

**STATE OF MINNESOTA
IN COURT OF APPEALS
A12-1615**

Harlan Poppler, et al.,
Respondents,

vs.

Wright Hennepin Cooperative Electric Association,
Appellant.

Filed July 19, 2013
Affirmed in part, reversed in part, and remanded
Johnson, Chief Judge

Wright County District Court
File No. 86-CV-10-7728

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Considered and decided by Hudson, Presiding Judge; Johnson, Chief Judge; and
Willis, Judge.*

*Retired judge of the Minnesota Court of Appeals, serving by appointment pursuant to Minn. Const. art. VI, § 10.

SYLLABUS

1. A district court does not have authority under rule 49 or rule 52 of the Minnesota Rules of Civil Procedure to make additional findings on an issue that was submitted to the jury and on which the jury returned a verdict if the additional findings are unnecessary to enter a judgment.

2. A plaintiff seeking damages for lost profits must prove the existence and amount of the plaintiff's decrease in revenues as well as the existence or non-existence and amount of any offsetting decrease in the plaintiff's expenses. A plaintiff seeking damages for a dairy farm's losses due to stray voltage is not entitled to damages solely upon proof of "milk loss" (*i.e.*, decreased revenues due to decreased milk production) without any evidence of the existence or non-existence and amount of any offsetting decrease in the plaintiff's expenses.

3. If a party does not object on the record to a jury instruction pursuant to rules 51.03 and 51.04 of the Minnesota Rules of Civil Procedure, this court may review the party's challenge to the jury instruction only for plain error.

4. The presence of stray electrical voltage does not give rise to a cause of action for trespass.

O P I N I O N

JOHNSON, Chief Judge

Harlan Poppler, Jennifer Poppler, and Roy Marschall (hereinafter the Popplers) operate a dairy farm. The Wright Hennepin Cooperative Electric Association provides electricity to the dairy farm. The Popplers sued Wright Hennepin, alleging that stray

electrical voltage injured their herd of dairy cows, thereby causing a decrease in the cows' production of milk. A Wright County jury found Wright Hennepin liable and awarded the Popplers \$753,200 in damages. After the district court's rulings on the parties' various post-trial motions, the district court remitted the damages award to \$715,200. Wright Hennepin appealed, and the Popplers filed a cross-appeal. The parties' appellate briefs raise a number of issues, both procedural and substantive. For the reasons stated below, we affirm in part, reverse in part, and remand for a new trial on the issue of damages.

FACTS

A. The Parties

The Popplers are experienced dairy farmers. Harlan Poppler grew up on a dairy farm in Carver County and began working on the dairy operation as a child. He married Jennifer Poppler (nee Marschall) in 2001, at which time he moved a herd of his dairy cows to a dairy farm in Scott County owned by her father, Roy Marschall. In 2003, the Popplers moved their collective herd to a dairy farm in Wright County. Since then, the Popplers have managed a successful dairy farm with a herd of approximately 200 cows.

The Wright Hennepin Cooperative Electric Association is an electric utility headquartered in the city of Rockford. Wright Hennepin provides electricity to the Popplers' dairy farm.

In late 2007 and early 2008, the Popplers noticed a decrease in their dairy herd's milk production and an increase in problems related to the health of the herd. Harlan Poppler was concerned and tried to determine the cause. He enlisted the help of assistant

herdsman Nathan Emery, veterinarian Shayne Marker, nutritionist Barry Visser, and artificial-insemination technician Kenny Bangasser, as well as Roy Marschall and Jennifer Poppler. Harlan Poppler testified that he and his team were able to rule out issues related to diet, water quality, overcrowding, herd management, and milking equipment. At some point, Harlan Poppler began to consider stray electrical voltage as a possible cause of the problems.

B. Stray Voltage

The supreme court has described stray voltage as “a phenomenon in which an electrical current—voltage that returns to the ground after powering an appliance—passes through an object not intended as a conductor.” *Siewert v. Northern States Power Co.*, 793 N.W.2d 272, 276 (Minn. 2011). This description comports with the parties’ general understanding of stray voltage, which also may be referred to as stray electricity or stray current. Other courts have expanded on the phenomenon of stray voltage and its potential to affect cows as follows:

All electricity leaving an electrical substation must return to that substation in order to complete a circuit. Unless that circuit is completed, electricity will not flow. The current leaves the substation on a high voltage line which eventually connects to some electrical appliance. After exiting the appliance that current must return to the substation. The neutral-grounded network provides the returning current two choices. Either it can return via the neutral line, which accounts for the second wire on our electrical poles, or it can return through the ground. These two pathways comprise the grounded-neutral network. Electricity flows through the path of lowest resistance. If there exists more resistance in the neutral line than in the ground, the current will flow through the ground to return to the substation. Neutral-to-earth voltage or stray voltage will occur when current moves from

either the neutral line to the ground or from the ground to the neutral line. It uses a cow as a pathway if that animal happens to bridge the gap between the two. A cow's hooves provide an excellent contact to the earth while standing on wet concrete or mud, while at the same time the cow is contacting the grounded-neutral system consisting of items such as metal stanchions, stalls, feeders, milkers, and waterers. The current simply uses the cow as a pathway in its eventual return to the substation.

Kaech v. Lewis Cnty. Pub. Util. Dist. No. 1, 23 P.3d 529, 533 n.3 (Wash. App. 2001) (quoting *Schlader v. Interstate Power Co.*, 591 N.W.2d 10, 12 (Iowa 1999) (quoting *Larson v. Williams Elec. Coop., Inc.*, 534 N.W.2d 1, 1-2 n.1 (N.D. 1995))), *review denied* (Wash. Jan. 10, 2002).

The parties to this case agree that the amount of electrical current to which dairy cows are exposed is relevant to the cow's health. The amount of electrical current is measured in terms of amperes and is determined by a formula known as Ohm's Law, which provides that current is equal to the amount of voltage divided by the amount of resistance of the material through which the current is conducted. Voltage is measured in terms of volts, and resistance is measured in terms of ohms.

The parties disagree about the amount of electrical current that is necessary to cause an adverse effect on the health of a dairy cow. The Popplers contend that dairy cows may be adversely affected by electrical current levels as low as 1 milliamperes. Meanwhile, Wright Hennepin contends that dairy cows are not adversely affected unless and until electrical current levels reach 4 milliamperes.

The parties also disagree about the amount of electrical current to which the Popplers' dairy cows actually were exposed and how the amount of current should be

calculated. Determining the amount of current flowing through a dairy cow's body requires information about the amount of resistance in a dairy cow's body. Resistance is an important variable in the calculation because it can alter the resulting measurement of current. For example, if voltage is 0.5 volts and resistance is 500 ohms, the current is 1 milliamperes. But if voltage is the same and resistance is only 200 ohms, the current is 2.5 milliamperes.

C. Relevant Events

At the suggestion of another dairy farmer who claimed to have experience with stray voltage, Harlan Poppler observed his dairy cows' drinking behavior. During the winter of 2007-2008, he noticed that his cows were behaving abnormally because they were "bobbing in and out of the water" and "licking at the water" rather than drinking it. Because this behavior was consistent with the presence of stray voltage, Harlan Poppler contacted Wright Hennepin and requested that it check for stray voltage.

In 2008, Wright Hennepin performed testing on the Popplers' farm to assess the report of a possible stray-voltage problem. Wright Hennepin determined that the Popplers did not have a stray-voltage problem or that, if there was a stray-voltage problem, it was a result of defective electrical wiring in buildings on the Popplers' dairy farm rather than a defect in Wright Hennepin's power-transmission lines. In light of this conclusion, the Popplers hired an electrician, Kyle Osmek, to rewire the buildings used in the dairy operation. But the rewiring did not resolve the herd's health problems, and the herd continued to exhibit abnormal behavior.

In 2009, the Popplers retained John Ritchie, a stray-voltage consultant, to perform electrical testing on the dairy farm. Ritchie recommended that the Popplers upgrade the electrical system “so that the returning earth current from the primary neutral [line] doesn’t pass through [the] dairy facility on its way back to the prospective substation.” Ritchie’s recommendation required both the Popplers and Wright Hennepin to take steps to upgrade the system. Specifically, the Popplers needed Wright Hennepin’s cooperation in installing and servicing a three-phase power-transmission line, which would, according to Ritchie’s recommendations, result in reduced levels of stray voltage. In July 2009, the Popplers completed their part of the upgrade by performing additional rewiring on the dairy farm, in accordance with Ritchie’s recommendations. Wright Hennepin agreed to install the three-phase line with the understanding that the Popplers would contribute to its cost. Wright Hennepin did not complete the installation of the three-phase line before trial.

At approximately the same time that the Popplers completed their rewiring, Wright Hennepin hired another consultant to perform electrical testing on the farm. Wright Hennepin’s consultant did not find stray voltage but told the Popplers that he also had noticed abnormal drinking behavior and that he was concerned that the neutral line serving the Popplers’ farm was too small to serve a dairy farm of the Popplers’ size.

Also in July 2009, in accordance with the recommendation of the Popplers’ consultant, Wright Hennepin agreed to install isolation transformers, which isolate the farm’s neutral line from the primary neutral line. Wright Hennepin also disconnected four grounding rods near the dairy farm, which Harlan Poppler thought were carrying too

much current from Wright Hennepin's power line. After these changes were made, the Popplers experienced an increase in milk production and an improvement in herd health.

In January 2011, however, to ensure compliance with applicable codes, Wright Hennepin re-connected three of the four grounding rods that previously had been disconnected and installed another grounding rod. Thereafter the Popplers again experienced herd health problems.

D. Procedural History

In December 2010, the Popplers commenced this action against Wright Hennepin. The Popplers' complaint alleged claims of negligence, nuisance, *res ipsa loquitur*, negligence *per se*, strict product liability, and trespass. In April 2011, Wright Hennepin moved to dismiss the Popplers' claims of negligence *per se*, strict product liability, and trespass. The district court granted the motion with respect to the first two of these claims but denied the motion with respect to the trespass claim.

In October 2011, five months before trial, Wright Hennepin moved *in limine* to exclude the Popplers' expert evidence concerning causation on the grounds that the experts were not qualified and that the testing performed by the Popplers' experts was insufficient to establish causation. Wright Hennepin also moved *in limine* to exclude the Popplers' expert evidence related to animal sensitivity to stray voltage or, in the alternative, for a *Frye-Mack* hearing to determine whether such evidence is admissible. The district court reserved ruling on the motion *in limine*; at trial, the district court overruled Wright Hennepin's objection to the same evidence.

The case was tried to a jury over two and one-half weeks in March 2012. The jury returned a special verdict form in which it found Wright Hennepin liable for negligence, trespass, and nuisance. The jury awarded the Popplers damages of \$648,200 for “Negligence and/or Trespass” and damages of \$105,000 for “Nuisance.” The district court entered judgment for the Popplers in the amount of \$753,200. The district court also issued an injunction requiring Wright Hennepin to replace the power line serving the Popplers’ dairy farm with a four-wire, three-phase line by June 30, 2012.

In April 2012, Wright Hennepin filed two post-trial motions. In its first post-trial motion, Wright Hennepin moved for judgment as a matter of law on the negligence claim on the grounds that the Popplers “failed to introduce sufficient evidence of the herd’s exposure and dose of stray electricity to levels capable of causing harm” and that the Popplers failed to introduce sufficient evidence that stray voltage was the cause of the herd’s health problems. In the alternative, Wright Hennepin moved for a new trial on the ground that the district court erred by admitting the Popplers’ expert evidence and by not holding a *Frye-Mack* hearing. The district court denied Wright Hennepin’s first post-trial motion.

In its second post-trial motion, Wright Hennepin moved to amend the jury’s verdict to find that the damages awarded consist of five specified types of damages that had been identified by the Popplers’ damages expert. In the alternative, Wright Hennepin moved for a new trial on the issue of damages to determine the amounts of damages attributable to the five specified types of damages. Wright Hennepin also moved for judgment as a matter of law or, in the alternative, for remittitur of the damages award.

The district court denied Wright Hennepin's second post-trial motion in part and granted it in part. The district court amended the jury's verdict by making amended findings to reflect the specific types of damages awarded and the amount associated with each type. The district court also remitted the Popplers' damages by \$38,000.

The Popplers filed a post-trial motion seeking an award of treble damages. The district court denied the motion.

In August 2012, the district court amended the judgment to provide for damages of \$715,200.00 plus interest in the amount of \$149,148.24 and costs and disbursements of \$54,698.69, for a total of \$919,046.93. Wright Hennepin appeals by way of a notice of appeal, and the Popplers cross-appeal by way of a notice of related appeal.

ISSUES

I. Did the district court err by denying Wright Hennepin's motion for a new trial on the ground that the Popplers' expert evidence should not have been admitted into evidence?

II. Did the district court err by denying Wright Hennepin's post-trial motion for judgment as a matter of law on the ground that the evidence of causation is insufficient?

III. Did the district court err by granting Wright Hennepin's post-trial motion to amend the jury's verdict and by "itemizing" the jury's award of damages?

IV. Did the district court err by denying Wright Hennepin's post-trial motion for judgment as a matter of law or a new trial on the ground that the Popplers' evidence of "milk loss" is insufficient to obtain damages for lost profits?

V. Did the district court err by denying the Popplers' post-trial motion for an award of treble damages?

VI. Did the district court err by submitting the Popplers' trespass claim to the jury?

ANALYSIS

I.

Wright Hennepin argues that the district court erred by denying its motion for a new trial on the ground that the Popplers' expert evidence should not have been admitted into evidence. Wright Hennepin makes two specific arguments. First, it argues that the Popplers' expert witnesses are not qualified to give expert testimony. Second, it argues that the Popplers' expert evidence is inadmissible under *Frye-Mack* or, alternatively, that the district court erred by not holding a *Frye-Mack* hearing.

To obtain a new trial on appeal based on a district court's evidentiary rulings, a party must move for a new trial. *Alpha Real Estate Co. v. Delta Dental Plan of Minn.*, 664 N.W.2d 303, 309-10 (Minn. 2003). A motion for a new trial allows the district court to "facilitate development of critical aspects of the record," to focus "on the specifics of an objection," and "to consider the context in which the alleged error occurred and the effect it might have had upon the outcome of the litigation." *Id.* at 309 (quotation omitted). A party is entitled to a new trial only if the district court erred in its evidentiary ruling and, in addition, if the error "had a reasonable likelihood of affecting the jury's verdict." *Becker v. Mayo Found.*, 737 N.W.2d 200, 218 (Minn. 2007). This court applies

an abuse-of-discretion standard of review to a district court's denial of a motion for a new trial. *Alpha Real Estate*, 664 N.W.2d at 310.

A. Expert Qualifications

Wright Hennepin argues that the Popplers' experts are not qualified to testify about stray voltage and its effects on the Popplers' dairy herd. Specifically, Wright Hennepin challenges the qualifications of veterinarian Shayne Marker, electrician Lawrence Neubauer, and nutritionist Barry Visser. This court applies an abuse-of-discretion standard of review to a district court's ruling on the admissibility of expert testimony. *City of Moorhead v. Red River Valley Coop. Power Ass'n*, 830 N.W.2d 32, 39 (Minn. 2013). Even if a district court abuses its discretion in its rulings on the admissibility of expert testimony, however, we will reverse a denial of a new trial only if the rulings resulted in prejudicial error. *Id.* at 39-40.

In its motion *in limine*, Wright Hennepin challenged the qualifications of Dr. Marker and Neubauer. Wright Hennepin argued that Dr. Marker lacked the necessary expertise "in the field of cow sensitivity to stray voltage." Wright Hennepin argued that Neubauer is not qualified because he is neither a veterinarian nor an animal physiologist and, thus, "should not be allowed to opine on the cause of herd health problems." The district court denied Wright Hennepin's motion as to Dr. Marker and reserved ruling as to Neubauer. At trial, the district court allowed Neubauer to testify.

Wright Hennepin did not challenge the qualifications of Visser in its pre-trial motion *in limine*. Rather, Wright Hennepin objected to his qualifications at trial during direct examination. Specifically, Wright Hennepin asserted that Visser is not qualified

because he lacks expertise in “electrical matters.” The Popplers responded that, although Visser is not qualified to measure electricity on the farm, he is qualified to observe the herd, to rule out nutrition-related causes, and to evaluate and interpret learned treatises identifying the level of electrical current that can affect cows. The Popplers further argued that because Visser was aware that an electrical expert had measured electric current at certain levels, Visser’s expertise in observing the herd and ruling out other causes allowed him to testify that stray voltage was causing the herd’s health problems. The district court overruled Wright Hennepin’s objection.

After trial, Wright Hennepin moved for a new trial based in part on the district court’s admission of the testimony of Dr. Marker, Neubauer and Visser. The district court denied the motion, reasoning that the Popplers are entitled to present multiple expert witnesses with expertise in various fields if they are “helpful in linking the electrical measurements in question with causation.”

Expert opinion testimony is admissible if “scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue.” Minn. R. Evid. 702. A witness may be qualified as an expert “by knowledge, skill, experience, training, or education.” *Id.* “The competency of an expert witness to provide [an expert] opinion depends upon both the degree of the witness’s scientific knowledge and the extent of the witness’s practical experience with the subject of the offered opinion.” *Gross v. Victoria Station Farms, Inc.*, 578 N.W.2d 757, 761 (Minn. 1998). Minnesota courts typically have been “liberal” in qualifying experts by virtue of their experience. *State v. Moore*, 458 N.W.2d 90, 96 (Minn. 1990).

Wright Hennepin contends that the district court erred by allowing the Popplers' experts to testify about the *cause* of the herd's health problems, as opposed to the mere *existence* of those problems. Wright Hennepin relies primarily on two supreme court cases. First, in *Kastner v. Wermerskirschen*, 295 Minn. 391, 205 N.W.2d 336 (1973), the supreme court held that the district court was within its discretion in excluding expert testimony regarding the cause and onset of a chicken disease called leukosis. *Id.* at 395, 205 N.W.2d at 339. In affirming the district court's decision, the supreme court noted that Minnesota courts typically have admitted expert testimony regarding animal health conditions under a lower standard than might be applied to expert testimony regarding human health conditions. *Id.* at 394-95, 205 N.W.2d at 338-39. The lower standard is justified by the fact that "the care of animals is generally in the hands of practical men rather than professional men." *Id.* But the supreme court nonetheless concluded that the district court was within its discretion in finding that the expert in that case was not "sufficiently qualified in the pathology of the particular chicken disease in question." *Id.* at 395, 205 N.W.2d at 339. Second, in *Gross*, the supreme court held that the district court was within its discretion in excluding expert testimony regarding the cause and onset of a condition called equine lameness. 578 N.W.2d at 762. The purported expert had extensive experience with horses but had no experience with veterinary science or diagnosing equine lameness. *Id.* at 761-62. The supreme court concluded that, despite the purported expert's experience with horses, the district court did not abuse its discretion by excluding the testimony. *Id.*

Kastner and *Gross* are distinguishable for two reasons. First, in each case, the plaintiff offered only one expert to testify about the cause of animal health problems. *Kastner*, 295 Minn. at 393, 205 N.W.2d at 338; *Gross*, 578 N.W.2d at 760. In both cases, the district court excluded that expert's testimony because the expert had no experience in diagnosing the particular disease at issue. *Kastner*, 295 Minn. at 393, 205 N.W.2d at 338; *Gross*, 578 N.W.2d at 760. The Popplers, however, offered the testimony of multiple experts, who collectively could rule out potential alternative causes of the herd's health problems in their respective areas of expertise. In addition, each expert had experience identifying possible causes of the herd's health problems, including those arising from stray voltage. Moreover, at least one court has held that expert evidence is not even necessary to prove causation in stray-voltage cases because "the nature of electricity and the results of contact with it by humans and animals is not beyond a common person's understanding." *Schlader*, 591 N.W.2d at 14.

Second, Wright Hennepin's reliance on *Kastner* and *Gross* fails to account for the deferential standard of review we apply to this type of evidentiary ruling. In both *Kastner* and *Gross*, the supreme court deferred to the district court's discretion to determine the admissibility of expert testimony. Those cases do not indicate that the district court in this case improperly exercised its discretion in deciding to admit the Popplers' expert evidence.

With these principles in mind, we turn to Wright Hennepin's specific challenges to the qualifications of the Popplers' experts.

1. *Dr. Shayne Marker*

Wright Hennepin contends that Dr. Marker is not qualified to give expert opinion testimony because he “conceded he is not an expert in electricity or stray electricity.” Dr. Marker has been a licensed veterinarian since 1997 and focuses his practice primarily on dairy cows. He works with approximately 75 dairy farms. Dr. Marker is familiar with external stressors that can affect a cow’s health and result in decreased milk production. Although Dr. Marker does not have formal training in electrical matters, he has prior experience with stray voltage and has examined literature on the subject. In light of Dr. Marker’s training and experience, the district court did not abuse its discretion by qualifying him as an expert or by denying Wright Hennepin’s motion for a new trial.

2. *Lawrence Neubauer*

Wright Hennepin contends that Neubauer is not qualified to give expert opinion testimony because he “has no training in veterinary science.” Neubauer is a master electrician licensed in Wisconsin, North Dakota, and South Dakota. He specializes in the testing of “power quality issues, which includes identification of electrical issues impacting a dairy farm, the source of any [stray voltage] . . . [,] and correction procedures necessary to remove or substantially reduce electricity affecting the dairy operation.” That Neubauer does not have training in veterinary science does not preclude him from testifying about the effect of stray voltage on the Popplers’ herd. He has experience consulting on dairy farms and has training as an electrician. Thus, the district court did not abuse its discretion by qualifying him as an expert or by denying Wright Hennepin’s motion for a new trial.

3. *Barry Visser*

Wright Hennepin contends that Visser is not qualified to give expert opinion testimony because he “disclaimed any expertise in what levels and what form of electricity are going to cause an effect on animals.” Visser is a dairy nutritionist whose educational qualifications include an associate applied science degree in dairy science and dairy production, a bachelor’s degree in animal science, and a master’s of science degree in ruminant nutrition. Before Wright Hennepin’s objection, Visser testified that he has worked with other dairy farmers to determine whether stray voltage was affecting their cows. Specifically, he testified that if he observes herd health problems, he first looks at factors that are within the control of the dairy farmer. But if he determines that the herd health problems are “unexplainable” by dairy-management concerns, he considers whether stray voltage is the problem. Visser has also read peer-reviewed journals on the subject of stray voltage. Given Visser’s training and experience, the district court did not abuse its discretion by qualifying him as an expert or by denying Wright Hennepin’s motion for a new trial.

B. *Frye-Mack Standard*

Wright Hennepin argues that the district court erred by allowing the Popplers to introduce expert evidence that was novel and scientifically unreliable or, alternatively, that the district court erred by declining to hold a *Frye-Mack* hearing.

In its pre-trial motion *in limine*, Wright Hennepin sought an order precluding the Popplers from introducing expert evidence “that use of a 200 ohm resistor is the appropriate means to calculate the impact of electrical events on dairy cows.” The

district court denied the motion. After trial, Wright Hennepin moved for a new trial, again challenging the Popplers' expert evidence that the proper measure of the resistance of a dairy cow's body is 200 ohms. The district court denied that motion as well.

To be admissible, the Popplers' expert evidence must satisfy the requirements of rule 702 of the Minnesota Rules of Evidence. *Doe v. Archdiocese of St. Paul*, 817 N.W.2d 150, 164 (Minn. 2012). Rule 702 incorporates the *Frye-Mack* standard, *id.*, which applies if the expert evidence "involves novel scientific theory," Minn. R. Evid. 702. The *Frye-Mack* standard has two prongs. First, the underlying scientific theory must be "generally accepted in the relevant scientific community." *Doe*, 817 N.W.2d at 165 (quotation omitted). Second, "the particular scientific evidence . . . must be shown to have foundational reliability." *Id.* (quotation omitted). To satisfy the second prong, the proponent of a scientific test must "establish that the test itself is reliable and that its administration in the particular instance conformed to the procedure necessary to ensure reliability." *Id.* (quotation omitted). The first prong is a question of law, which this court reviews *de novo*. *Goeb v. Tharaldson*, 615 N.W.2d 800, 815 (Minn. 2000). The second prong is a matter of discretion, which this court reviews for an abuse of discretion. *Id.*

In its motion *in limine*, Wright Hennepin relied on a publication of the Wisconsin Public Service Commission, which states that 500 ohms is a conservative estimate of the electrical resistance of a dairy cow's body. See Wis. Pub. Serv. Comm'n, *Stray Voltage & Water for Dairy Cattle* 1 (June 2003), available at <http://psc.wi.gov/utilityInfo/electric/documents/strayVoltage/cattle.pdf>. Wright Hennepin also relied on a federal government publication, commonly referred to as the "Red Book," which Wright

Hennepin claims is the definitive source of industry standards regarding stray voltage and animal sensitivity. See United States Dep't of Agric., Agric. Handbook No. 696, *Effects of Electrical Voltage/Current on Farm Animals: How to Detect & Remedy Problems* (1991). The Red Book cites a collection of research indicating that cows have an electrical resistance as low as 244 ohms. *Id.* at 3-6. Wright Hennepin contends that, in light of these authorities, Neubauer's use of 200 ohms as the electrical resistance of a dairy cow's body is not generally accepted in the relevant scientific community.

Wright Hennepin's argument fails because Neubauer's use of 200 ohms as the electrical resistance of a dairy cow's body, for purposes of this case, is not a general scientific "theory." The district court rejected Wright Hennepin's argument in its post-trial ruling by reasoning that the Popplers relied on the scientific theory of Ohm's Law, which it described as "a fundamental principle of electrical theory," to prove that stray voltage injured their dairy herd. The district court's analysis reflects an appropriate application of the first prong of the *Frye-Mack* test. See *Kaech*, 23 P.3d at 537 (holding that expert testimony in stray voltage case based on "established well-known theories of electricity, such as Ohm's law," satisfied *Frye* test). Neubauer's use of 200 ohms is not a "scientific theory"; it actually is the result of scientific tests applying scientific techniques that are based on scientific theories. Scientific tests and their results may be challenged under the second prong of the *Frye-Mack* test, but Wright Hennepin did not make such a challenge in its post-trial motion and, thus, has failed to preserve the issue for appeal. See *Alpha Real Estate*, 664 N.W.2d at 309. Because the generally accepted status of the Popplers' expert evidence is apparent from the record before the district court, there was

no need for a *Frye-Mack* hearing. See *State v. Roman Nose*, 649 N.W.2d 815, 821 (Minn. 2002); *Donnelly Bros. Constr. Co. v. State Auto Prop. & Cas. Ins. Co.*, 759 N.W.2d 651, 660 (Minn. App. 2009). Thus, the district court did not abuse its discretion by denying Wright Hennepin’s motion for a new trial on the ground that it should have excluded the Popplers’ expert evidence of a resistance value of 200 ohms.

Wright Hennepin also contends that Neubauer should not have been permitted to testify that cows can perceive electrical current at levels as low as 0.04 milliamperes and that behavioral and physiological changes occurred at levels as low as 0.25 milliamperes and 0.33 milliamperes. At trial, Neubauer testified that when cows are subjected to 0.25 milliamperes of electrical current, they “drool uncontrollably” and “snot up out of the nose.” Neubauer also testified that, at 0.33 milliamperes, a dairy cow will “lock . . . up tight as a drum.” Wright Hennepin objected to this testimony on the ground that Neubauer is not qualified to make such statements, but Wright Hennepin did not object on the ground that the testimony is inadmissible under either prong of the *Frye-Mack* standard. Thus, this argument also has not been preserved for appeal. See *Becker Cnty. Nat. Bank v. Davis*, 204 Minn. 603, 284 N.W. 789 (1939); *State v. Rodriguez*, 505 N.W.2d 373, 376 (Minn. App. 1993).

In sum, we conclude that the district court did not abuse its discretion by denying Wright Hennepin’s motion for a new trial on the ground that the Popplers’ expert evidence should not have been admitted at trial.

II.

Wright Hennepin argues that the district court erred by denying its motion for judgment as a matter of law on the ground that the evidence of causation is insufficient. Wright Hennepin does not deny that the Popplers' dairy herd was exposed to stray voltage. Rather, Wright Hennepin argues that the stray voltage was at such low levels that it could not cause the Popplers' dairy cows to experience health problems or to produce less milk.

A district court may grant a party's motion for judgment as a matter of law if "there is no legally sufficient evidentiary basis for a reasonable jury to find for that party on that issue." Minn. R. Civ. P. 50.01. We apply a *de novo* standard of review to the district court's decision to deny a motion for judgment as a matter of law. *In re Estate of Butler*, 803 N.W.2d 393, 399 (Minn. 2011). In assessing whether there is sufficient evidence to support a jury verdict, we review the evidence in the light most favorable to the verdict. *Kidwell v. Sybaritic, Inc.*, 784 N.W.2d 220, 229 (Minn. 2010).

At trial, the Popplers presented the testimony of numerous witnesses on the causation issue, including Harlan Poppler, Roy Marschall, Barry Visser, Dr. Shayne Marker, Donald Johnson, and Lawrence Neubauer. Harlan Poppler testified that he did not make significant changes in his management and care of the herd before and after the herd problems began. He also testified that he considered a variety of potential alternative causes but ruled out all of them. Because he ruled out alternative causes, he focused on stray voltage as a potential cause. Similarly, Roy Marschall testified that the

controllable factors on the farm, such as management, housing, and nutrition, did not cause the herd's health problems.

Visser, the Popplers' nutritionist, testified that he observed avoidance behavior, specifically that the cows exhibited abnormal drinking behavior and unusual behavior in the milking parlor. Visser also testified that the herd's nutrition did not cause health problems and that the herd's rations did not cause the decrease in milk production.

Dr. Marker, the Popplers' veterinarian, testified to similar observations of the herd's behavior. He also testified that he examined various potential alternative causes of the herd's health and milk-production problems. He testified that herd health improved only after Wright Hennepin installed an isolation transformer, which was expected to help alleviate stray-voltage problems. Dr. Marker testified that the herd's health problems began again after January 2011, when Wright Hennepin re-connected the grounding rods near the Popplers' farm. Dr. Marker testified that stray voltage caused the herd's health problems.

Donald Johnson, an expert electrical engineer, testified that a number of Wright Hennepin's practices with regard to supplying electricity to the Popplers' farm violated industry standards and resulted in the presence of stray voltage on the farm. Specifically, he testified that Wright Hennepin failed to properly maintain the voltage regulator at the Popplers' farm in violation of industry standards. He also testified that the voltage regulator was defective and contributed to an increase in the likelihood of stray voltage. Johnson further testified that the transformers at the Poppler farm were undersized, which may exacerbate stray voltage.

Lawrence Neubauer, an expert electrician, testified that he tested the electrical current at the Popplers' farm and that his testing revealed current levels high enough to have an effect on the Popplers' herd. Neubauer also testified that the voltage level at the Popplers' farm was lower than industry standards and that the reason for the voltage drop was that the line was "unreasonably old." He also testified that the resistance of the neutral line serving the Popplers' farm was approximately six times higher than the industry standard and that high resistance can result in stray voltage. Neubauer tested the return current on the neutral wire and found that it was well below the industry standard, which means that, rather than flowing back through the neutral line, electricity was flowing "[i]nto the one place it can go, into the earth." Neubauer also testified that he measured the stray voltage at the Popplers' farm and concluded that it was high enough to have an effect on the Popplers' cows.

In challenging the Popplers' evidence of causation, Wright Hennepin cites *Goeb*, in which the supreme court stated that "[o]ne of the central tenets of toxicology is that 'the dose makes the poison.'" 615 N.W.2d at 815 (quoting Federal Judicial Ctr., *Moore's Federal Practice, Reference Manual on Scientific Evidence* 185 (1995)). Nonetheless, Wright Hennepin's appellate arguments are not specific as to the particular amount of electrical current to which the Popplers' dairy cows were exposed and the minimum level that might cause them injury. Wright Hennepin simply iterates and reiterates that the Popplers' evidence of causation is insufficient, without attempting to quantify or helpfully describe the Popplers' evidence.

In response, the Popplers highlight evidence that, in 2010, Neubauer measured electrical currents at the dairy farm and obtained readings showing that a dairy cow would experience between 1.02 and 2.15 milliamperes of current. Neubauer testified that these levels of electrical current are high enough to cause the herd's abnormal drinking behavior. In reply, Wright Hennepin critiques the Popplers' evidence on various grounds, such as that the readings are too few and too infrequent and that the frequency and duration of high electrical currents are unknown. But Wright Hennepin does not effectively refute the basic fact that the Popplers' evidence tends to prove that the dairy herd was exposed to stray voltage in amounts that are harmful. Given the evidence in the record, a jury reasonably could infer that the Popplers' dairy cows experienced electrical current at levels that were similar to Neubauer's measurements and that the electrical current caused health problems that resulted in financial injuries. *See Northern Petrochemical Co. v. U.S. Fire Ins. Co.*, 277 N.W.2d 408, 410-11 (Minn. 1979) (explaining that jury may make reasonable inferences from evidence presented). Wright Hennepin has failed to convince us that the Popplers' evidence is insufficient to establish causation.

Wright Hennepin also argues that the Popplers' evidence is insufficient to prove that the dairy herd was exposed to stray voltage throughout the entire damages period of 2006 to 2011. Scientific testing throughout the six-year period is not necessary to establish that the Popplers' sustained damages during that time frame. *See Sentinel Mgmt. Co. v. Aetna Cas. & Sur. Co.*, 615 N.W.2d 819, 827-28 (Minn. 2000). The Popplers presented evidence that the herd began experiencing health problems in 2006

and that, from 2006 until trial, the herd was not producing milk at the usual rate. Because the evidence is sufficient to prove that the Popplers' dairy herd was exposed to stray voltage at the relevant time periods, a jury reasonably could infer that stray voltage was the cause of decreased milk production throughout the six-year damages period. *See id.* The jury is entitled to make reasonable inferences, and we review the jury's inferences in the light most favorable to the verdict. *Northern Petrochemical*, 277 N.W.2d at 410.

Based on all the evidence presented at trial, a reasonable jury could find that stray voltage caused injury to the Popplers' dairy cows and, thus, to the Popplers. Therefore, the district court did not err by denying Wright Hennepin's motion for judgment as a matter of law on the sufficiency of the evidence of causation.

III.

The Popplers argue that the district court erred by granting Wright Hennepin's motion to amend the jury's verdict by providing an "itemization" of the jury's damages awards. The Popplers contend that the district court erred because it had no legal authority to "itemize" the jury's damages awards or to make amended findings on the issue of damages.

At the instructions conference, the district court proposed a special verdict form that would have required the jury to determine damages, if necessary, by providing a single number that reflected the total damages award. Wright Hennepin objected to the district court's proposal. Wright Hennepin's alternative would have required the jury to determine damages, if necessary, by providing five different amounts of damages, one for each type of damages that the Popplers' damages expert, Dr. Michael Behr, had identified

in his pre-trial expert report and in his trial testimony. Wright Hennepin attempted to justify its proposal by arguing that its special verdict form would allow Wright Hennepin to more easily challenge the Popplers' evidence of damages in a post-trial motion and on appeal. The district court rejected Wright Hennepin's proposal but submitted a special verdict form that asked the jury to make two awards of damages: one for "Negligence and/or Trespass" and one for "Nuisance." The jury awarded \$648,200 in damages for "Negligence and/or Trespass" and \$105,000 in damages for "Nuisance," for a total of \$753,200.

In a post-trial motion, Wright Hennepin moved for a new trial to determine the breakdown of the jury's damages awards or, in the alternative, for amended findings by the district court that would itemize the damages awarded by the jury according to the categories of damages identified by Dr. Behr. The district court granted the motion and proceeded to itemize the jury's damages awards by breaking them down into the following categories and amounts:

Milk Loss	\$697,155
Young Stock Loss	\$1,924
Cull Cow Loss	\$6,614
Cost Saving	(\$163,288)
Excess Costs	\$105,000
Capital Loss	\$105,795
Total Award	\$753,200

As authority for its "itemization" of the jury's damages awards, the district court relied on the following rule of civil procedure:

If . . . the court omits any issue of fact raised by the pleadings or by the evidence, each party waives the right to a trial by jury of the issue so omitted unless before the jury retires the

party demands its submission to the jury. As to an issue omitted without such demand, the court may make a finding; or, if it fails to do so, it shall be deemed to have made a finding in accord with the judgment on the special verdict.

Minn. R. Civ. P. 49.01(a).

In its responsive argument, Wright Hennepin contends that the issue on which the district court made findings was “omitted” because the district court did not adopt jury instructions and a special verdict form that would have required the jury to determine the amount of each component of the Popplers’ damages. The district court relied on *Hill v. Okay Constr. Co.*, 312 Minn. 324, 252 N.W.2d 107 (1977), in which the supreme court held that, under rule 49.01, a district court has authority “to make such additional findings supplementing a special verdict as are necessary to render a judgment.” *Id.* at 344, 252 N.W.2d at 120. The district court in *Hill* used a special verdict form, and the jury answered questions related to liability but did *not* answer questions related to damages, for reasons that are not explained in the opinion. *Id.* at 348-49, 252 N.W.2d at 122. Because the jury had determined that the defendants were liable, the district court made findings on the amount and apportionment of damages. *Id.* at 351-52, 252 N.W.2d at 123-24. The supreme court affirmed, noting that the district court had authority to make such findings because they “merely add[ed] necessary, consistent details to the findings of the jury and [were] amply supported by the evidence.” *Id.* at 344, 252 N.W.2d at 120. In this case, however, the jury determined issues of liability and damages. Thus, the issue of damages was not “omitted” from the jury’s verdict, and the district court was able to enter judgment in the amount of \$753,200 without any need for

additional findings. For these reasons, neither rule 49.01 nor *Hill* provide authority for the district court's additional fact-finding.

Wright Hennepin also contends that the district court's itemization of damages is justified by rule 52.01. But rule 52 applies only in "actions tried upon the facts without a jury or with an advisory jury." Minn. R. Civ. P. 52.01. The rule does not apply to this case and, thus, does not provide a legal basis for the district court's itemization of the jury's damages awards.

Wright Hennepin has not cited any other authority as a legal basis for the district court's amended findings. We have thoroughly researched Minnesota law and federal law and are not aware of any such authority. Thus, we conclude that the district court erred by making amended findings that "itemized" the jury's damages awards. Consequently, we will review the jury's verdict, not the district court's amended findings, when analyzing the parties' other arguments related to damages.

IV.

Wright Hennepin argues that the district court erred by denying its motion for judgment as a matter of law or a new trial on the ground that the evidence of damages is insufficient. Specifically, Wright Hennepin argues that the Popplers failed to prove lost profits and that their request for damages based on "milk loss" is improper because it does not account for any decreased costs that may be associated with decreased milk production.

At trial, the Popplers summarized their evidence of damages by introducing the expert testimony and expert report of Dr. Michael Behr. Dr. Behr's report identified five

types of compensatory damages: (1) milk loss, (2) young-stock loss (*i.e.*, lost revenues from sales of dairy cows to other dairy farms due to reduced herd size), (3) cull-cow loss (*i.e.*, lost revenues from sales of cows for beef due to reduced herd size), (4) excess costs (*i.e.*, the Popplers' share of the cost of installation of a new three-phase power line), and (5) capital loss (*i.e.*, decrease in valuation of dairy herd). Dr. Behr deducted \$163,288 in offsetting cost savings that are attributable to the deaths of some dairy cows and the resulting decrease in the size of the Popplers' dairy herd. In his report, Dr. Behr accounted for total damages of \$753,200 from January 1, 2006, to September 30, 2011. At trial, Dr. Behr testified that damages from the date of his report until the date of trial were an additional \$70,000 to \$80,000. The Popplers also introduced evidence of additional damages. They introduced evidence of \$81,708 in expenses related to rewiring the dairy farm. They also introduced evidence that they paid \$7,222 to their stray-voltage consultant, John Ritchie. In total, the evidence conceivably could have supported an award of \$922,130 in damages. In closing argument, the Popplers' counsel asked the jury to award total damages of \$917,130. The Popplers' evidence of damages specifically related to "milk loss" (by which they mean simply a decrease in revenues from the sale of milk) amounted to \$697,155.

As a general rule, the plaintiff has the burden of proving compensatory damages. *Canada by Landy v. McCarthy*, 567 N.W.2d 496, 507 (Minn. 1997). Compensatory damages are synonymous with actual damages. *Phelps v. Commonwealth Land Title Ins. Co.*, 537 N.W.2d 271, 275 (Minn. 1995). The term "actual damages" means "[a]n amount awarded to a complainant to compensate for a proven injury or loss; damages that

repay actual losses.”” *Ray v. Miller Meester Adver., Inc.*, 684 N.W.2d 404, 407 (Minn. 2004) (quoting *Black’s Law Dictionary* 394 (7th ed. 1999)) (alteration in original). Damages in a business context generally are in the form of lost profits. *See, e.g., Hydra-Mac, Inc. v. Onan Corp.*, 450 N.W.2d 913, 920 (Minn. 1990); *Cardinal Consulting Co. v. Circo Resorts, Inc.*, 297 N.W.2d 260, 266 (Minn. 1980); *Northern Petrochemical Co. v. Thorsen & Thorshov, Inc.*, 297 Minn. 118, 125, 211 N.W.2d 159, 166 (1973). A plaintiff has the burden of proving the existence of lost profits “to a reasonable certainty” and the amount of those damages “to a reasonable probability.” *Hydra-Mac*, 450 N.W.2d at 920. A plaintiff may not recover damages that are “speculative, remote, or conjectural.” *Cardinal Consulting*, 297 N.W.2d at 267. But “[t]he law does not require mathematical precision in proving lost profits.” *Hydra-Mac*, 450 N.W.2d at 921. “Once the fact of loss has been shown, the difficulty of proving its amount will not preclude recovery so long as there is proof of a reasonable basis upon which to approximate the amount.” *Leoni v. Bemis Co.*, 255 N.W.2d 824, 826 (Minn. 1977).

Through the testimony of Dr. Behr and others, the Popplers introduced evidence that decreased milk production caused a decrease in revenues. Dr. Behr calculated “milk loss” by comparing the Popplers’ actual milk sales to their “normal” milk sales. For the “normal” scenario, Dr. Behr assumed, for the years 2009, 2010, and 2011, for example, that the Popplers would have had a full herd of 200 dairy cows, with each cow producing 34,000 pounds of milk. The Popplers actually had average herd sizes of 190, 175, and 196, respectively, in those years, with average milk production of 30,436 pounds, 30,447 pounds, and 29,112 pounds, respectively. In his expert report, Dr. Behr stated that his

damages analysis was “not concerned” with profits. Likewise, Dr. Behr testified at trial that his estimate of losses was a gross figure and did not represent a measurement of lost profits. The Popplers did not introduce any evidence as to whether the decrease in milk production led to a corresponding decrease in expenses with respect to the dairy cows that did not perish.

Although difficulty in proving the amount of lost profits does not preclude recovery, we must have some “reasonable basis upon which to approximate” the amount of lost profits. *See id.* The Popplers provided only one component of the lost-profits equation by introducing evidence that the decrease in milk production caused a decrease in revenues. But they did not provide the other component by introducing any evidence as to whether their expenses also decreased and, if so, by how much. Without at least an approximation of the latter component, the existence of lost profits cannot be established with “reasonable certainty,” and the amount of lost profits cannot be established with “reasonable probability.” *See Hydra-Mac*, 450 N.W.2d at 920.

The weakness of the Popplers’ evidence is illustrated by the caselaw. For example, in *Lanesboro Produce & Hatchery Co. v. Forthun*, 218 Minn. 377, 16 N.W.2d 326 (1944), the supreme court held that the plaintiff’s evidence of lost profits from an egg hatchery was sufficient because the plaintiff introduced evidence of average production rates and the price of eggs sold as well as the expenses of producing eggs. *Id.* at 381, 16 N.W.2d at 328; *see also Hydra-Mac*, 450 N.W.2d at 921 (affirming lost-profits award based on evidence of lost sales and cost of lost sales). On the other hand, in *Faust v. Parrott*, 270 N.W.2d 117 (Minn. 1978), the supreme court held that the plaintiffs failed to

prove lost profits by introducing evidence of lost sales but failing to introduce evidence of the “actual profit” they would have received. *Id.* at 121. Likewise, in *Deutz & Crow Co. v. Anderson*, 354 N.W.2d 482 (Minn. App. 1984), this court held that the plaintiff failed to prove lost profits on a breach-of-contract claim by introducing evidence of gross sales, without any evidence concerning a change in production expenses. *Id.* at 488.

The Popplers do not contend that their evidence satisfies the general principles concerning damages for lost profits. Rather, they appear to argue that “milk loss” is a recognized measure of damages, independent of lost profits. But they do not cite any binding precedent squarely holding that “milk loss,” by itself, is an appropriate measure of damages. They cite *ZumBerge v. Northern States Power Co.*, 481 N.W.2d 103 (Minn. App. 1992), *review denied* (Minn. Apr. 29, 1992), which refers to “financial losses as a result of decreased milk production.” *Id.* at 110. But the defendant did not challenge the plaintiff’s method of proving damages. *Id.* Thus, the *ZumBerge* opinion does not support the proposition that a plaintiff can recover damages for “milk loss” without regard for any change in the amount of the plaintiff’s expenses.

In the case that is most closely on point, a federal circuit court of appeals rejected an argument that is practically identical to the Popplers’ argument. In *Racicky v. Farmland Indus., Inc.*, 328 F.3d 389 (8th Cir. 2003), the plaintiffs were dairy farmers who sought to prove that feed provided by the defendants injured their dairy herd, causing decreased milk production. *Id.* at 392-93. A jury returned a verdict in the plaintiffs’ favor and awarded damages of approximately \$700,000. *Id.* at 392. The United States Court of Appeals for the Eighth Circuit, applying Nebraska law, reversed

the award of damages on the ground that the evidence did not establish the plaintiffs' lost profits. *Id.* at 389-99. The court described the plaintiffs' theory as "lost milk production equals lost profits" but rejected it on the ground that the plaintiffs were required to introduce evidence of a change in their expenses, which, in conjunction with evidence of a change in their revenues, would allow a calculation of lost profits. *Id.*

In sum, to recover damages that would make them whole, the Popplers needed to introduce evidence of the existence and amount of their decrease in revenues as well as the existence or non-existence and amount of any offsetting decrease in their expenses. The Popplers' "milk loss" theory is incompatible with the Minnesota caselaw on lost profits and, thus, is not a proper measure of damages.

Because the Popplers' evidence is insufficient to support the jury's damages awards, the district court erred by denying Wright Hennepin's post-trial motion for judgment as a matter of law or a new trial. The district court's error requires this court to determine the proper appellate remedy. The issue is governed by the following rule of civil procedure:

If the motion for judgment as a matter of law is denied, the party who prevailed on that motion may, as respondent on appeal, assert grounds entitling the party to a new trial in the event the appellate court concludes that the trial court erred in denying the motion for judgment. If the appellate court reverses the judgment, nothing in this rule precludes it from determining that the respondent is entitled to a new trial, or from directing the trial court to determine whether a new trial shall be granted.

Minn. R. Civ. P. 50.04. Even if a respondent does not request a new trial on appeal in a case in which a jury verdict is set aside for insufficient evidence, it is "incumbent" on an

appellate court to consider whether a new trial is necessary. *Neely v. Martin K. Eby Constr. Co.*, 386 U.S. 317, 327-31, 87 S. Ct. 1072, 1079-81 (1967).¹

If a plaintiff seeks multiple types of damages and a jury returns a verdict with multiple damages awards that correspond to the plaintiff's requests, an appellate court may reverse in part by simply striking the award or awards that are insufficient as a matter of law. *See, e.g., Longbehn v. Schoenrock*, 727 N.W.2d 153, 159-62 (Minn. App. 2007). But the matter is not so simple if a jury makes an award of damages that may be based either on evidence that is legally valid or on evidence that is legally invalid or on both types of evidence. Generally, a new trial is necessary if one of multiple issues is erroneously submitted to the jury and it is impossible to know whether the jury's verdict "was based upon an issue which was properly submitted or upon an issue which was improperly submitted." *Schroht v. Voll*, 245 Minn. 114, 118, 71 N.W.2d 843, 846 (1955). Thus, if a jury awards a "lump sum" that includes both valid and invalid types of damages, a new trial "is the only viable option." *Morrison Knudsen Corp. v. Fireman's Fund Ins. Co.*, 175 F.3d 1221, 1254-55 (10th Cir. 1999) (remanding for new trial because three of plaintiff's five types of damages were invalid but jury made one award of damages). This is particularly true if the jury's verdict obviously includes an invalid form of damages because the evidence of the valid form of damages is less than the total amount awarded. *See Bone v. Refco, Inc.*, 774 F.2d 235, 242-43 (8th Cir. 1985)

¹Minnesota's rule 50.04 is modeled after federal rule 50(d). At the time of the *Neely* opinion, the language of the federal rule was substantially the same as the current version of the Minnesota rule. *See* Minn. R. Civ. P. 50.04; Minn. R. Civ. P. 50.04, 2006 advisory comm. cmt.; *Neely*, 386 U.S. at 323-24, 87 S. Ct. at 1077.

(remanding for new trial because one of plaintiff's three types of damages was invalid but jury made one award of damages).

In this case, the jury made two awards of damages, one for "Negligence and/or Trespass" and one for "Nuisance." It is impossible to know the extent to which the jury's awards of damages are based on the Popplers' invalid "milk loss" theory. *See Schroht*, 245 Minn. at 118, 71 N.W.2d at 846. Thus, a new trial is necessary to determine the amount of damages. *See Advanced Training Sys. Inc. v. Caswell Equip. Co.*, 352 N.W.2d 1, 7-8 (Minn. 1984) (remanding for new trial because one of plaintiff's two types of damages was invalid but jury made one award of damages); *Morrison Knudsen*, 175 F.3d at 1254-55; *Bone*, 774 F.2d at 242-43. The scope of the new trial is limited to the issue of damages. *See Advanced Training Sys.*, 352 N.W.2d at 8.

Because we are remanding for a new trial on damages, we need not consider and resolve the parties' respective arguments concerning Wright Hennepin's motion for remittitur.

V.

The Popplers argue that the district court erred by denying their post-trial motion for treble damages. Their argument presents an issue of statutory interpretation, which this court reviews *de novo*. *Swenson v. Nickaboine*, 793 N.W.2d 738, 741 (Minn. 2011).

The statute on which the Popplers rely provides for treble damages in certain situations:

Whoever shall carry away, use or destroy any wood, timber, lumber, hay, grass, or other personal property of another person, without lawful authority, shall be liable to the

owner thereof for treble the amount of damages assessed therefor in an action to recover such damages.

Minn. Stat. § 548.05 (2012). The Popplers contend that the phrase “other personal property” in this statute includes dairy cows. The supreme court, however, has concluded that the phrase “other personal property” is “limited to ‘products of the soil’ or things ‘produced by and grown upon land.’” *Mondt v. Sexter Realty Co.*, 293 N.W.2d 376, 377 (Minn. 1980) (quoting *Berg v. Baldwin*, 31 Minn. 541, 18 N.W. 821 (1884)).

The Popplers nonetheless contend that their dairy cows are products of the soil because they eat products of the soil and “are produced and grown upon the land.” But the supreme court concluded long ago that the statute does not apply to grazing animals. In *Berg*, the supreme court considered whether the defendants were liable for treble damages for wrongfully taking two oxen from the plaintiffs’ property. 31 Minn. at 542, 18 N.W. at 822. The supreme court explained that the treble-damages statute should be strictly construed so as not to apply to the oxen because they were not produced and did not grow on the land. *Id.* at 542-43, 18 N.W. at 822. Approximately a century later, the supreme court reaffirmed its reasoning in *Berg. Mondt*, 293 N.W.2d at 377. There is no meaningful difference between the oxen in *Berg* and the dairy cows in this case. Thus, the district court did not err by denying the Popplers’ motion for an award of treble damages under section 548.05.

VI.

Wright Hennepin argues that the district court erred by submitting the Popplers’ trespass claim to the jury. The Popplers respond first by arguing that Wright Hennepin

failed to preserve a challenge to the submission of the trespass claim. The Popplers also respond that trespass is a viable cause of action in this type of case.

A. Preservation

The procedures for determining the content of jury instructions are thoroughly described in rule 51 of the Minnesota Rules of Civil Procedure. Each party may make requests for instructions, preferably before the close of the evidence. *See* Minn. R. Civ. P. 51.01. Before instructing the jury and before closing arguments, a district court must inform the parties of its proposed jury instructions and give them an opportunity to object to the court's proposed instructions. Minn. R. Civ. P. 51.02(a), (b). "A party who objects to an instruction or the failure to give an instruction must do so on the record, stating distinctly the matter objected to and the grounds of the objection." Minn. R. Civ. P. 51.03(a). A party preserves an objection for appeal by asserting a proper objection pursuant to rule 51.03. Minn. R. Civ. P. 51.04(a). If a party fails to assert a proper objection to a jury instruction, this court nonetheless may review the instruction on appeal for plain error. Minn. R. Civ. P. 51.04(b).

In this case, Wright Hennepin failed to object, on the record, to the trespass instruction at the instructions conference. When the district court asked Wright Hennepin's counsel whether they wished to object to any of the district court's proposed jury instructions, Wright Hennepin asserted only one objection, to an instruction concerning damages. Thus, Wright Hennepin did not object in the manner required by rule 51.03.

Wright Hennepin does not dispute that it failed to object to the trespass instruction at the instructions conference pursuant to rule 51.03. Rather, Wright Hennepin contends that it “persistently and vigorously opposed submission of the trespass claim” by bringing a pre-trial motion to dismiss under rule 12, by requesting jury instructions that omitted a trespass instruction, and by bringing a post-trial motion for judgment as a matter of law under rule 50. Wright Hennepin relies on *Stelter v. Chiquita Processed Foods, L.L.C.*, 658 N.W.2d 242 (Minn. App. 2003), in which this court stated, “A litigant preserves for review on appeal the district court’s alleged error in failing to give a requested jury instruction if the error is the subject of a motion for judgment notwithstanding the verdict.” *Id.* at 246 (citing *Hubenette v. Ostby*, 213 Minn. 349, 349-53, 6 N.W.2d 637, 638-39 (1942)). The *Stelter* opinion, however, was issued before the 2006 amendment to rule 51, which was modeled after the 2003 amendments to the equivalent federal rule. *See* Minn. R. Civ. P. 51.04, 2003 advisory comm. cmt. The 2006 amendment to rule 51 reinforced the obligation to make a clear objection on the record at the instructions conference and the consequences of not making such an objection. *See* Minn. R. Civ. P. 51.03(a). Furthermore, the *Stelter* opinion is based on a 1942 supreme court opinion that pre-dates the adoption of the rules of civil procedure. *See Hubenette*, 213 Minn. at 349-53, 6 N.W.2d at 638-39. The *Stelter* opinion no longer reflects the applicable law concerning objections to proposed jury instructions. *See Niemi v. Girl Scouts of Minn. & Wis. Lakes & Pines*, 768 N.W.2d 385, 388 (Minn. App. 2009) (noting that amendment to rule of court may supersede prior caselaw).

Since the 2006 amendment, the supreme court has applied the plain-error test of rule 51.04(b) to a civil case in which a party sought a new trial based on an allegedly erroneous instruction to which it did not object. *See Frazier v. Burlington Northern Santa Fe Corp.*, 811 N.W.2d 618, 626 (Minn. 2012). Because Wright Hennepin failed to object on the record to the trespass instruction, we may review Wright Hennepin’s arguments concerning the trespass instruction only for plain error. *See* Minn. R. Civ. P. 51.04(b); *Frazier*, 811 N.W.2d at 626.

B. Plain-Error Test

The plain-error rule provides, “A court may consider a plain error in the instructions affecting substantial rights that has not been preserved as required by Rule 51.04(a)(1) or (2).” Minn. R. Civ. P. 51.04(b).

The plain-error test that applies in civil cases appears to be the same as the plain-error test that applies in criminal cases. *See Frazier*, 811 N.W.2d at 626 (citing *State v. Griller*, 583 N.W.2d 736 (Minn. 1998)). Under the plain-error test, an appellate court reviews an assertion of error to determine (1) whether there is an error, (2) whether the error is plain, and (3) whether the error affects a party’s substantial rights. *Id.* (citing *Griller*, 583 N.W.2d at 740). If the first three requirements of the plain-error test are satisfied, an appellate court must consider a fourth requirement, whether correction of the error is necessary “to ensure fairness and the integrity of the judicial proceedings.” *Id.* at 626-27 (citing *Griller*, 583 N.W.2d at 740); *see also State v. Kuhlmann*, 806 N.W.2d 844, 852-53 (Minn. 2011).

The federal rules advisory committee noted that, although the criminal and civil plain-error tests use the same language, “the context of civil litigation often differs from the context of criminal prosecution” and that “actual application of the plain-error standard takes account for the differences.” Fed. R. Civ. P. 51, 2003 advisory comm. note. This comment is consistent with an opinion in which the United States Supreme Court stated that the plain-error test is primarily intended for criminal cases. *United States v. Atkinson*, 297 U.S. 157, 160, 56 S. Ct. 391, 392 (1936). The United States Court of Appeals for the Eighth Circuit has explained that the plain-error test “is a stringently limited standard of review, *especially in the civil context*, and must result in a miscarriage of justice in order to compel reversal.” *Lopez v. Tyson Foods, Inc.*, 690 F.3d 869, 876 (8th Cir. 2012) (emphasis added) (quotation omitted).

1. Error

We first consider whether the trespass instruction was erroneous. Wright Hennepin contends that the existence of stray voltage on the Popplers’ property does not give rise to a viable cause of action for trespass. The Minnesota appellate courts have not had the opportunity to address this question. *See, e.g., Siewert*, 793 N.W.2d at 276 n.1 (noting pre-trial dismissal of trespass claim in stray-voltage case). Wright Hennepin’s argument presents a question of law, which we review *de novo*. *Anderson v. Minnesota Ins. Guar. Ass’n*, 534 N.W.2d 706, 709 (Minn. 1995).

A defendant may be held liable for trespass if the “plaintiff has the ‘right of possession’ to the land at issue and there is a ‘wrongful and unlawful entry upon such possession by defendant.’” *Johnson v. Paynesville Farmers Union Coop. Oil Co.*, 817

N.W.2d 693, 701 (Minn. 2012) (quoting *All American Foods, Inc. v. County of Aitkin*, 266 N.W.2d 704, 705 (Minn. 1978)). The defendant’s entry “must be done by means of some physical, tangible agency,” which could be either “a person or [a] tangible object.” *Id.* (quotation omitted). “The gist of the tort of trespass . . . is the intentional interference with rights of exclusive possession.” *Id.* (quotation omitted).

When people or tangible objects enter the plaintiff’s land without permission, these entries disturb the landowner’s right to exclusively possess her land. But the disruption to the landowner’s exclusive possessory interest is not the same when the invasion is committed by an intangible agency Such invasions may interfere with the landowner’s use and enjoyment of her land, but those invasions do not require that the landowner share possession of her land in the way that invasions by physical objects do.

Id. at 702 (citations omitted).

In *Johnson*, the supreme court considered whether a trespass occurred when a fine, invisible pesticide mist drifted from the defendant’s farm to the plaintiff’s neighboring organic farm. *Id.* at 700-01. The supreme court decided the case primarily based on the distinction between trespass and nuisance. The supreme court noted that, traditionally, “[t]he law of nuisance deals with indirect or intangible interference with an owner’s use and enjoyment of land, while trespass deals with direct and tangible interferences with the right to exclusive possession of land.” *Id.* at 704 (quoting Dan B. Dobbs, *The Law of Torts* § 50, at 96 (2000)). The supreme court referred to the pesticide mist as “particulate matter,” which it deemed to be “intangible.” *Id.* at 702. Consistent with that characterization, the supreme court reasoned that the pesticide mist interfered with the plaintiff’s use and enjoyment of his organic farm but not with his right to exclusive

possession of his farmland. *Id.* at 704. Thus, the supreme court concluded that the plaintiff could not maintain a claim of trespass. *Id.* at 705.

Wright Hennepin contends that electricity is analogous to a fine, invisible pesticide mist because electricity is intangible. Likewise, *amicus curiae* Northern States Power Company contends that electricity is intangible such that stray voltage does not give rise to a cause of action for trespass. In response, the Popplers attempt to distinguish *Johnson* by asserting that electricity is tangible, rather than intangible. It appears, however, that electrical current is at least as intangible as a fine pesticide mist, if not more intangible. A liquid pesticide, even if finely dispersed as an invisible mist, nonetheless consists of discernible matter whose particles have some volume and mass. Electrical current, on the other hand, does not have any volume or mass but, rather, is merely an electrical charge to the matter that conducts the charge. *See, e.g.*, Howard Marks, *Electromagnetic Forces From Overhead High-Voltage Transmission of Electricity: Establishing Causation Using Toxicological & Epidemiological Evidence Under a Post-Daubert Standard*, 13 J. Env'tl. L. & Litig. 163, 165 (1998). Furthermore, the existence of stray voltage in this case interfered with the Popplers' use and enjoyment of their dairy farm, but there is no evidence that it interfered with their right to exclusive possession of the farm. Thus, the existence of stray voltage on the Popplers' farm cannot give rise to a cause of action for trespass, and the district court erred by submitting the trespass claim to the jury. Accordingly, the first requirement of the plain-error test is satisfied.

2. *Plain Error*

We next consider whether the district court's error was plain. See *Frazier*, 811 N.W.2d at 626. An error is plain if it is clear or obvious, *State v. Strommen*, 648 N.W.2d 681, 688 (Minn. 2002), and an error is clear or obvious if it "contravenes case law, a rule, or a standard of conduct," *State v. Ramey*, 721 N.W.2d 294, 302 (Minn. 2006).

In applying the second requirement of the plain-error test, it is necessary to determine whether we should evaluate the district court's jury instruction with reference to the caselaw as it existed at the time of trial or the caselaw as it exists today. The distinction is significant in this case because, at the time of trial, the supreme court had not yet issued its opinion in *Johnson*. At that time, the binding precedent was this court's opinion in the same case, in which we held that a fine pesticide mist *may* give rise to a viable claim of trespass. *Johnson v. Paynesville Farmers Union Coop. Oil Co.*, 802 N.W.2d 383, 389 (Minn. App. 2011), *rev'd*, 817 N.W.2d 693 (Minn. 2012). In fact, the district court cited this court's opinion in *Johnson* in its order denying Wright Hennepin's pre-trial rule 12 motion to dismiss the trespass claim.

This court recently held that in analyzing the second requirement of the plain-error test in a criminal case, we should refer to the caselaw as it exists at the time of appellate review. *State v. Kelley*, ___ N.W.2d. ___, 2013 WL 3284225 at *9 (Minn. App. July 1, 2013). Adopting that approach in this case, we must conclude that the district court's error is plain. It is clear and obvious that if the entry of a pesticide mist onto a neighboring property does not give rise to a cause of action for trespass, the existence of stray voltage also does not. It is clear and obvious that stray voltage is intangible, as that

word is used in this context, and that stray voltage does not interfere with a landowner's right to exclusive possession. Thus, the district court's error in submitting the trespass claim to the jury is plain. Accordingly, the second requirement of the plain-error test is satisfied.²

3. *Substantial Rights*

We next consider whether the district court's plain error affected Wright Hennepin's substantial rights. See Minn. R. Civ. P. 51.04(b); *Frazier*, 811 N.W.2d at 626. “[A]n error affects substantial rights where there is a reasonable likelihood that the absence of the error would have had a significant effect on the jury’s verdict.” *State v. Reed*, 737 N.W.2d 572, 583 (Minn. 2007) (quotation omitted). Wright Hennepin bears the burden of persuasion to establish that the district court's plain error affected its substantial rights. *Id.* at 583-84 & n.4.

The first interrogatory on the special verdict form asked whether Wright Hennepin was negligent in failing to maintain or operate the electrical-distribution system that provided electricity to the Popplers' dairy farm. The fifth interrogatory asked whether Wright Hennepin created a nuisance that caused harm to the Popplers' dairy farm. And the seventh interrogatory, which was captioned “Trespass,” asked whether Wright Hennepin unlawfully caused electricity to enter the Popplers' dairy farm and interfere

²If we were required to evaluate the district court's jury instruction with reference to the caselaw as it existed at the time of trial, we would conclude that the second requirement of the plain-error test is not satisfied. But that would not cause us to reach a different conclusion with respect to the plain-error test as a whole. Wright Hennepin has not established reversible error either because it has failed to satisfy the third and fourth requirements of the plain-error test or because it has failed to satisfy the second, third, and fourth requirements.

with their exclusive possession. The jury answered all three of these interrogatories in the affirmative. But the jury did not make three awards of damages for these three theories. In response to the eighth interrogatory, the jury made two awards; it awarded damages of \$648,200 for “Negligence and/or Trespass” and damages of \$105,000 for “Nuisance.”

In a civil case, a plain error may affect substantial rights if the error has a significant effect on the amount of damages awarded by the jury. The jury’s special verdict form, by itself, does not establish that the submission of the trespass claim affected Wright Hennepin’s substantial rights. There is no apparent reason to believe that the jury would have awarded a lesser amount of damages if the trespass claim had not been submitted. Considering the language used in the eighth interrogatory, the jury might have awarded all the damages in the first damages award for negligence and nothing for trespass. In fact, that scenario appears likely. On the whole, the parties tried a negligence case. The Popplers’ evidence was focused on Wright Hennepin’s negligent conduct, specifically, its failure to prevent stray voltage from running through the Popplers’ dairy farm. The Popplers essentially claimed that stray voltage interfered with their use and enjoyment of the dairy farm. Their damages expert, Dr. Behr, testified that the Popplers’ dairy farm continued to operate during the existence of stray voltage but suffered financial losses. The nature of the Popplers’ injury and damages suggest a need to compensate them for negligence, not for trespass. In fact, in closing arguments, the Popplers’ counsel focused almost entirely on the negligence claim, referring to the trespass claim only twice, and only briefly. Considering the totality of the circumstances,

we do not believe that the result of the trial would have been any different if the district court had not submitted the trespass claim to the jury.

Thus, Wright Hennepin cannot establish that the district court's plain error in submitting the trespass claim affected its substantial rights. Accordingly, Wright Hennepin cannot satisfy the third requirement of the plain-error test.

4. *Fairness and Integrity*

We next consider the fourth requirement of the plain-error test, whether the error affected the ““fairness and the integrity of the judicial proceedings.”” *Frazier*, 811 N.W.2d at 826-27 (citing *Griller*, 583 N.W.2d at 740).

In *Frazier*, the supreme court concluded that an erroneous jury instruction did not require a new trial because the fourth requirement of the plain-error test was not satisfied. *Id.* at 628. The supreme court was concerned that the appellant had allowed the case to be submitted to the jury on one theory but had reserved another theory for a possible appeal. *Id.* The supreme court further noted that the defendant challenged the plaintiff's allegedly erroneous theory in a post-trial motion shortly after failing to object to the jury instructions. *Id.* The supreme court reasoned that granting a new trial would “not accord with notions of fairness or ensure integrity in judicial proceedings” and, in fact, “would adversely impact the integrity of the judicial proceedings.” *Id.*

Similarly, in this case, the case was tried on two theories to which Wright Hennepin did not object: negligence and nuisance. A third theory, trespass, also was submitted, but it was no more than an incidental part of the trial. The jury's verdict with respect to damages appears to be unaffected by the presence of the trespass claim. In

these circumstances, we do not believe that a new trial is necessary “to ensure fairness and the integrity of the judicial proceedings.” *Id.* Furthermore, we believe that granting a new trial “would adversely impact the integrity of the judicial proceedings.” *Id.* Accordingly, the fourth requirement of the plain-error test is not satisfied.

D E C I S I O N

The district court did not err by denying Wright Hennepin’s post-trial motion for a new trial due to the admission of the Popplers’ expert evidence, by denying Wright Hennepin’s post-trial motion for judgment as a matter of law on the sufficiency of the evidence of causation, or by denying the Popplers’ motion for an award of treble damages. Also, the district court did not commit reversible error by submitting the Popplers’ trespass claim to the jury.

The district court erred by amending the jury’s verdict on the issue of damages and by denying Wright Hennepin’s post-trial motion for judgment as a matter of law or a new trial because of the insufficiency of the evidence of lost profits.

Therefore, we affirm in part, reverse in part, and remand for a new trial on the issue of damages.

Affirmed in part, reversed in part, and remanded.