.—Texarkana 1962), rev’d on other grounds, 366 S.W.2d 925 (Tex. 1963); see also Aerial Sprayers, Inc. v. King, 317 S.W.2d 602, 604-06 (Tex. Civ. App.—Amarillo 1958, no writ) (court admitted evidence of weather conditions to establish drift in support of plaintiff’s allegation of negligence); Aerial Sprayers, Inc. v. Yerger, Hill & Son, 306 S.W.2d 433, 435-36 (Tex. Civ. App.—Austin 1957, no writ) (plaintiff need only show evidence of herbicide damage to the crop, no other spraying in the area, and the occurrence of damage after spraying to satisfy burden of causation).
combination of circumstantial evidence. Defendants applied a herbicide by aerial spraying in winds of ten to twenty-five miles per hour blowing toward plaintiff's crops. A herbicide such as that used by defendant damaged plaintiff's crops in a swath originating at plaintiff's property line. Defendant's application of the herbicide was the only one in the area in this time period. The appellate court affirmed the judgment for the plaintiff, stating that although the evidence was circumstantial, it was sufficient.

2. Soybeans

The chemicals that damage cotton plants cause similar injury to the broad-leaf plant, soybean. One of the more interesting causation cases involved damage to a soybean crop allegedly caused by the aerial applicator. In Mayeux v. Cane-Air, Inc., a farmer engaged Cane-Air, an aerial applicator, to spray his soybeans with methyl parathion, an insecticide, and benlate, a fungicide. After the first two applications, the plaintiff-farmer noticed yellowing of his beans and complained to the applicator and his County Agent. Plaintiff sued and obtained a trial court verdict on the basis that phenoxy chemical had been improperly applied to his crop through Cane-Air's application of the insecticide and fungicide.

The litigants presented three possible explanations for how the phenoxy chemical could have reached the soybeans: (1) the methyl parathion was contaminated with the chemical; (2) residue from a prior spraying by Cane-Air remained in the tanks of the plane which sprayed Mayeux's field; and (3) Mayeux himself applied the phenoxy. The appellate court disposed of the first theory by noting that the trial court did not find the chemical company liable for contamination of the methyl parathion be-

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88 Leonard, 357 S.W.2d at 781.
89 Id.
91 Id. at 307.
cause all experts agreed that the quantity of contaminate in the insecticide could not have damaged the crop.\textsuperscript{92} Regarding the second argument, the plane used by Cane-Air to spray Mayeux’s field did apply a phenoxy chemical prior to spraying the field, however, this was not the immediately prior job. Louisiana state regulations requiring that aerial applicators flush their planes’ tanks and equipment when changing from a herbicide to an insecticide did not apply.\textsuperscript{93} No testimony was heard on the exact process used by Cane-Air on this particular job or its general policy.

The trial judge erred by concluding that the lack of testimony about the flushing of Cane-Air’s tanks before spraying Mayeaux’s field favored judgment for the plaintiff.\textsuperscript{94} Since this case did not involve damage to a neighboring property owner from aerial application, Louisiana’s strict liability rule did not govern.\textsuperscript{95} Plaintiff bore the burden of proving by a preponderance of the evidence that Cane-Air negligently caused the damage to plaintiff’s crops.\textsuperscript{96} Plaintiff testified that he personally applied a phenoxy chemical to the area around his field to combat weeds. Since it was just as likely that the damage occurred from the direct application of phenoxy to the field by Mayeux, the plaintiff did not carry his burden of proof.\textsuperscript{97}

3. Trees and Gardens

Two other Louisiana cases dealt with aerial applications that allegedly damaged trees or yards. In Williams v. Industrial Helicopters, Inc.,\textsuperscript{98} a property owner sued the aerial application service hired by an electric company to spray its right-of-way for damages to 120 trees subsequently

\textsuperscript{92} Id. at 309.
\textsuperscript{93} Id. at 311.
\textsuperscript{94} Id.
\textsuperscript{95} Id.
\textsuperscript{96} Cane-Air, 426 So. 2d at 307.
\textsuperscript{97} Id.
\textsuperscript{98} 519 So. 2d 1180, 1185-86 (La. Ct. App. 1988).
felled by the electric company. Plaintiff's theory was that the spraying by Industrial one month prior to the first felling of trees by the electric company provided the impetus to cut the dead trees. However, evidence of a southern pine beetle outbreak prior to this time frame provided another colorable theory behind why the trees died and had to be cut down. Also, the dead trees were surrounded by healthy vegetation. Therefore, plaintiff did not prove more likely than not that Industrial's spraying caused the damage in question, and the appellate court reversed the judgment.\textsuperscript{99}

In Augustine v. Dickenson,\textsuperscript{100} an aerial application of paraquat, a defoliant used to prepare fields for planting, drifted onto neighboring homes. Immediately after the spraying incident, the only such incident near the homes within this time frame, plaintiffs noticed tree leaves wilting and most other plants dying. An official of the Louisiana Department of Agriculture visited plaintiffs' homes and testified to the widespread defoliation typical of the effect of paraquat. The Augustine court upheld the lower court's decision that the defendant's spraying operation caused the plaintiffs' loss.\textsuperscript{101}

B. ANIMALS

1. Cattle

Plaintiff cattle owners have had a difficult time proving that aerial spraying of chemicals actually caused injury to their animals.\textsuperscript{102} In two cases on the subject, defendants

\begin{footnotes}
\item[99] Id. at 1186; see also Stirling v. Dixie Elec. Membership Corp., 344 So. 2d 427, 429 (La. Ct. App. 1977) (court held power company could spray chemicals from helicopters as long as it stayed within servitude); Kell v. Appalachian Power Co., 289 S.E.2d 450, 457 (W. Va. 1982) (court held that the power company did not have authorization to spray toxic herbicides by aerial broadcast spraying to clear right of way); Thad S. Huffman, Comment, \textit{Kell v. Appalachian Power Co.: Aerial Application of Herbicides on Utility Right-of-Ways}, 85 W. VA. L. REV. 995 (1983).
\item[101] Id. at 308-09.
\item[102] But see McPherson v. Billington, 399 S.W.2d 186, 191 (Tex. Civ. App.—Amarillo 1965, writ ref'd n.r.e.) (swine farmer recovered for death of hogs when
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prevailed each time. In *Watson v. Mid-Continent Aerial Sprayers, Inc.*, plaintiff sued the defendant for damage to his cattle allegedly caused by heptachlor, a fire ant poison. After application of heptachlor to defendant’s field, plaintiff found granules of the poison on his property. Subsequently, thirty-one cattle died and sixty-nine became ill. The symptoms of the sick and dying cattle were consistent with heptachlor poisoning. On the other hand, defendant’s numerous witnesses testified that heptachlor could not cause death or sickness in cattle. Furthermore, examinations of the deceased cattle did not disclose traces of heptachlor. On these facts, the appellate court found that plaintiff did not establish actual cause and could not recover.

Similarly, in *Gainey v. Folkman*, a cattleman sued a neighboring farmer to stop him from cropdusting on his property because of alleged damage to cattle and humans on his cattle ranch. Plaintiff alleged that the “dusting” drifted onto his property and his cattle ingested the spray on the alfalfa they ate resulting in an “unthrifty” condition. The aerial applications occurred in 1951 and 1952. Plaintiff reported no deleterious effects from the 1952 spraying. The only direct effect of the spraying was smarting of the eyes when the spray reached persons at the cattle ranch. Plaintiff’s foreman’s wife, who alleged aggravation of a preexisting condition because of the spraying, was not tested for toxic effects. A nationally recognized toxicologist and a biochemist both testified that the amounts of DDT (dichloro-diphenal-trichloroethane), Ben-Hex (benzine hexachloride) and parathion used for cropdusting were not likely to cause harm in warm-

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105 Id. at 151-52.
107 Id. at 232.
blooded animals or humans. Autopsies confirmed that the amount of DDT found in two dead animals could not fatally injure them.\textsuperscript{108} Overall, the plaintiff’s evidence did not preponderate in order to permit recovery.\textsuperscript{109}

2. Bees

Historically, one of the creatures most affected by aerial application of chemicals has been bees.\textsuperscript{110} Of course, since insecticide use targeted eradication of all insects, the chemicals did not always discriminate between the valuable bees and pests. Causation in these cases was linked to liability. If the plaintiff proved that the spraying actually reached his bee apiaries on initial application of the chemical, he usually would recover.\textsuperscript{111} If the bees died because of poison they encountered on foraging on defendant’s land, the defendant would get the judgment.\textsuperscript{112} Insecticides now can discriminate between bees and other insects, leaving the bees unharmed.

C. Aquaculture

The Gulf South region in recent years has increasingly relied on farming operations to produce seafood formerly only available by fishing or boating. The drift of toxic herbicides and insecticides to water life through ordinary drainage is almost unpreventable. Several cases document damage to water life caused by aerial application of chemicals.\textsuperscript{113}

\textsuperscript{108} Id.
\textsuperscript{109} Id. at 240.
\textsuperscript{111} See, e.g., Fricker, 27 P.2d at 679; Miles, 73 P.2d at 1261.
\textsuperscript{112} See, e.g., Jeanes, 211 P.2d at 925; Lenk, 213 P.2d at 49.
In *Kentucky Aerospray, Inc. v. Mays*, a commercial minnow dealer sued a farmer for the destruction of 150,000 to 170,000 minnows stored in a pond adjacent to the farmer's tobacco field. The pond was 110 feet away from the tobacco. A sample of water from the pond taken one day after the spraying found 1.5 parts toxaphene to every million parts water, a level which is toxic to fish. Plaintiff and a neighbor, though they did not actually see the chemical spray fall into the water, saw mist from the aircraft doing the spraying, and the fumes were so bad near the pond as to force them inside. The court found causation was satisfied.

*D & W Jones, Inc. v. Collier* presented some advance warning of the liability and causation factors in future toxic tort cases. D & W Jones, Inc. operated catfish farms at two locations in Washington County, Mississippi. Each of the farms suffered damage allegedly from agricultural chemicals that killed the fish. The catfish farmer, in two separate suits, sued various farmers and their aerial application agents for the injuries incurred at the respective catfish farms. The trial court promptly dismissed these suits due to misjoinder of parties and causes of action.

The Mississippi Supreme Court reversed the trial court. The court found that the aerial applications of the toxaphene by each individual farmer named in the suit probably could not alone have contaminated the ponds. The court held, however, that the cumulative effect of the successive individual applications of toxaphene by the neighboring farms could result in a single.

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114 251 S.W.2d 460 (Ky. Ct. App. 1952).
115 Id. at 461.
116 Id. at 462.
117 372 So. 2d 288 (Miss. 1979).
118 Id. at 292-94.
119 Id. at 288.
120 Id. at 294.
121 Id. at 293.
indivisible injury to the catfish farms.\textsuperscript{122} The court ruled that each of the farmers knew or should have known that the other farmers were applying toxaphene in the area and that a five parts per million concentration in the catfish ponds would contaminate the ponds.\textsuperscript{123} The court remanded the cases for trials on the merits.\textsuperscript{124} The \textit{D \& W Jones, Inc.} decision could foreshadow litigation in which farmers, aerial applicators and manufacturers are held jointly and severally liable for cumulative toxic effects to rivers, groundwater, humans, and animals.\textsuperscript{125}

The Louisiana decision \textit{South Lafourche Crawfish Farm, Inc. v. Cajun Flying Service, Inc.},\textsuperscript{126} again showcased a situation in which a customer sued an aerial applicator for negligence.\textsuperscript{127} The crawfish farmer allegedly contracted with the aerial applicator to kill only broad-leaf vegetation in the crawfish ponds. The aerial applicator consulted with a chemical company who recommended Weed Master, a general purpose herbicide composed of 2,4-D, Amine, and Banvel. After the aerial applicator completed the job, the crawfish farmer sued claiming the chemical killed all of the vegetation in the ponds, and the resulting decay deprived the ponds of oxygen.\textsuperscript{128} The crawfish ponds produced no crawfish the next year.

The Louisiana court of appeals found that even assuming that the oxygen depletion from the aerial application caused the crawfish to leave the pond, the aerial applicator could not be held liable.\textsuperscript{129} The aerial applicator accomplished its goal: to kill the vegetation. Overall, the heart of plaintiff's complaint, that the requested use of only 2,4-D would not have killed all of the vegetation, was

\textsuperscript{122} \textit{D \& W Jones, Inc.}, 372 So. 2d at 294.
\textsuperscript{123} \textit{Id.}
\textsuperscript{124} \textit{Id.}
\textsuperscript{125} See supra notes 3-5 and accompanying text.
\textsuperscript{127} \textit{Id.} at 1272.
\textsuperscript{128} \textit{Id.} at 1272-73.
\textsuperscript{129} \textit{Id.}
not proven at trial.\textsuperscript{130} The plaintiff never proved that the 2,4-D would have killed less vegetation and caused less oxygen depletion than the Weed Master.\textsuperscript{131} Also, other factors could have caused the pond failure.\textsuperscript{132}

D. Humans

One of the first reported cases involving injury to humans allegedly caused by aerial application of chemicals was \textit{Lawler v. Skelton}.\textsuperscript{133} The plaintiff, Lawler, was welding at his cotton gin adjacent to defendant's field, which was being sprayed with malathion and endrin. On a pass over the field the pilot covered the plaintiff and his assistant with the liquid. The chemicals got into plaintiff's mouth, nose and throat and covered his back, neck and face. The plaintiff immediately choked and had trouble catching his breath. Although he became dizzy and nauseated, he continued to work that afternoon. That night plaintiff became ill, but he went to work the next day. Several hours later his fever went up, and he went into a coma. Malathion and endrin are undisputedly extremely toxic to humans.\textsuperscript{134} Although there was some evidence of plaintiff's preexisting conditions, i.e. emphysema and bronchitis, the court noted that the great weight of the evidence showed that the direct spraying of plaintiff by the aerial applicator caused his illness.\textsuperscript{135} Therefore, the Mississippi Supreme Court reversed the jury verdict against the plaintiff.\textsuperscript{136}

A Louisiana case, \textit{Mangham v. Mid-Continent Aircraft Corp.},\textsuperscript{137} presented the scenario of a family home sprayed by an aerial applicator. Plaintiffs, Mangham, his family, and his friends, were at the home and came into direct

\begin{itemize}
\item \textsuperscript{130} \textit{Id.} at 1273.
\item \textsuperscript{131} \textit{Id.}
\item \textsuperscript{132} \textit{Id.} The court did not mention the other possible factors.
\item \textsuperscript{133} \textit{Id.} 130 So. 2d 565 (Miss. 1961).
\item \textsuperscript{134} \textit{Id.} at 568.
\item \textsuperscript{135} \textit{Id.} at 568-69.
\item \textsuperscript{136} \textit{Id.} at 569.
\item \textsuperscript{137} 284 So. 2d 347 (La. Ct. App. 1973).
\end{itemize}
contact with the herbicide. They alleged that, after this occurrence, a recurrent rash appeared on parts of their bodies causing pain, mental anguish, disfigurement, and disability. The jury at the trial court level denied all of plaintiffs' personal injury claims but awarded $1000 in property damages. Evidently, the plaintiffs' doctor convinced the jury that scabies or mite bites caused the condition, not an allergic reaction to a herbicide.

In *Ford v. Shallow Airport*, plaintiffs asserted that the parathion applied by defendant to an adjacent farm drifted onto their peach orchard. After presentation of all the evidence by each side, the defendant obtained a directed verdict. Plaintiff, Ms. Ford, testified that she became nauseated while harvesting peaches in their orchard and later when she was processing the peaches, she became violently ill. The defect in the plaintiffs' case was that they had not presented any specific evidence that drift onto their property had occurred. The evidence reflected that neither of the plaintiffs saw the plane pass over their home, saw a pesticide drift, or smelled an odor. Furthermore, the defendant pilot testified that drift under the climatic conditions present would only result in a maximum drift of twenty-five feet. Plaintiffs' home was several hundred feet from the spraying.

Finally, two other cases involve aerial applicators physically hitting their flagmen with their planes. Proper procedure in aerial application sometimes requires a flagman who guides the plane in its operation. The flagman is supposed to take fourteen steps away from his previous position in the same direction after each pass. The *Cannon v. Jones* decision turned on the jury finding that

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138 *Id.* at 348.
139 *Id.*
140 *Id.*
141 492 S.W.2d 655 (Tex. Civ. App.—Amarillo 1973, writ ref'd n.r.e.).
142 *Id.* at 657.
143 Riddle v. Little, 488 S.W.2d 34, 36 (Ark. 1972); Cannon v. Jones, 377 So. 2d 1055, 1056 (Miss. 1979).
144 *Riddell*, 488 S.W.2d at 36; *Cannon*, 377 So. 2d at 1056.
plaintiff's contributory negligence was the proximate cause of his death when struck by the aerial applicator. Plaintiff moved only two, not the required fourteen, steps away from his previous position. Defendant pilot, following the standard procedure of watching for electric wires, could not see plaintiff and thus hit him. The Riddell v. Little decision's pivotal finding was that the aerial applicator pilot's failure to have a license did not justify, on its own, an instruction to the jury that it is evidence of negligence. In order to submit that issue to the jury, a causal link between the lack of licensing and the alleged injury must exist. The court reversed and remanded the case because of a faulty jury change.

IV. DAMAGES

Several jurisdictions throughout the south and west agree on the following measure of recovery for crop damages. First, assess the market value of the estimated crop before the aerial application damage occurred. Next, determine the actual value of the product produced after damage. From the difference of these two figures, subtract the costs of marketing, harvesting, or transporting the produce to market. This number represents an estimate of damages incurred.

Variations in achieving these calculations exist as well. Arkansas courts condemn utilizing previous annual yields in order to establish what the probable yield would have been without aerial application damage. Louisiana, on the other hand, averages the yields of prior years in order

145 Cannon, 377 So. 2d at 1058-59.
146 Riddell, 488 S.W.2d at 39.
147 Id.
148 Id.
150 J.L. Wilson Farms, 590 S.W.2d at 45.
to assess the estimated value of an uninjured crop. Of course, almost every court agrees that these figures are only approximate. If the plaintiff successfully proves the defendant’s fault, the court should exercise great liberality and discretion so as not to deprive the plaintiff from a remedy for lack of exact proof.

In *DeVane v. Smith*, the defendant charged that the jury’s calculation of damages could not be correct because plaintiff offered no proof of his costs thereby omitting facts necessary to that calculation. The Georgia court of appeals ruled that plaintiff’s evidence of the “character of the soil, the condition of the crop prior to injury, the character of the cultivation of the cotton crop, the actual yield of the cotton crop, the probable yield of the cotton crop, the nature of the seasons, and comparisons with prior crops on the same land” authorized the jury to reach a figure as to the amount of lost profits. Likewise in *Augustine v. Dickenson*, when garden produce was damaged by aerial application, plaintiff’s evidence on the types of vegetables produced, row length, expected yield, and wholesale values furnished sufficient quantitative proof to estimate damages.

In *Schultz v. Harless*, extrapolation of later year’s yields was sufficient to estimate damages despite three differences: (1) the weather was much harsher in the year of aerial application; (2) the farmers were different; and (3) the type of cotton planted was also different. In *Lowe v. E.I. duPont de Nemours & Co.* the plaintiff testified that “it costs just as much to harvest a poor acre of beans as it

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151 Jones, 96 So. 2d at 112.
152 Lowe, 802 F.2d at 311; Augustine v. Dickerson, 406 So. 2d 306, 308-09 (La. Ct. App. 1981); Boyett, 456 S.W.2d at 702; Schultz, 271 S.W.2d at 697-98.
154 Id. at 712.
156 Id. at 308.
158 Id. at 698.
159 802 F.2d 310 (8th Cir. 1986).
does a good acre of beans." Based on this testimony, the court sustained a jury verdict that did not subtract harvesting costs from lost profits. In calculation of damages, any other compensation received by the farmer must be deducted from the award.

Injury to animals allows damage awards on much the same basis. In *S.A. Gerrard Co. v. Fricker*, compensating a plaintiff for damage to his bee apiaries required assessment of the market value of the apiaries before injury minus the value after rebuilding certain apiaries plus compensation to plaintiff for the rebuilding and clean-up and stop-gap expenses incurred by plaintiff to mitigate his damages. In *Eubanks v. Gore*, the Louisiana court calculated damages to cattle by establishing a list of animals and their weights and determining their value lost if injured or killed according to daily cattle market reports of the area.

While punitive damage awards in aerial application litigation appear to be nonexistent or unreported, in *SKF Farms v. Superior Court*, a California court of appeal declared that, at least on the pleadings, if proved, an aerial application injury might warrant punitive damages. Statutory provisions should be examined within each jurisdiction for application of punitive damages in these types of cases. For instance, Louisiana Civil Code article 2315.5 specifically permits exemplary damages: "If it is proved that plaintiff’s injuries were caused by the defendant’s wanton or reckless disregard for public safety in the storage, handling, or transportation of hazardous or toxic

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160 Id. at 311.
161 Id.
162 J.L. Wilson Farms, 590 S.W.2d at 46 (deducting a farmer’s disaster corporation check from the damage award).
163 27 P.2d 678 (Ariz. 1933).
164 Id. at 681.
166 Id. at 261.
168 Id. at 500.
V. INDEMNIFICATION FOR LIABILITY

Once a plaintiff establishes liability, causation, and damages, the defendants then concentrate on their individual liability. Culpable parties who may provide opportunity for indemnification are the farmer or landowner whose property is sprayed, the aerial applicator, the manufacturer of the pesticide and various insurers.

A. AERIAL APPLICATORS AS INDEPENDENT CONTRACTORS

In many cases, the aerial applicators and the farmers or landowners who contract their services are jointly and severally liable for any damages caused by aerial application. In Louisiana, the strict liability principle discussed earlier assures that the landowner who conducts cropdusting on his property becomes solidarily liable with his agent or contractor, namely the aerial applicator, to the person injured. Of course, even in this scenario, if one party can prove the negligence of the other in causing plaintiff's injury, it is possible for that party to exonerate himself from liability by indemnification.

Common law jurisdictions ordinarily dictate that persons are not liable for the torts of their independent contractors. An exception to this general rule exists for one who employs a contractor to carry on an inherently or intrinsically dangerous activity. In essence, this excep-

170 See infra notes 172-178 and accompanying text.
171 See supra notes 50-56 and accompanying text.
172 Russell v. Windsor Properties, Inc., 366 So. 2d 219, 223 (La. Ct. App. 1978) (citing Gotreaux v. Gary, 94 So. 2d 293 (La. 1957); D'Albora v. Tulane University, 274 So. 2d 825 (La. Ct. App. 1973)). Solidary obligations are analogous to joint and several liability but evolve from codal obligations found in Louisiana Civil Code Article 1794: "An obligation is solidary for the obligor when each obligor is liable for the whole performance. A performance rendered by one of the solidary obligors relieves the others of liability toward the obligee." LA. CIV. CODE ANN. art. 1794 (West 1987).
173 Boroughs, 337 So. 2d at 342.
174 Id.
tion strives to prevent negligence by giving incentives to employers to oversee their contractor’s work, if at all possible. Therefore, the exception to the rule posits that any liability arising out of inherently dangerous activities is nondelegable.175 The employer and the independent contractor are jointly and severally liable for torts committed by the independent contractor.176 At the same time that courts declare cropdusting to be an inherently dangerous activity, they paint a fine line between inherently dangerous activities and ultrahazardous activities. Cropdusting is usually the former but not the latter.177

Thus, in most cases, a plaintiff can count on not only the aerial applicator (independent contractor) as a liable defendant but the landowner-farmer (employer) as well. Of course, if the aerial applicator negligently injures a neighboring landowner through his operations, the aerial applicator may have to indemnify his farmer-employer.178

B. Manufacturer Liability

Generally, aerial application litigation against manufacturers involves two separate genres. In one type of case, the plaintiff alleges that a chemical is defectively manufactured or incorrectly labelled. The other type of case asserts that the manufacturer breached an implied or express warranty. In both scenarios a verdict against the defendant/manufacturer offers the plaintiff another deep pocket to compensate him for his injury.

175 Id.; Emelwon, Inc. v. United States, 391 F.2d 9, 11 (5th Cir. 1968) (applying Florida law).
176 See Frazier v. Moeller, 665 S.W.2d 155, 157-58 (Tex. App.—Eastland 1983, writ dism’d); Gragg v. Allen, 481 S.W.2d 452, 454 (Tex. Civ. App.—Waco 1972, writ dism’d); Leonard, 357 S.W.2d at 782. But see Pitchfork Land, 346 S.W.2d at 604 (holding an aerial applicator as an independent contractor distinguished out of relevance by later opinions).
177 Boroughs, 337 So. 2d at 343; Ligocky v. Wilcox, 620 P.2d 1300, 1301-02 (N.M. Ct. App. 1980); Bennett v. Larsen Co., 348 N.W.2d 540, 553 (Wis. 1984).
One of the first cases in which a defendant impleaded a chemical manufacturer into aerial application litigation was *Chapman Chemical Co. v. Taylor.* In this dispute, plaintiff's cotton was damaged by defendant's aerial application of 2,4-D to defendant's rice crop. The Arkansas Supreme Court affirmed the trial court verdict for the defendant rice farmer because it found no negligence on his part. Chapman, however, was found liable for plaintiff's injury because the company did not adequately test its product to accurately determine its capacity to drift when applied. The company had agreed that it was not aware of the product's drift characteristics; however, the Arkansas Supreme Court found that strict liability governed this case and charged Chapman with the knowledge that tests of its products would have revealed.

Later cases do not charge a manufacturer with strict liability but rather use a negligence standard of care. A breach of this standard of care by a manufacturer can be inferred from circumstantial evidence via the doctrine of *res ipsa loquitur.* This theory enables plaintiffs to get to the jury by proving that there was injury to their property that does not normally occur without negligence and that the defendant/manufacturer controlled the instrumental-ity that may have harmed the plaintiff. In *Tide Products, Inc. v. Browning,* the plaintiff won a jury verdict, and the Texas court of appeals affirmed the verdict on the basis of plaintiff's proof that his peanut crop died after being sprayed with chemicals contaminated by residues in the sprayer's equipment. The peanuts died in a pattern consistent with the residue causing the damage — in

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179 222 S.W.2d 820 (Ark. 1949).
180 Id. at 825.
181 Id. at 827.
182 Id.
184 493 S.W.2d 654 (Tex. Civ. App.—Amarillo 1973, writ dism'd by agr.).
185 Id. at 655.
swaths as applied by a plane and decreasing in severity the further away from the point of initial application.

Nevertheless, plaintiffs still must prove that a manufacturer has breached a standard of care, a burden that several plaintiffs could not carry. In *Potmesil v. E.I. duPont deNemours Co.*, plaintiff charged that the manufacturer should have labelled its liquid chemical to clearly warn farmers that the liquid was twice as strong as its powder form. The Louisiana court of appeals flatly rejected this contention and reversed the trial court's finding that the label was confusing. A thorough examination of the instructions on the label of the product and the farmer's experience in using chemicals convinced the court that the farmer and not the manufacturer was at fault in this case.

Likewise, in *Asgrow-Kilgore Co. v. Mulford Hickerson Corp.* and *Rayner v. Stauffer Chemical Co.*, plaintiffs charged that a chemical damaged their crops but could not establish by the weight of the evidence that the defendant's chemical caused the damage. In *Asgrow-Kilgore*, the plaintiff cultivated caladiums, a type of ornamental plant. Plaintiff presented evidence that spraying by a neighbor adversely affected the crop, but other evidence showed that the crop was substandard before the spraying occurred. The Florida Supreme Court, therefore, ruled that the trial court could have found that the neighbor's spraying was a cause, but not a proximate cause, of the damage to plaintiff's crops. The court then reversed the Florida district court of appeal and reinstated the trial court's finding of no liability.

186 408 So. 2d 315 (La. Ct. App. 1982).
187 Id. at 320.
188 Id. at 319.
189 Id.
190 301 So. 2d 441 (Fla. 1974).
192 *Asgrow-Kilgore*, 301 So. 2d at 442-43; *Rayner*, 585 P.2d at 1247.
193 *Asgrow-Kilgore*, 301 So. 2d at 444.
194 Id.
195 Id.
In Rayner, plaintiff planted a potato crop and prepared his land for that crop in advance with various chemicals.\textsuperscript{196} The plants began to develop in an abnormal fashion. After consultation with his county agricultural extension agent, plaintiff attempted to isolate the chemicals that damaged his potatoes. The next year he treated some of his acreage with both Eptam, a herbicide manufactured by Stauffer, and Telone, an insecticide made by Dow Chemical, and the rest solely with Telone. Once again, plaintiff's potatoes appeared abnormal, and plaintiff asserted that this only occurred on the fields treated with Eptam.\textsuperscript{197} Plaintiff sued Stauffer, the manufacturer of Eptam.

In a battle of experts, the defendant displayed to the jury that the kinds of damage Eptam could cause to plants were different from the damage to plaintiff's potatoes.\textsuperscript{198} Several experts with extensive experience growing potatoes in other areas of the country also testified that Eptam never damaged their potatoes.\textsuperscript{199} The jury found in favor of defendant.\textsuperscript{200} On appeal, plaintiff challenged various pieces of evidence that the trial court allowed before the jury. The Arizona court of appeals found that the experts' testimony was correctly allowed into evidence by the trial court and upheld the jury verdict.\textsuperscript{201}

The second genre of cases against chemical manufacturers in aerial application litigation involves claims of breach of warranty by the manufacturer.\textsuperscript{202} These opinions wrestle with interpretation of the various state enactments of the Uniform Commercial Code. In general, these cases are based on the chemical product's non-com-
pliance with the conditions, warranties, or warnings which the manufacturer placed on the chemical product label. For instance, in *Burr v. Sherwin Williams Co.*, the labels of the product DDTOL, supplied to the plaintiff, did not notify consumers that the ten percent inert ingredients of the chemical contained another chemical, 2,4-D. The fact that the 2,4-D killed the plaintiff's cotton crop was the essence of plaintiff's cause of action.

Two cases dealing with Texas law have delineated the U.C.C.'s application to chemicals applied by aerial applicators. In *Elanco Products Co. v. Akin-Tunnell*, a Texas court of appeals mandated that to maintain a cause of action for breach of warranty, plaintiff must show compliance with the express conditions on the chemical's label instructions. The plaintiff's application of the herbicide in greater than five mile per hour winds and failure to mix the herbicide with five to ten gallons of water per acre contradicted the instructions given by the manufacturer. The plaintiff therefore recovered nothing.

In *Lindemann v. Eli Lilly & Co.*, the United States Fifth Circuit Court of Appeals, applying Texas law, affirmed a judgment for the plaintiff based on breach of a manufacturer's express warranty. Recovery of any damages is premised on compliance with label instructions as in *Elanco Products*. The *Lindemann* court first concluded that the plaintiff's "split" application of the herbicide was not inconsistent with label instructions. The court then acknowledged other possible causes of the excessive weeds in the Lindemann fields but affirmed the jury find-

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203 *Burr*, 268 P.2d at 1041.
204 *Id.* at 1049.
205 *Id.* at 1043.
206 516 S.W.2d 726 (Tex. Civ. App.—Amarillo 1974, writ ref'd n.r.e.).
207 *Id.* at 731.
208 *Id.*
209 816 F.2d 199 (5th Cir. 1987).
210 *Id.* at 202.
211 *Id.* at 201.
212 *Id.*
ing of a breach of an express warranty.\footnote{Id. at 202.}

The trial court found that the manufacturer’s consequential damages limitation of the refund of the purchase price was unconscionable.\footnote{Lindemann, 816 F.2d at 203.} The Fifth Circuit reversed the trial court on this issue.\footnote{Id.} The Fifth Circuit found that section 2-719(3) of the U.C.C. allowed limitation of consequential damages if a loss is in a commercial context.\footnote{Id.} Additionally, the court did not find any Texas case holding as unconscionable a clause in a contract that excluded consequential damages on a commercial product.\footnote{Id. at 204.} Therefore, the Fifth Circuit awarded the plaintiff $6000 in actual damages, effectively upholding the damages limitation.\footnote{Id. at 205.}

Finally, in \textit{Earl Brace \\& Sons v. Ciba-Geigy Corp.},\footnote{708 F. Supp. 708 (W.D. Pa. 1989).} the court held that a disclaimer on a chemical product enclosed in a booklet sold with every product operates to preclude consequential damages.\footnote{Id. at 710.} In this case, the plaintiff argued that such a disclaimer and limitation of damages was unconscionable, unenforceable, and contrary to section 2-316 of the U.C.C. The district court rejected these arguments and specifically noted that Pennsylvania section 2-316 only protects a buyer where the disclaimer is irreconcilable with an express warranty.\footnote{Id.} The district court granted summary judgment to the defendant/manufacturer because it found only a disclaimer and no express warranty was present.\footnote{Id.}

\section*{C. Insurance}

Various jurisdictions have faced questions of insurance law arising out of coverage disputes over aerial applica-

\footnotesize{\textsuperscript{213} Id. at 202. \textsuperscript{214} Lindemann, 816 F.2d at 203. \textsuperscript{215} Id. \textsuperscript{216} Id. \textsuperscript{217} Id. at 204. \textsuperscript{218} Id. at 205. \textsuperscript{219} 708 F. Supp. 708 (W.D. Pa. 1989). \textsuperscript{220} Id. at 710. \textsuperscript{221} Id. \textsuperscript{222} Id. at 711.}
tion in farmer insurance policies. Many of these cases only interpret insurance policies. The cases analyzed here are noteworthy because of their factual backgrounds.

In *Aerial Agricultural Service of Montana, Inc. v. Till*, a Mississippi federal district court analyzed an insurance policy to determine whether it covered the defective operation of a seeding device that the insured had invented. The insured utilized this device to aerially seed a client's fields. When the client sued claiming improper distribution of the seed in the field and was awarded a judgment, the question remained as to whether the aerial applicator's insurance policy would absorb the loss.

The basis of the insurance company's argument was that its policy covered only "occurrences," which the company defined as "accidents." The insurer argued that the insured aerial applicator purposely adjusted its own seed applicator and seeded the field improperly. This intentional adjustment of the applicator, continued the insurer, removed the situation from any classification as accidental. The court rejected this argument, holding the definition of "occurrence" to be ambiguous. Though Aerial intentionally created the situation with the malfunctioning seeder, it did not intend uneven seed distribution. Therefore, the "occurrence" language of the policy covered the insured's claim.

In *Willis v. Willis*, a Florida district court of appeal, denied a defendant's cross-claim against his insurer because the defendant/insured specifically declined chemical liability insurance in his application. Similarly, in *Emmco Insurance Co. v. Marshall Flying Service, Inc.*, an aerial applicator applied for chemical damage coverage, but the policy provided by the insurer did not cover that even-

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224 *Id.* at 55.
225 *Id.* at 57.
226 *Id.* at 59.
228 *Id.* at 303.
tuality. When the aerial applicator became involved in a chemical damage claim and had no insurance coverage, the aerial applicator still sued the insurer to cover the accident. The court found that the insured had applied properly for the chemical damage insurance coverage and that the insurance agent knew or should have known of the request. Therefore, the insurance company was found responsible for the damage caused by the aerial applicator.

In *Southern Farm Bureau Casualty Insurance Co. v. Adams*, a person was injured by methyl parathion sprayed by an aerial applicator. The insureds had a Farmer's Comprehensive Personal Insurance policy that excluded coverage "(c) to bodily injury or property damage arising out of the ownership, maintenance, operation, use, loading or unloading of: (1) any aircraft; . . . (n) to property damage arising out of any substance released or discharged from any aircraft." The insureds claimed that these exclusions only applied to aircraft that they personally operated, as opposed to aircraft operators with whom they contracted to spray their fields. The Texas court of appeals agreed with the insureds' argument by holding that bodily injury was covered so long as the insured plaintiffs did not themselves operate the plane. The court found, however, that exclusion (n) did operate to exclude property damage caused by an aerial application contractor.

In *Farm Flying Service v. Southeastern Aviation Services, Inc.*, plaintiff/insured sprayed the wrong crop. The insurance policy in question excluded "injury to or destruction of any crops, pastures, trees or tangible property to which the aerial application is deliberately made whether

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230 Id. at 454.
231 Id.
232 570 S.W.2d 567 (Tex. Civ. App.—Corpus Christi 1978, writ ref’d n.r.e.).
233 Id. at 568-69.
234 Id. at 571.
235 Id.
in error or not."\textsuperscript{237} A California court of appeal ruled that because this exclusion unambiguously precluded any liability on the part of the insurer, it was not liable.\textsuperscript{238}

In \textit{Leger v. St. Landry Aerial Applicators, Inc.},\textsuperscript{239} the plaintiff/insured claimed that the aerial applicator improperly mixed the chemicals and caused damage to his crops. The insurance policy excluded, "injury to or destruction of any property in or upon the field, adjacent field, area or premises owned, occupied, rented or in the care, custody or control of the farmer, owner or grower for whom the aerial application is being performed by the Insured."\textsuperscript{240} The court had no trouble affirming a summary judgment in favor of the insurer under these facts.\textsuperscript{241}

A more complex question arose in \textit{Little v. Kalo Laboratories, Inc.},\textsuperscript{242} where insurance coverage from chemical drift was at issue.\textsuperscript{243} The insurance policy excluded coverage for "the ownership, maintenance, or use, including the loading or unloading of . . . aircraft"\textsuperscript{244} yet the policy did cover the "accidental discharge, dispersal, release or escape of chemicals [and] damage to farm crops and livestock arising out of the application of farm chemicals. . . ."\textsuperscript{245} The court found that "[w]here the damage flows from the chemicals unrelated to use of the aircraft the risk is one clearly intended to be covered as reflected by the language of exclusion (m) and the aircraft use exclusion is inapplicable."\textsuperscript{246} Because potential causes of the chemical damage to a neighboring farm could have been granulization or volatilization, a factual issue remained for resolution at trial, and summary judg-

\textsuperscript{237} Id. at 2.
\textsuperscript{238} Id. at 3.
\textsuperscript{239} 399 So. 2d 760 (La. Ct. App. 1981).
\textsuperscript{240} Id. at 761.
\textsuperscript{241} Id. at 762.
\textsuperscript{243} Id. at 679.
\textsuperscript{244} Id. at 680.
\textsuperscript{245} Id.
\textsuperscript{246} Id. at 682.
ment was inappropriate.247

VI. REGULATORY CONTROL BY FEDERAL AND STATE GOVERNMENTS

Federal and state governmental entities exercise control over the aerial application industry in two areas: regulation of aviation and regulation of pesticides. The FAA's regulation of agricultural aircraft application of pesticides applies throughout the United States and sets minimum standards for pilots and their aircraft.248 The FAA requires all aerial applicator pilots to hold an agricultural aircraft operator certificate.249 Application for a certificate is made according to procedures formulated by the FAA District Office that has jurisdiction over the area.250 To receive a certificate, the applicant must be certified, airworthy, and equipped for agricultural operation.251 Moreover, the applicant must already have a current U.S. commercial or airline transport pilot certificate252 and must prove knowledge of pre-starting operations, safe handling of economic poisons, and safe operation of the aircraft.253 The FAA regulations also mandate certain minimum operating standards of height and areas of operation.254

The FAA regulations specifically mandate that economic poisons dispensed or applied by holders of agricultural aircraft operator certificates must be registered with the United States Department of Agriculture under the Federal Insecticide, Fungicide, and Rodenticide Act

247 Id. at 683.
249 Id. § 137.11.
250 Id. § 137.15.
251 Id. § 137.19(d).
252 Id. § 137.19(b)-(c).
253 Id. § 137.19(e)(1)(i)-(ii).
254 Id. §§ 137.43, 137.45, 137.49, 137.51, 137.53; see also Cannon v. Jones, 377 So. 2d 1055, 1057 (Miss. 1979) (when aerial applicator plane struck flagman on ground, plaintiff unsuccessfully attempted to predicate liability based on per se violation of FAA regulation prohibiting the creation of hazards to persons on ground).
(FIFRA). In Oregon Environmental Council v. Kunzman, the Ninth Circuit rejected an environmental group’s attempt to stop aerial spraying of land near an urban area based on alleged violations of the FAA requirement that economic poisons aerially applied must comply with FIFRA. The court found that before spraying near a residential area, FIFRA requires an Environmental Impact Statement to satisfy administrative policy. The FAA and FIFRA statutes on which plaintiffs relied commanded operators of aerial applicators to follow label instructions on economic poisons. In this case, the label warned consumers to “avoid breathing of spray and contact with skin and eyes.” The Ninth Circuit ruled that no violation of FIFRA occurred, and therefore it did not reach the question of whether FIFRA created a private right of action for citizens.

Every applicator in the United States must comply with FIFRA under FAA regulations. FIFRA now governs the use, sale, and labeling of regulated pesticides produced and sold in intrastate and interstate commerce. Additionally, in conjunction with the Environmental Protection Agency, state governments increasingly maintain FIFRA enforcement authority as well as pesticide, economic poison, and aerial application regulations of their own. The recent U.S. Supreme Court decision in Wisconsin Public Intervenor v. Mortier also guarantees that local governmental authorities may regulate aerial applicators in the future.

256 714 F.2d 901 (9th Cir. 1983).
257 Id. at 904.
258 Id. at 906.
259 Id. at 905.
260 Id. at 904.
264 Id. at 2486-87.
In Mortier, a local government in Wisconsin passed an ordinance requiring aerial applicators to apply for permission to spray within its boundaries according to specific procedures. When Mr. Mortier applied for permission to aerially spray his lands and was refused, he filed suit claiming that FIFRA and certain Wisconsin statutes preempted the local governmental body from regulation of pesticide use. The Supreme Court, in an opinion authored by Justice White, ruled that neither FIFRA nor its legislative history evidenced a congressional intention to exclusively regulate pesticide use. Therefore, the Supreme Court reversed the Wisconsin courts, which had declared that FIFRA and the Wisconsin statutes preempted action by local governments in this field.

At least in California, state enforcement agencies have utilized their state statutory and regulatory schemes to control aerial application closely. As early as 1928, California courts recognized that violation of state regulatory measures constituted negligence per se in tort litigation between neighboring landowners whose crops were damaged by drift. The California Department of Food and Agriculture has effectively pursued litigation for the revocation of aerial application licenses from pilots who violate the state regulation. In Holt v. Department of Food and Agriculture, the state authorities prosecuted a pilot and his employer for reckless or negligent violations of certain regulations. When the department fully documented its allegations against the aerial applicator, the California courts sustained the license suspension imposed by the

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265 Id. at 2487.
266 The Supreme Court decision effectively overruled other state supreme court decisions in People ex rel. Deukmejian v. County of Mendocino, 683 P.2d 1150 (Cal. 1984) and Central Maine Power Co. v. Town of Lebanon, 571 A.2d 1189 (Me. 1990).
267 See infra notes 268-272 and accompanying text.
270 Id. at 3.
department against the pilot and his employer.\textsuperscript{271} California aerial applicators and other applicators within states who have chosen to comprehensively regulate pesticides should be aware of the use of these regulations as the vehicles for tort liability as well as administrative penalties.\textsuperscript{272}

Finally, some state regulations mandate that landowners who sustain damage to their property must follow certain procedures in order to pursue tort litigation to recoup their damages. An Oklahoma statutory scheme states:

No action for such alleged damages to growing annual crops or plants may be brought or maintained, however, unless the person claiming the damages shall have filed with the Board a written statement of alleged damages, on a form prescribed by the Board, within ninety (90) days after the date that the alleged damages occurred, or prior to the time that twenty-five percent (25\%) of the crop damaged shall have been harvested.\textsuperscript{273}

In \textit{Short v. Jones},\textsuperscript{274} plaintiff's pecan trees were permanently damaged by a neighbor's aerial application of herbicide. The lower appellate court reversed the trial court's verdict for the plaintiff because the plaintiff did not follow the proper statutory procedure.\textsuperscript{275} The Oklahoma Supreme Court did not invalidate the statute as a jurisdictional prerequisite to a suit for annual crop damage in Oklahoma courts.\textsuperscript{276} Instead, since the damage to the trees could be termed damage to real property, the court rested its affirmance of the trial court's damage

\begin{footnotes}
\footnote{271 Id. at 7.}
\footnote{272 \textit{Accord} Bennett v. Larsen Co., 348 N.W.2d 540, 548 (Wis. 1984) (violation of state regulation by aerial applicator results in negligence per se liability); see also Sarah E. Redfield, \textit{Chemical Trespass? - An Overview of Statutory and Regulatory Efforts to Control Pesticide Drift}, 73 Ky. L.J. 855, 885-87 (1985) (encyclopedic examination of state pesticide regulatory measures).}
\footnote{273 OKLA. STAT. ANN. tit. 2 § 3-82(d) (West Supp. 1992).}
\footnote{274 613 P.2d 452 (Okla. 1980).}
\footnote{275 Id. at 454.}
\footnote{276 Id.}
\end{footnotes}
award on a separate basis — damage to realty.\textsuperscript{277} Oklahoma thus mandates strict adherence to its statutory scheme; otherwise plaintiff’s case can be dismissed on a demurrer.\textsuperscript{278}

In contrast to the jurisprudence of Oklahoma, Kansas recently completely invalidated its statutory scheme which stated:

In order to maintain a civil action, a person damaged from pesticide application shall have filed with the county attorney of the county in which the damage occurred, a written statement, on a form prescribed by the secretary, claiming that he or she has been damaged. Such form shall be filed within sixty (60) days after the date damage was discovered. Such statement shall contain, but shall not be limited to, the name of the person responsible for the application of said pesticide and/or the name of the owner or lessee of the land on which it is alleged that the damage occurred . . . .\textsuperscript{279}

In \textit{Ernest v. Faler},\textsuperscript{280} plaintiff’s walnut trees were damaged by pesticide drift from an aerial application on a neighbor’s crops. The defendant secured a summary judgment at the trial level by pointing out plaintiff’s failure to file a report with the county attorney, although plaintiff did file a report with the secretary of agriculture, the adjacent landowner, and the defendant pesticide applicator.\textsuperscript{281} The Kansas Supreme Court struck down the law as a violation of the United States and Kansas constitutional guarantees of due process and equal protection.\textsuperscript{282} The court determined that the statute unreasonably deprived a citizen of a right through means that do not have a real or substantial relationship to the

\textsuperscript{277} \textit{Id.} at 455.
\textsuperscript{278} \textit{Id.} at 454; \textit{see also} Schroeder Aviation, Inc. v. De Fehr, 283 N.W.2d 147, 152 (N.D. 1979) (jurisdictional statutory prerequisite to pesticide claim upheld as constitutional).
\textsuperscript{279} KAN. STAT. ANN. § 2-2457 (1979) (repealed 1986).
\textsuperscript{280} 697 P.2d 870 (Kan. 1985).
\textsuperscript{281} \textit{Id.} at 871-72.
\textsuperscript{282} \textit{Id.} at 879.
objective sought: notification of involved parties in a timely manner.\textsuperscript{283} Despite Kansas' rejection of statutes barring the maintenance of civil actions for failure to file a damage statement, North Dakota, Oregon, and Oklahoma still have such regulations.\textsuperscript{284}

\textbf{VII. CONCLUSION}

The field of aerial application of pesticides has provided our courts with many types of litigation. Overall, however, the liability of the industry has been restricted to responsibility for damage that can accurately be traced to immediate drift of the economic chemical. With the advent of more scientific evidence and investigative techniques to determine how certain chemicals get into groundwater or other areas where damage to persons or property can occur, the aerial application industry must carefully and closely monitor the courts in the next few years to assure that tenuous and speculative theories of liability do not cripple the economic viability of the industry.

The costs of pesticide drift should certainly be placed on those responsible, but ultimately the health of the aerial application industry is closely linked to the viability of American agriculture as a whole. Trace amounts of economic poisons should not be used to create liability for aerial applicators or the farmers they serve. Without specific evidence to prove causation and the parties responsible, the courts should refrain from holding the aerial application industry from specious and overwhelming liability. The person ultimately harmed will be the American consumer as such liability will translate into lower quantities of agricultural output and higher prices. Also, liability and the resulting higher production costs for American farmers could result in the transfer of more agricultural production outside the boundaries of the

\textsuperscript{283} Id. at 876-77.
\textsuperscript{284} Id. at 877-78.
United States. In that scenario, food stuffs produced in other nations are not subject to strict American controls of pesticides and quality.\textsuperscript{285}

\textsuperscript{285} Dow Chem. Co. v. Castro Alfaro, 786 S.W.2d 674 (Tex. 1990); \textit{cert. denied}, 111 S. Ct. 671 (1991) (foreign plaintiff sued chemical manufacturer for injuries that he received from DBCP, a pesticide used in his home country of Costa Rica but banned in the United States).